

Perceived Organizational Performance Changes Resulting from Customer-Supplier Joint Action

Seungho Jung

Department of MIS, Pusan University of Foreign Studies, sjung428@taejo.pufs.ac.kr

Abstract

The objective of this research is to identify *perceived* organizational performance changes resulting from customer-supplier partnership and their joint action. In addition, the *perceived* organizational performance change in this research is compared with *objectively measured* organizational performance improvement to see if there is any difference between them.

1. Problem statement

What is meant by a customer-supplier (C-S) partnership and how is it operationally defined? Many researchers and practitioners have tried to identify the component variables that explain the nature of C-S partnerships. Among factors identified, commitment to long-term relationship, specific investment, trust, two-way communication, and joint action have been used most frequently to explain changing C-S partnerships in terms of their importance in and contribution to the accomplishment of the goals and objectives of the relationship (Heide & John, 1990 and 1992; Kaufmann & Dant, 1992; Kaufmann & Stern, 1992).

The major interest of this research is in the C-S partnership characterized by joint action between the two organizations. Joint action is defined as *the inter-penetration of organizational boundaries* (Guetzkow, 1966, p. 13) to accomplish the goals and objectives of both organizations. A move toward a partnership involves two parties carrying out the focal activities in a cooperative or coordinated way.

Then, what are consequences of the C-S joint action? The objective of this research is identifying and explaining specific organizational performance changes resulting from the C-S joint action. To achieve this objective, the following operational research model is used.

2. Operational research model

As seen in Figure 1, the focus of this research is on the consequences of the C-S joint action and their shared results. A total of four variables are used in this research and defined as follows:

- C-S joint action: Interpenetration of organizational boundaries using either specific TQM tools or other joint practices, or both;
- Quality: supplier's defect rate, quality of final products, supplier's service quality of incoming purchased items;

- Cost: supplier's and customer's total cost, changes in product price;
- Cycle time: time between order and delivery.

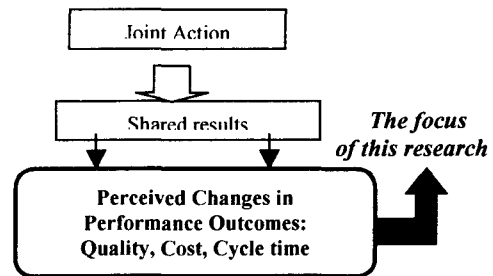


Figure 1. Operational Research Model

To achieve the above-mentioned objective, the research question – what changes (increase or decrease) in three organizational performance dimensions are perceived as a result of C-S joint action? – needs to be answered using the C-S partnership survey developed by the researcher. It is shown in Appendix.

3. Data collection

For this research, a total of 1,811 potential mailed survey questionnaire respondents were selected from the *Directory of Corporate Affiliations* (1998; 999 persons) and the American Society for Quality (ASQ) Customer-Supplier Division (812 persons), all of whom belong to the following five sample selection criteria: (1) Industry type and ownership – private manufacturing, (2) Geographic location – U.S.-based, (3) Number of participants – 1,811 potential respondents, (4) Industry scope – SIC 35 (industrial equipment and machