

Appendices

Appendix 1 TQM Implementation Instrument

A 5-Likert scale (1: Strongly disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly agree) was used to ask the respondents to state how much they agreed with these statements.

Scale 1: Leadership

- (1) Top management actively participates in quality management activities.
- (2) Top management learns quality-related concepts and skills.
- (3) Top management strongly encourages employee involvement in quality management activities.
- (4) Top management empowers employees to solve quality problems.
- (5) Top management arranges adequate resources for employee education and training.
- (6) Top management discusses many quality-related issues in top management meetings.
- (7) Top management focuses on product quality rather than yields.
- (8) Top management pursues long-term business success.

Scale 2: Supplier Quality Management

- (1) Our firm has established long-term cooperative relations with suppliers.
- (2) Our firm regards product quality as the most important factor in selecting suppliers.
- (3) Our firm always participates in supplier activities related to quality.
- (4) Our firm always gives feedback on the performance of suppliers' products.
- (5) Our firm has detailed information about supplier performance.
- (6) Our firm regularly conducts supplier quality audit.

Scale 3: Vision and Plan Statement

- (1) Our firm has a clear long-term vision statement.
- (2) The vision effectively encourages employees' commitment to quality management.
- (3) Our firm has a clear short-term business performance plan.
- (4) Our firm has a clear quality policy.
- (5) Our firm has a detailed quality goal.
- (6) Our firm has effective quality improvement plans.
- (7) Various policies and plans are well communicated to the employees.
- (8) Employees from different levels are involved in making policies and plans.

Scale 4: Evaluation

- (1) Our firm regularly audits various business strategies.
- (2) Our firm regularly conducts quality audits.
- (3) Benchmarking is used extensively in our firm.
- (4) Our firm uses quality-related costs extensively.
- (5)* *Our firm has detailed quality-related data such as defect rates and scraps.*

- (6)* *Quality-related data are used to evaluate the management of our firm.*
- (7)* *Quality-related data are used to evaluate the performance of all departments.*
- (8)* *Quality-related data are used to evaluate the performance of employees.*
- (9) Quality-related information is displayed at the shop floor.
- (10) The aim of evaluation is improvement, not criticism.

Scale 5: Process Control and Improvement

- (1) Our firm is kept neat and clean at all times.
- (2) Process capability can meet production requirements.
- (3) Production equipment is well maintained according to the maintenance plan.
- (4) Our firm implements various inspections effectively (e.g., incoming, process, and final products).
- (5)[#] *Our processes are designed to be “foolproof” in order to minimize the chance of employee error.*
- (6)* *Our firm uses the Seven QC tools extensively for process control and improvement.*
- (7)* *Our firm uses SPC extensively for process control and improvement.*
- (8)* *Our firm uses PDCA cycle extensively for process control and improvement.*

Scale 6: Product Design

- (1) The design engineers are required to have some shop floor experience.
- (2) The design engineers are required to have some marketing experience.
- (3) The customer requirements are thoroughly considered in new product design.
- (4) Various departments participate in new product development.
- (5) New product designs are thoroughly reviewed before production.
- (6) Cost is emphasized in the product design process.
- (7) Experimental design is used extensively in product design.
- (8) Quality function deployment (QFD) is used extensively in product design.

Scale 7: Quality System Improvement

- (1) The quality system in our firm is continuously being improved.
- (2) Our firm uses ISO 9000 as a guideline for establishing our quality system.
- (3) Our firm has a clear quality manual.
- (4) Our firm has clear procedure documents.
- (5) Our firm has clear working instructions.

Scale 8: Employee Participation

- (1) Our firm has cross-functional teams.
- (2) Our firm has several QC circles (within one function).
- (3) Employees are actively involved in quality-related activities.
- (4) Our firm implements suggestion activities extensively.
- (5) Most employees' suggestions are implemented after an evaluation.
- (6) Employees are very committed to the success of our firm.
- (7) Employees are encouraged to fix problems they find.
- (8) Reporting work problems is encouraged in our firm.

Scale 9: Recognition and Reward

- (1) Our firm improves working conditions in order to recognize employee quality

management efforts.

- (2) Our firm has a salary promotion scheme to encourage employee participation in quality management.
- (3) Position promotions are based on work quality in our firm.
- (4) Excellent suggestions are financially rewarded.
- (5) Employees' rewards and penalties are clear.
- (6) Recognition and reward activities effectively stimulate employee commitment to quality management.

Scale 10: Education and Training

- (1) Employees are encouraged to accept education and training in our firm.
- (2) Resources are available for employee education and training in our firm.
- (3) Most employees in our firm are trained on how to use quality management methods (tools).
- (4) Quality awareness education is given to employees.
- (5) Specific work-skills training is given to all employees.
- (6) Employees are regarded as valuable, long-term resources worthy of receiving education and training throughout their career.

Scale 11: Customer Focus

- (1) Our firm collects extensive complaint information from customers.
- (2) Quality-related customer complaints are treated with top priority.
- (3) Our firm conducts a customer satisfaction survey every year.
- (4) Our firm always conducts market research in order to collect suggestions for improving our products.
- (5) Our firm provides warranty on our sold products to customers.
- (6) Our firm has been customer focused for a long time.

Notes: # means that this item was deleted after factor analysis.
 * means that these items in that scale formed one factor and the other items in that scale formed another.

Appendix 2 Overall Business Performance Instrument

Scale 1: Employee Satisfaction

Please state the perceived overall employee satisfaction level in your firm (Choose a number between “0” and “10” to 1 decimal place. 0: Extremely unsatisfied; 5.0: Middle; 1.0: Extremely satisfied).

- (1) The employee satisfaction level in your firm

Scale 2: Product Quality

Compared with the other firms within the same industry in China, please state the situation of your primary products (1: Worst in the industry; 2: Below average; 3: Average; 4: Above average; 5: Best in the industry).

- (1) The performance of your primary products
(2) The conformity rates of your primary products
(3) The reliability of your primary products
(4) The durability of your primary products
(5)* *The defect rates of your primary products*
(6)* *The internal failure costs as a percentage of annual output value*
(7)* *The external failure costs as a percentage of annual sales*

Scale 3: Customer Satisfaction

Please state the customer satisfaction level for your firm (1: Extremely unsatisfied; 2: Unsatisfied; 3: Middle; 4: Satisfied; 5: Extremely satisfied).

- (1) The customer satisfaction level for product quality provided by your firm
(2) The customer satisfaction level for service quality provided by your firm

Scale 4: Strategic Business Performance

1. What were the approximate annual sales achieved by your firm in the last financial year (Unit million RMB)?

- (1) Less than 13 (2) 13.1 - 22 (3) 22.1 - 50
(4) 50.1 - 150 (5) More than 150

2*. *Compared with the previous year, do you think your annual sales:*

- (1) *Decreased a great deal* (2) *Decreased slightly* (3) *Stayed almost the same*
(4) *Increased slightly* (5) *Increased a great deal*

3*. *Do you think your firm was:*

- (1) *Losing money badly* (2) *Losing money slightly* (3) *Breaking even*
(4) *Making some profits* (5) *Very profitable*

4. Compared with the firm that had the biggest local market share (regarded as 100%) within the same industry in China, what was the relative local market share of your products (your firm's output divided by the output of the biggest firm in the same industrial sector in China)?

- (1) 0% - 20.0% (2) 20.1% - 40% (3) 40.1% - 60%
(4) 60.1% - 80% (5) 80.1% - 100%

5. Approximately what percentage of total annual sales by value was exported?

- (1) 0% (2) 0.1% - 8% (3) 8.1% - 14%
(4) 14.1% - 35% (5) More than 35%

Note: ** means that these items in that scale formed one factor, and the other items in that scale formed another.*

Appendix 3 Frequency Distributions and Means of Respondents' Responses to Measurement Items

Table A Items Measuring TQM Implementation Constructs

Scales	Items	Means	Response category					Total
			1	2	3	4	5	
Leadership (Scale 1)								
	1	4.03	3	10	34	95	70	212
	2	3.57	4	32	59	73	44	212
	3	4.22	0	3	33	90	86	212
	4	3.61	6	24	57	85	40	212
	5	3.50	8	34	63	59	48	212
	6	4.32	0	2	21	97	92	212
	7	4.03	0	3	49	99	61	212
	8	3.95	3	12	55	65	77	212
Supplier quality management (Scale 2)								
	1	3.64	2	19	68	87	36	212
	2	4.16	1	4	31	100	76	212
	3	3.03	14	52	72	62	12	212
	4	4.08	0	6	43	90	73	212
	5	3.64	2	20	65	91	34	212
	6	3.53	2	36	60	76	38	212
Vision and plan statement (Scale 3)								
	1	3.96	2	12	52	72	74	212
	2	3.55	6	24	67	77	38	212
	3	4.19	1	5	28	97	81	212
	4	4.22	1	2	37	82	90	212
	5	4.04	2	13	42	73	82	212
	6	3.70	1	27	50	91	43	212
	7	3.92	2	13	44	93	60	212
	8	3.03	22	45	69	57	19	212
Evaluation (Scale 4)								
	1	3.47	5	26	73	81	27	212
	2	3.82	2	30	37	79	64	212
	3	3.60	8	29	56	66	53	212
	4	3.51	2	26	73	84	27	212
	5	4.20	0	3	38	84	87	212
	6	3.83	0	7	65	97	43	212
	7	3.66	0	18	72	87	35	212
	8	3.72	0	8	78	91	35	212
	9	3.17	13	39	79	61	20	212
	10	3.85	4	8	55	94	51	212

Continued

Scales	Items	Means	Response category					Total
			1	2	3	4	5	
Process control								
and improvement (Scale 5)	1	3.81	2	11	62	87	50	212
	2	3.98	0	8	41	110	53	212
	3	3.95	1	9	52	87	63	212
	4	4.24	0	6	30	84	92	212
	5#	2.83	22	54	82	45	9	212
	6	3.33	6	28	86	73	19	212
	7	2.95	22	39	94	41	16	212
	8	3.43	5	20	88	76	23	212
Product design (Scale 6)								
	1	4.02	0	6	43	104	59	212
	2	3.97	0	9	43	105	55	212
	3	4.23	0	3	26	102	81	212
	4	2.96	15	55	80	48	14	212
	5	3.89	0	7	59	96	50	212
	6	3.96	0	4	50	108	50	212
	7	3.11	17	45	65	67	18	212
	8	2.93	22	46	82	48	14	212
Quality system improvement (Scale 7)								
	1	3.94	0	12	55	78	67	212
	2	3.55	14	36	47	49	66	212
	3	3.61	23	19	45	55	70	212
	4	3.70	8	25	55	59	65	212
	5	3.86	3	18	48	79	64	212
Employee participation (Scale 8)								
	1	3.33	8	30	79	75	20	212
	2	3.47	8	30	63	76	35	212
	3	3.63	0	17	80	80	35	212
	4	4.05	0	4	50	89	69	212
	5	3.61	0	13	83	89	27	212
	6	3.71	1	19	62	89	41	212
	7	3.88	0	9	56	99	48	212
	8	3.76	1	10	62	104	35	212
Recognition and reward (Scale 9)								
	1	3.82	0	15	56	93	48	212
	2	3.62	4	19	68	84	37	212
	3	3.44	3	31	77	71	30	212
	4	3.84	0	10	59	97	46	212
	5	3.94	0	9	59	80	64	212
	6	3.51	1	25	78	81	27	212

Continued

Scales	Items	Means	Response category					Total
			1	2	3	4	5	
Education								
and	1	3.83	0	14	52	101	45	212
training	2	3.36	1	52	55	77	27	212
(Scale 10)	3	3.37	0	39	77	75	21	212
	4	4.00	0	6	53	89	64	212
	5	4.07	0	0	39	119	54	212
	6	3.42	6	33	63	86	24	212
Customer								
focus	1	3.82	0	10	58	104	40	212
(Scale 11)	2	4.18	0	4	25	111	72	212
	3	3.65	3	21	70	71	47	212
	4	3.80	2	18	49	94	49	212
	5	4.44	0	2	14	84	112	212
	6	4.09	0	8	39	91	74	212

Notes: # means that this item was deleted after the factor analysis.
The item order in this table is the same as in the instrument.

Table B Items Measuring Overall Business Performance

Scales	Items	Means	Response category					Total
			1	2	3	4	5	
Employee satisfaction (Scale 1)	1	7.51	--	--	--	--	--	212
Product quality performance (Scale 2)	1	3.97	2	10	46	89	65	212
	2	3.99	1	9	50	84	68	212
	3	4.02	1	5	44	100	62	212
	4	4.01	0	7	46	97	62	212
	5	3.61	4	20	71	76	41	212
	6	3.57	3	19	79	76	35	212
	7	3.61	3	20	73	77	39	212
Customer Satisfaction (Scale 3)	1	3.97	1	6	40	116	49	212
	2	4.11	1	7	34	95	75	212
Strategic business performance (Scale 4)	1	3.00	47	38	41	40	46	212
	2	2.96	48	47	16	67	34	212
	3	3.16	43	27	18	101	23	212
	4	2.30	98	36	23	26	29	212
	5	2.20	110	26	25	25	26	212

Notes: Scale 1 was ranged between 0 and 10 to 1 decimal place. The mean is 7.51; the minimum value is 0.5 (one time); the maximum value is 10.0 (23 times). The item order in this table is the same as in the instrument.

Appendix 4 Item to Scale Correlation Matrix for the Eleven TQM Implementation Scales (Pearson Correlation)

Scales	Item	Scales										
		1	2	3	4	5	6	7	8	9	10	11
1	1	.784	.581	.631	.587	.555	.560	.525	.559	.466	.540	.538
	2	.810	.543	.685	.572	.541	.559	.554	.600	.458	.588	.583
	3	.709	.548	.577	.566	.536	.462	.378	.551	.509	.539	.491
	4	.702	.465	.583	.494	.463	.587	.478	.530	.404	.512	.484
	5	.851	.665	.703	.637	.622	.647	.596	.645	.523	.694	.596
	6	.624	.485	.485	.514	.445	.409	.365	.446	.472	.483	.490
	7	.751	.586	.603	.602	.563	.505	.433	.542	.534	.560	.515
	8	.816	.673	.695	.637	.623	.567	.576	.650	.612	.626	.661
2	1	.677	.741	.678	.583	.589	.603	.645	.650	.483	.615	.622
	2	.585	.787	.598	.598	.591	.483	.524	.509	.568	.527	.571
	3	.721	.816	.764	.674	.620	.635	.661	.657	.566	.658	.624
	4	.517	.690	.548	.581	.556	.404	.407	.493	.494	.526	.512
	5	.391	.683	.460	.533	.532	.344	.453	.480	.528	.474	.443
	6	.453	.753	.524	.554	.472	.396	.442	.435	.515	.465	.415
3	1	.738	.694	.844	.722	.716	.649	.662	.696	.644	.722	.731
	2	.724	.685	.861	.704	.674	.631	.633	.676	.613	.682	.665
	3	.427	.432	.553	.443	.383	.391	.353	.399	.436	.459	.442
	4	.693	.720	.861	.759	.738	.669	.756	.722	.644	.731	.698
	5	.724	.669	.859	.708	.689	.673	.763	.698	.556	.671	.662
	6	.748	.712	.863	.752	.693	.703	.722	.726	.620	.695	.691
	7	.476	.576	.652	.597	.502	.446	.422	.519	.538	.549	.512
	8	.663	.592	.823	.706	.599	.658	.622	.669	.585	.625	.598
4	1	.579	.607	.659	.741	.618	.549	.564	.577	.573	.609	.557
	2	.536	.644	.611	.738	.601	.500	.609	.525	.527	.597	.517
	3	.663	.615	.729	.768	.708	.642	.594	.690	.553	.634	.676
	4	.527	.545	.616	.703	.615	.564	.490	.553	.590	.551	.530
	5	.437	.542	.508	.656	.518	.469	.479	.467	.449	.521	.472
	6	.557	.548	.597	.772	.594	.536	.482	.628	.631	.555	.528
	7	.524	.537	.596	.769	.540	.561	.445	.603	.569	.544	.540
	8	.416	.433	.425	.627	.431	.395	.334	.467	.499	.419	.397
	9	.506	.490	.612	.653	.544	.588	.502	.600	.485	.515	.524
	10	.604	.622	.664	.692	.636	.599	.559	.650	.532	.578	.587
5	1	.580	.599	.621	.621	.725	.593	.530	.586	.566	.636	.581
	2	.455	.474	.496	.562	.666	.492	.389	.463	.557	.484	.405
	3	.510	.619	.592	.623	.755	.565	.508	.585	.552	.587	.555
	4	.570	.570	.630	.626	.713	.548	.583	.596	.536	.622	.565
	5	.643	.644	.709	.667	.800	.676	.679	.671	.591	.674	.656
	6	.475	.530	.536	.593	.754	.547	.553	.597	.542	.529	.532
	7	.535	.505	.600	.602	.790	.654	.584	.641	.500	.575	.530
	8	.479	.508	.491	.590	.721	.497	.564	.625	.563	.569	.580

Continued

6	1	.515	.403	.529	.510	.518	.688	.447	.437	.401	.488	.484
	2	.424	.371	.460	.492	.478	.649	.353	.418	.403	.400	.433
	3	.414	.392	.455	.462	.453	.642	.461	.449	.437	.370	.457
	4	.520	.448	.610	.588	.532	.726	.491	.588	.504	.508	.508
	5	.538	.564	.578	.621	.599	.636	.480	.590	.576	.572	.563
	6	.361	.385	.352	.438	.436	.570	.232	.425	.418	.358	.311
	7	.586	.505	.621	.578	.633	.802	.552	.611	.489	.560	.563
	8	.554	.471	.564	.519	.592	.765	.563	.582	.448	.542	.488
7	1	.621	.674	.690	.710	.715	.650	.782	.696	.616	.700	.691
	2	.565	.621	.681	.623	.661	.544	.913	.637	.554	.648	.630
	3	.564	.591	.679	.590	.616	.572	.914	.574	.461	.625	.598
	4	.608	.658	.741	.667	.662	.614	.939	.652	.538	.677	.651
	5	.548	.581	.666	.613	.660	.561	.844	.638	.564	.637	.588
8	1	.654	.636	.730	.671	.672	.645	.695	.765	.561	.654	.647
	2	.562	.491	.601	.548	.628	.597	.663	.760	.495	.599	.612
	3	.607	.527	.652	.616	.652	.577	.549	.804	.575	.663	.614
	4	.502	.494	.501	.573	.534	.478	.367	.698	.621	.539	.493
	5	.556	.544	.591	.584	.562	.521	.494	.741	.605	.667	.679
	6	.591	.553	.639	.653	.626	.606	.546	.777	.602	.646	.639
	7	.379	.438	.446	.542	.466	.456	.373	.639	.615	.487	.476
	8	.589	.618	.629	.657	.638	.574	.514	.761	.666	.646	.611
9	1	.637	.672	.696	.691	.706	.612	.577	.697	.756	.710	.663
	2	.310	.455	.381	.456	.420	.354	.325	.419	.718	.404	.371
	3	.528	.529	.608	.630	.616	.580	.517	.621	.801	.592	.588
	4	.495	.560	.522	.571	.548	.498	.444	.625	.766	.569	.537
	5	.410	.455	.481	.506	.487	.411	.360	.560	.745	.590	.565
	6	.613	.569	.673	.625	.619	.600	.581	.713	.800	.652	.670
10	1	.636	.663	.666	.672	.661	.536	.566	.673	.672	.828	.669
	2	.736	.642	.736	.650	.673	.639	.689	.736	.623	.863	.695
	3	.652	.653	.714	.706	.710	.650	.697	.713	.619	.846	.690
	4	.374	.452	.443	.498	.454	.368	.371	.488	.561	.680	.509
	5	.433	.456	.479	.500	.536	.419	.436	.542	.538	.703	.530
	6	.707	.610	.782	.685	.716	.670	.720	.757	.646	.854	.783
11	1	.600	.543	.702	.638	.574	.561	.563	.650	.594	.686	.813
	2	.505	.519	.507	.571	.561	.522	.474	.561	.511	.574	.737
	3	.643	.653	.685	.664	.677	.619	.681	.734	.667	.745	.838
	4	.610	.623	.689	.685	.722	.660	.613	.723	.664	.675	.849
	5	.380	.394	.413	.400	.363	.310	.352	.404	.437	.490	.649
	6	.618	.576	.677	.560	.556	.547	.608	.658	.566	.645	.813

Appendix 5 Assessment Tools for TQM Implementation Practices and Overall Business Performance

1. Assessment Tool for TQM Implementation

This assessment tool can be used to assess TQM implementation in a firm. The first column lists the TQM implementation practices. The second column lists the addressed area(s) for each practice. These specifically addressed areas are presented in the form of positive statements. Thus, a user can rate the firm's TQM implementation practices using a score between "0" and "10". The number "0" means that the firm is extremely weak in this practice, while the "10" indicates that the firm is extremely strong. In order to help the user in rating each TQM implementation practice, scoring guidelines were developed on the basis of the European Model for Total Quality Management (1994) and the American Malcolm Baldrige National Quality Award (1999). Scoring results are listed in the third column. Lower scored practices (e.g., lower than or equal to 5) should be given more attention by the firm. During the process of assessment, the strengths and weaknesses of addressed areas should be pointed out. If the firm is neither strong nor weak in an addressed area, "Average" should be indicated. The strengths and weaknesses are listed in the fourth column. The weak areas of the firm's TQM implementation can be used by the firm to formulate improvement plans. If some TQM implementation practices are not applicable (e.g., the firm does not have product design activities), "Not applicable" should be indicated in the "Scores" column. It should be noted that scoring each TQM practice should be based on evidence rather than imagination.

Note that all information in the columns "Scores" and "Strengths and Weaknesses" is the evaluation result of the case firm's TQM implementation.

Scoring Guidelines for TQM Implementation

Scores	Criterion
0	- No evidence is available.
1-2	- Little required evidence is available; - A systematic approach to the basic purposes of the practice is just beginning; - Huge gaps exist in deployment, which inhibits progress in achieving the basic purposes of the practice.
3-4	- Some required evidence is available; - A systematic approach to the basic purposes of the practice has been in use for some time; - Some areas are in the early stage of deployment.
5-6	- Much required evidence is available; - An approach is soundly based and systematic, which is responsive to the overall purposes of the practice; - The approach is developed, although deployment may vary in some areas.
7-8	- All required evidence is available; - An approach is soundly based and systematic, which is responsive to the multiple requirements of the practice; - The approach is well deployed without significant gaps.
9-10	- A sound, systematic approach, fully responsive to all the requirements of the practice is fully developed; - The approach is fully deployed without significant weaknesses in any area.

Notes: Approach refers to how a firm addresses the practice requirement(s) – the method(s) used.

Deployment refers to the extent to which a firm's approach is applied to all requirements of the practice (Malcolm Baldrige National Quality Award, 1999).

Leadership

TQM Implementation Practices	Addressed Areas	Scores	Strengths and Weaknesses
Top management commitment	<ul style="list-style-type: none"> - Pursue continuous improvement in all business activities; - Demonstrate constant commitment to the vision statement; - Demonstrate commitment to quality through actions rather than words; - Establish an organization-wide quality culture. 	6	<p>Strong</p> <p>Average</p> <p>Average</p> <p>Average</p>
Top management participation	<ul style="list-style-type: none"> - Lead TQM implementation standing from the front; - Participate in TQM implementation personally; - Communicate with and listen to employees; - Participate in assessing TQM implementation progress. 	8	<p>Strong</p> <p>Strong</p> <p>Average</p> <p>Strong</p>
Top management learning	<ul style="list-style-type: none"> - Accept education and training in management knowledge; - Give training lectures to employees; - Be modest enough to learn from employees. 	6	<p>Strong</p> <p>Average</p> <p>Average</p>
Top management empowerment	<ul style="list-style-type: none"> - Empower employees to solve quality problems; - Empower employees to make some urgent decisions; - Manage the firm in a humanistic manner. 	3	<p>Weak</p> <p>Weak</p> <p>Average</p>
Top management encouragement	<ul style="list-style-type: none"> - Encourage employee involvement in quality management activities; - Attach great importance to employees' suggestions; - Show more enthusiasm about TQM implementation; - Trust employees and believe that they can do things better; - Encourage employees to list the firm's shortcomings. 	7	<p>Strong</p> <p>Strong</p> <p>Strong</p> <p>Average</p> <p>Strong</p>
Top management's role model	<ul style="list-style-type: none"> - Act as role models leading by examples; - Handle matters impartially; - Observe the firm's various rules and regulations. 	7	<p>Strong</p> <p>Strong</p> <p>Strong</p>
Pursuit of long-term business success	<ul style="list-style-type: none"> - Focus on quality of products and services rather than yields; - Pursue long-term overall business performance. 	4	<p>Average</p> <p>Weak</p>
Management by fact	<ul style="list-style-type: none"> - Make decisions based on facts rather than by imagination; - Use various pieces of information for decision-making. 	6	<p>Strong</p> <p>Strong</p>

Supplier Quality Management

TQM Implementation Practices	Addressed Areas	Scores	Strengths and Weaknesses
Partnership with suppliers	<ul style="list-style-type: none"> - Work together with suppliers for mutual benefits; - Pursue long-term stable business relationships with suppliers; - Treat suppliers as partners rather than adversaries. 	3	Weak Weak Weak
Supplier selection criteria	<ul style="list-style-type: none"> - Obtain sufficient information about suppliers or potential suppliers; - Understand suppliers' facilities and production capabilities; - Select supplier based on the quality of products and services rather than price alone. 	5	Strong Strong Weak
Participation in suppliers	<ul style="list-style-type: none"> - Provide training for suppliers; - Participate in supplier quality improvement projects. 	6	Average Average
Supplier performance evaluation	<ul style="list-style-type: none"> - Evaluate the performance of products and services from suppliers; - Feed back the performance of products and services to suppliers; - Rate suppliers in terms of product quality and service quality; - Have supplier performance evaluation system for measuring suppliers' performance. 	7	Strong Strong Strong Strong
Supplier quality audit	<ul style="list-style-type: none"> - Conduct supplier quality audits regularly; - Audit suppliers' quality of products and services and quality management systems; - Audit suppliers' manufacturing facilities. 	7	Strong Strong Strong
Supplier communication	<ul style="list-style-type: none"> - Inform suppliers of any change in design and/or production immediately; - Establish multiple channels of communication with suppliers. 	8	Strong Strong

Vision and Plan Statement

TQM Implementation Practices	Addressed Areas	Scores	Strengths and Weaknesses
Vision statement	<ul style="list-style-type: none"> - Have a long-term vision statement; - Communicate the vision statement to employees; - Use the vision statement as a guide to formulate business strategies. 	4	Weak Weak Weak
Quality policy	<ul style="list-style-type: none"> - Have a written quality policy; - Communicate the quality policy to employees; - Use the quality policy as a guide to formulate quality goals. 	6	Strong Strong Strong
Overall business performance plan	<ul style="list-style-type: none"> - Have a long-term overall business performance plan; - Have an annual overall business performance plan; - Set up a realistic overall business performance plan scientifically. 	5	Weak Average Average
Product quality goal	<ul style="list-style-type: none"> - Have the goal of product performance, reliability, and durability; - Have the goal of conformity rate and internal defect rate; - Have the goal of internal losses; - Have the goal of external losses; - Establish realistic quality goal indices scientifically. 	6	Average Strong Strong Strong Average
Quality improvement plan	<ul style="list-style-type: none"> - Formulate a quality improvement plan to target major problem areas; - Implement the quality improvement plan in practice. 	5	Strong Weak
Formulation of vision and plan	<ul style="list-style-type: none"> - Formulate the vision and plans in a holistic and cross-functional approach; - Use sufficient information to formulate the vision and plans; - Formulate the vision and plans by employees from different levels; - Make the vision, plans, and practices in a consistent manner. 	6	Average Average Average Average

Evaluation

TQM Implementation Practices	Addressed Areas	Scores	Strengths and Weaknesses
Evaluation of strategy	<ul style="list-style-type: none"> - Evaluate strategies at different levels; - Adjust strategies on the basis of the evaluation. 	8	Strong Strong
Evaluation of overall business performance	<ul style="list-style-type: none"> - Have data on employee satisfaction and evaluate employee satisfaction; - Have data on product quality and evaluate product quality; - Have data on customer satisfaction and evaluate customer satisfaction; - Have data on strategic business performance and evaluate strategic business performance; - Formulate improvement actions on the basis of evaluations. 	5	Weak Strong Strong Strong Average
Evaluation of departments' performance	<ul style="list-style-type: none"> - Have performance criteria for different departments; - Evaluate departments' performance regularly; - Use evaluation results for improvement, recognition, and reward. 	7	Strong Strong Strong
Evaluation of employee performance	<ul style="list-style-type: none"> - Have performance criteria for different employees; - Evaluate employee performance against set targets; - Use evaluation results for employees' education and training, recognition and reward. 	8	Strong Strong Strong
Quality audit	<ul style="list-style-type: none"> - Conduct quality audits regularly; - Identify problem areas and formulate action plans. 	8	Strong Strong
Benchmarking	<ul style="list-style-type: none"> - Have relevant information from competitors and best-in-class organizations; - Benchmark the competitors; - Benchmark the best-in-class firms; - Formulate improvement actions on the basis of benchmarking. 	5	Average Weak Average Average
Quality costs	<ul style="list-style-type: none"> - Have data on internal failure costs; - Have data on external failure costs; - Have data on appraisal costs; - Have data on prevention costs; - Use such information to formulate improvement actions. 	5	Strong Strong Weak Weak Average
Information system	<ul style="list-style-type: none"> - Have a computer-based integrated information system; - Have sufficient information in the system; - Share information among different departments; - Use the information system extensively for various business activities. 	4	Weak Average Average Average

Process Control and Improvement

TQM Implementation Practices	Addressed Areas	Scores	Strengths and Weaknesses
Shop floor control	<ul style="list-style-type: none"> - Keep the shop floor neat and clean at all times; - Assign employees the responsibility of cleaning their own working areas; - Determine an appropriate temperature range and lighting intensity; - Reduce noise level and improve air quality. 	5	<p>Strong Strong</p> <p>Weak</p> <p>Weak</p>
Process capability	<ul style="list-style-type: none"> - Calculate a process capability index; - Control and improve process capability; - Use the process capability index for setting realistic specification limits. 	2	<p>Weak</p> <p>Weak</p> <p>Weak</p>
Equipment maintenance and innovation	<ul style="list-style-type: none"> - Have equipment maintenance and innovation plan; - Conduct breakdown equipment maintenance; - Conduct preventive equipment maintenance; - Assign employees the responsibility for daily equipment maintenance; - Innovate production equipment to meet production requirements. 	5	<p>Strong</p> <p>Strong</p> <p>Weak</p> <p>Strong</p> <p>Weak</p>
Inventory management	<ul style="list-style-type: none"> - Keep the amounts of inventories as low as possible; - Keep the warehouse neat and keep inventories in good order. 	7	<p>Strong</p> <p>Strong</p>
Inspection	<ul style="list-style-type: none"> - Conduct effective incoming, in-process, and final inspection; - Assign employees responsibilities to perform self-inspection; - Conduct sampling inspection; - Use inspection information to seek quality improvement; - Try to reduce various inspection activities. 	5	<p>Strong</p> <p>Strong</p> <p>Strong</p> <p>Average</p> <p>Weak</p>
Use of quality tools	<ul style="list-style-type: none"> - Use the PDCA cycle extensively, for different activities; - Use the seven QC tools extensively; - Use the seven new QC tools extensively; - Use statistical process control extensively. 	4	<p>Average</p> <p>Weak</p> <p>Weak</p> <p>Weak</p>

Product Design

TQM Implementation Practices	Addressed Areas	Scores	Strengths and Weaknesses
Concurrent engineering	<ul style="list-style-type: none"> - Establish cooperative relationships during the whole product design process; - Design products through cooperation among people from various functional departments, suppliers, or customers. 	4	Weak Weak
Reliability engineering	<ul style="list-style-type: none"> - Set overall reliability goals; - Identify critical parts and causes of failures; - Determine solutions for increasing failure resistance. 	6	Average Average Average
Designing for manufacturability	<ul style="list-style-type: none"> - Simplify a design by reducing total number of parts; - Make parts more producible; - Focus on modular designs. 	5	Strong Average Weak
Design of experiments	<ul style="list-style-type: none"> - Use experimental design extensively for new product development. 	0	Weak
Quality function deployment	<ul style="list-style-type: none"> - Have sufficient information on customer needs and expectations; - Prioritize customer needs and expectations for product design; - Transfer customer needs and expectations into product specifications. 	6	Average Average Strong
Value engineering	<ul style="list-style-type: none"> - Analyze the contribution of different parts to product quality; - Reduce product costs without decreasing product quality. 	8	Strong Strong
Computer-aided design	<ul style="list-style-type: none"> - Design a new product with the help of a computer. 	8	Strong

Quality System Improvement

TQM Implementation Practices	Addressed Areas	Scores	Strengths and Weaknesses
Quality manual	<ul style="list-style-type: none"> - Have a quality manual; - Formulate the quality manual by people from different departments; - Get the quality manual approved by the general manager. 	8	<p>Strong</p> <p>Strong</p> <p>Strong</p>
Quality system procedures	<ul style="list-style-type: none"> - Define responsibilities and authorities of different functional departments; - Solve the interface issues among different departments; - Draw up quality system procedures by people from different departments. 	7	<p>Strong</p> <p>Strong</p> <p>Strong</p>
Work instructions	<ul style="list-style-type: none"> - Integrate existing work documents into work instructions; - Draw up various work instructions referring to procedures; - Formulate work instructions by people from different departments. 	7	<p>Strong</p> <p>Strong</p> <p>Strong</p>
ISO 9000 certification	<ul style="list-style-type: none"> - Implement all quality system documents in practice; - Modify quality system documents through quality audits and management review; - Select a registration body for ISO 9000 certification; - Improve quality system documents continuously. 	5	<p>Weak</p> <p>Strong</p> <p>Strong</p> <p>Strong</p>

Employee Participation

TQM Implementation Practices	Addressed Areas	Scores	Strengths and Weaknesses
Cross-functional team	<ul style="list-style-type: none"> - Have some cross-functional teams; - Choose team members according to their potential contributions; - Use cross-functional teams to effectively solve cross-functional problems. 	8	Strong Strong Strong
Quality control (QC) circle	<ul style="list-style-type: none"> - Have some QC circles; - Encourage employees to participate in QC circles; - Evaluate the effects of QC circles. 	0	Weak Weak Weak
Within-functional team	<ul style="list-style-type: none"> - Have some within-functional teams; - Choose team members according to their potential contributions; - Evaluate the effects of within-functional teams. 	8	Strong Strong Strong
Information communication	<ul style="list-style-type: none"> - Provide sufficient information to employees by means of regular meetings, posters, newsletters, videos, and broadcasting; - Have effective information communication among different departments; - Stimulate mutual communication among people at different levels. 	7	Strong Strong Average
Employee suggestions	<ul style="list-style-type: none"> - Have effective employee suggestion systems; - Encourage employees to submit suggestions; - Evaluate employee suggestions promptly; - Feed back evaluation results to suggestion providers; - Implement some employee suggestions after evaluation; - Provide recognition and reward for employee suggestions. 	8	Strong Strong Strong Average Average Strong
Improving employee commitment	<ul style="list-style-type: none"> - Care for employees in job- and career-related development; - Respect and trust employees; - Encourage employees to report their own working problems. 	4	Average Average Weak
Job rotation	<ul style="list-style-type: none"> - Rotate employee jobs regularly; - Establish internal partnerships between employees. 	4	Weak Average
Workers' congress	<ul style="list-style-type: none"> - Hold workers' congress meetings regularly; - Discuss important issues through the workers' congress; - Approve important decisions by the workers' congress; - Supervise the behavior and conducts of management personnel. 	7	Strong Strong Strong Average
Trade union	<ul style="list-style-type: none"> - Improve labor-management relations; - Ensure the democratic rights of employees; - Care for employees' quality of working life; - Perform duties strictly according to the Trade Union Law. 	7	Strong Strong Strong Average

Recognition and Reward

TQM Implementation Practices	Addressed Areas	Scores	Strengths and Weaknesses
Recognition and reward program	<ul style="list-style-type: none"> - Have recognition and reward plan; - Have objective and measurable criteria for recognition and reward; - Get recognition and reward program approved by the workers' congress. 	8	<p>Strong</p> <p>Strong</p> <p>Strong</p>
Working environment improvement	<ul style="list-style-type: none"> - Improve working environment for recognizing employees' quality improvement efforts; - Pay sufficient attention to employee well-being, safety, morale, and growth; - Reduce employees' working strengths by providing suitable equipment, devices, or tools. 	5	<p>Average</p> <p>Average</p> <p>Average</p>
Salary promotion	<ul style="list-style-type: none"> - Increase employees' salaries on the basis of employees' performance; - Increase employees' salaries fairly and rationally; - Widen salary differences between employees with different skill levels and different contributions. 	5	<p>Strong</p> <p>Strong</p> <p>Weak</p>
Bonus scheme	<ul style="list-style-type: none"> - Set up targets for different employees (teams, departments, or business units); - Align targets with the overall organizational objectives; - Provide more bonuses to well performing employees (teams, departments, or business units). 	5	<p>Strong</p> <p>Strong</p> <p>Weak</p>
Position promotion	<ul style="list-style-type: none"> - Promote employees based on their capabilities, skills, performance, and contributions to the firm; - Appoint and remove managerial personnel (e.g., middle management and supervisors) according to the principle of equal competition, fairness, and rationality. 	8	<p>Strong</p> <p>Strong</p>
Moral award	<ul style="list-style-type: none"> - Provide moral awards to well-performing employees by means of a thank-you note, oral praise, a letter of praise, award certification, or award ceremony; - Reward employees fairly and rationally. 	8	<p>Strong</p> <p>Strong</p>
Penalty	<ul style="list-style-type: none"> - Have an effective penalty criterion; - Penalize employees according to the criterion; - Implement penalty scheme strictly. 	9	<p>Strong</p> <p>Strong</p> <p>Strong</p>

Education and Training

TQM Implementation Practices	Addressed Areas	Scores	Strengths and Weaknesses
Education and training plan	<ul style="list-style-type: none"> - Have an effective education and training plan; - Formulate the education and training plan on the basis of employees' requirements and the firm's resources; - Provide sufficient resources for implementing the education and training plan. 	5	<p>Strong Average</p> <p>Weak</p>
Team learning	<ul style="list-style-type: none"> - Arrange for skillful employees to present their working experiences; - Encourage team members to present their ideas during the process of team activities; - Share knowledge among team members. 	3	<p>Weak</p> <p>Weak</p> <p>Weak</p>
Quality awareness education	<ul style="list-style-type: none"> - Provide quality awareness education to employees regularly; - Provide extensive quality awareness education to newly recruited employees. 	4	<p>Weak</p> <p>Weak</p>
Training for quality management knowledge	<ul style="list-style-type: none"> - Train employees on understanding the philosophy of TQM; - Train employees on understanding ISO 9000; - Train employees on using the seven QC tools, the seven new QC tools, and statistical process control; - Train designers on using design tools such as experimental design. 	5	<p>Strong</p> <p>Strong Weak</p> <p>Weak</p>
Job training	<ul style="list-style-type: none"> - Provide job training for employees to perform their jobs better; - Provide different training to different employees according to their actual job requirements. 	5	<p>Weak</p> <p>Average</p>
Formal education promotion	<ul style="list-style-type: none"> - Encourage employees to follow formal promotion education programs; - Arrange new positions for employees who have finished their promotion education programs. 	8	<p>Strong</p> <p>Strong</p>

Customer Focus

TQM Implementation Practices	Addressed Areas	Scores	Strengths and Weaknesses
Customer complaint information	<ul style="list-style-type: none"> - Establish customer complaint registration system; - Collect customer complaint information extensively; - Treat customer complaints with top priorities; - Analyze customer complaint information to formulate further improvement actions. 	8	<p>Strong Strong</p> <p>Strong Strong</p>
Market investigation	<ul style="list-style-type: none"> - Collect information about customers' needs and expectations through market investigation; - Obtain information about customers' potential needs and expectations; - Formulate effective actions for improving quality of products and services through market investigation. 	4	<p>Weak</p> <p>Weak</p> <p>Weak</p>
Customer satisfaction survey	<ul style="list-style-type: none"> - Have effective customer satisfaction measurements; - Have customer satisfaction levels on the quality of products and services; - Have customer satisfaction information on the quality of products and services from your competitors; - Use the information from customer satisfaction surveys for quality improvements. 	5	<p>Average</p> <p>Strong</p> <p>Weak</p> <p>Strong</p>
Quality warranty	<ul style="list-style-type: none"> - Provide a quality warranty on products sold to customers. 	9	Strong
Customer services	<ul style="list-style-type: none"> - Provide necessary assistance for customers before purchasing, during the process of purchasing, and after purchasing; - Have service standards and implement their standards strictly; - Have skillful sales and service personnel. 	8	<p>Strong</p> <p>Strong</p> <p>Strong</p>
Customer information system	<ul style="list-style-type: none"> - Have an effective customer information system; - Store various data related to customers (e.g., satisfaction surveys, their needs and expectations). 	6	<p>Average</p> <p>Strong</p>

2. Assessment Tool for Overall Business Performance

Due to the features of the four elements of overall business performance, it is necessary to develop different scales to measure employee satisfaction, product quality, customer satisfaction, and strategic business performance.

Note that all information in the columns “Scores”, “Results”, and “Strengths and Weaknesses” is the evaluation result of the case firm’s overall business performance.

Employee Satisfaction

The first column lists addressed areas that may affect employee satisfaction. A number between “0” and “10” is used to score employee satisfaction level. The number “0” means that employees are extremely unsatisfied with the area and the number “10” indicates they are extremely satisfied with the area. The scores are listed in the second column. During the process of assessment, the strength or weakness of each addressed area (which is listed in the third column) should be pointed out. If the firm is neither strong nor weak in an area, “Average” should be indicated. Through conducting assessment, areas needing improvement can be identified. Such areas can be used by the firm to formulate improvement plans in order to improve employee satisfaction. Note that if some areas are not applicable to the firm, “Not applicable” should be indicated in the column “Scores”. Scoring each addressed area should be based on evidence rather than imagination.

Addressed Areas	Scores	Strengths and Weaknesses
- Annual income (e.g., salary, bonus);	4	Weak
- Equity, fairness, and equal opportunities;	8	Strong
- Recognition and reward schemes;	8	Strong
- Job security;	4	Weak
- Democratic management (e.g., involvement in setting the firm’s policies, strategies, and plans);	6	Average
- Leadership style and ability;	6	Average
- Top managers’ and supervisors’ conduct;	6	Average
- Relationships with top managers and supervisors;	6	Average
- Relationships with coworkers;	7	Strong
- Promotion opportunities;	7	Strong
- Nature of jobs (e.g., work loads, job content);	7	Strong
- Career development (e.g., training, retraining, and target setting);	5	Average
- Working conditions (e.g., safety, noise, and pollution).	5	Average

Product Quality

The first way to measure product quality is to compare a firm's own product quality with that of other firms in the same industrial sector in China (see the first table). Each area can be measured by a number between "0" and "10". The number "0" means that this area is the worst compared with other firms within the same industrial sector in China, and the number "10" means that this area is the best in this comparison. Thus, information from other firms is essential to the comparative assessment. Of course, the firm should have its own data concerning these addressed areas; otherwise, the assessment is impossible. Even if the firm does not have external data, it can assess its product quality based on its own data over the past several years. This is the second way to assess the firm's product quality (see the second table). Through conducting assessment, areas needing improvement can be identified. Such identified areas can be used by the firm to formulate improvement plans. Note that if some areas are not applicable to the firm, "Not applicable" should be indicated in the column "Scores" or "Results". The first table measures relative product quality and the second table measures the firm's actual product quality.

Relative Product Quality

Addressed Areas	Scores	Strengths and Weaknesses
- Performance;	8	Strong
- Reliability;	8	Strong
- Durability;	8	Strong
- Conformity rates (finished products);	10	Strong
- <i>Internal defect rates (during manufacturing process);</i>	8	Strong
- <i>Internal failure costs as a percentage of annual output value;</i>	8	Strong
- <i>External failure costs as a percentage of annual sales (e.g., warranty costs and claims costs).</i>	8	Strong

Note: The three addressed areas in italics are not used for assessing customer satisfaction.

Actual Product Quality

Addressed Areas	Results 1996	Results 1997	Results 1998	Results 1999	Strengths and Weaknesses
- Performance;	*	*	*	*	Strong
- Reliability;	*	*	*	*	Strong
- Durability;	*	*	*	*	Strong
- Conformity rates (finished products);	100%	100%	100%	100%	Strong
- <i>Internal defect rates (during manufacturing process);</i>	0.40% ¹	0.20% ¹	0.19% ¹	0.09% ¹	Strong
- <i>Internal failure costs as a percentage of annual output value;</i>	5.0% ²	5.1% ²	4.4% ²	4.1% ²	Strong
- <i>Internal failure costs as a percentage of annual sales (e.g., warranty costs and claims costs).</i>	0.258%	0.136%	0.125%	0.086%	Strong
- <i>External failure costs as a percentage of annual sales (e.g., warranty costs and claims costs).</i>	1.040%	0.773%	0.588%	0.554%	Weak

Notes: 1 - These figures are internal defect rates for processing parts.

2 - These figures are internal defect rates for casting iron.

* - This symbol means that these three areas are stipulated in the product standard.

Customer Satisfaction

There are two dimensions that affect customer satisfaction: Product quality and service quality, which are listed in the first column. The second column lists the specific addressed areas. To measure customer satisfaction, a number between “0” and “10” is used to score customer satisfaction level. The number “0” means that customers are extremely unsatisfied and the number “10” indicates that they are extremely satisfied. The scores are listed in the third column. During the process of assessment, the strength and weakness of each addressed area (listed in the fourth column) should be pointed out. If the firm is neither strong nor weak in an area, “Average” should be indicated. Through conducting assessment, areas needing to be improved can be identified. Such identified areas can be used by the firm to formulate improvement plans. Note that if some areas are not applicable to the firm, “Not applicable” should be indicated in the column of “Scores”. Scoring each addressed area should be based on evidence from customers rather than imagination. Three addressed areas (in italics, Section 7.4.2) for measuring product quality are not used for measuring customer satisfaction since they generally do not affect customer satisfaction.

Dimensions	Addressed Areas	Scores	Strengths and Weaknesses
Product quality	- Performance;	8	Strong
	- Reliability;	4	Weak
	- Durability;	9	Strong
	- Conformity rates (finished products).	9	Strong
Service quality	- Delivery (e.g., on-time delivery, delivery frequency, lead time);	7	Strong
	- Complaints (e.g., complaint response time, effective resolution, time to resolve complaints, percent of complaints resolved on first contact, complaint levels, total number of complaints);	8	Strong
	- Warranty and guarantee provisions;	9	Strong
	- Support (sales support, technical support, product training, spare part availability);	8	Strong
	- Transportation (e.g., logistics information, packing for delivery).	5	Weak

Strategic Business Performance

For measuring strategic business performance, the addressed areas are listed in the first column. The results are listed in the second to fifth columns. The strengths and weaknesses are listed in the sixth column. Concerning the results of strategic business performance, the data should be available for at least four years. Of course, it is much better to have more data on strategic business performance from a long time period.

Addressed Areas	Results 1996	Results 1997	Results1 998	Results 1999	Strengths and Weaknesses
- Annual sales (million yuan);	47.13	67.32	68.48	53.15	Weak
- Annual sales growth;	-19.9%	42.8%	1.7%	-22.4%	Weak
- Profits (million yuan);	1.2	1.3	1.0	0.5	Weak
- Market share;	25.6%	31.5%	35.92%	38.2%	Strong
- Exports (million yuan).	4.81	6.19	4.35	0.88	Weak

Note: Market share was calculated by the firm's output volumes divided by the total of output volumes in Liaoning Province.

Appendix 6 A List of the Major Interviewees in the Case Firm

Interviewees' working units	Positions
Top Management Team	Deputy general manager
Exporting Department	Manager
Planning Department	Economist
Management Department	Manager
Management Department	Engineer
Quality Management Department	Engineer
Production Department	Manager
Production Department	Production coordinator inside the firm
Production Department	Production coordinator outside the firm
R&D Department	Assistant manager
R&D Department	Engineer
R&D Department	Computer expert
Personnel and Education Department	Personnel manager
Personnel and Education Department	Salary manager
Users' Service Department	Manager
Purchasing Department	Deputy manager
Technology Department	Deputy manager
Technology Department	Engineer
Sales Department	Salesman
Quality Inspection Department	Inspection planner
Quality Inspection Department	Inspectors
Trade Union	Chairman
Trade Union	Deputy chairman
Auditing Department	Lawyer
Equipment & Power Department	Manager
Speed Reductor Workshop	Manager
Speed Reductor Workshop	Deputy manager
Speed Reductor Workshop	Planner
Speed Reductor Workshop	Production coordinator
Speed Reductor Workshop	Operators

Note: In order to conduct the case study conveniently the firm arranged a coordinator, who worked in the Exporting Department. For the reason of anonymity, the names of these interviewees are not presented here.

A List of Abbreviations

ACSI:	The American Customer Satisfaction Index
AGFI:	Adjusted goodness-of-fit index
CAD:	Computer-aided design
CSB:	The Customer Satisfaction Barometer
GFI:	Goodness-of-fit index
GLS:	Generalized least squares
ISO:	International Organization for Standardization
ISO 9000:	ISO 9000 series standards include three basic standards (ISO 9001, ISO 9002, and ISO 9003), which can be used in third party certification of quality management systems.
JDI:	The Job Descriptive Index
JDS:	The Job Diagnostic Survey
JIG:	The Job in General Scale
JSS:	The Job Satisfaction Survey
LISREL:	Structural equation modeling is simply known as LISREL analysis, which is the name of one of the more popular software packages.
ML:	Maximum likelihood
MOAQ:	The Michigan Organization Assessment Questionnaire Subscale
MSQ:	The Minnesota Satisfaction Questionnaire
PDCA:	Plan, do, check, and act.
PRELIS:	A preprocessor for LISREL - A program for multivariate data screening and data summarization
QC:	Quality control
QFD:	Quality function deployment
R&D:	Research and development
RMB:	The Chinese currency unit. USD 1 is approximately RMB 8.3.
RMR:	Root mean square residual
RMSEA:	Root mean square error
SPC:	Statistical process control
SPSS:	Statistical Packages for the Social Sciences
TQM:	Total quality management
WLS:	Generally weighted least squares

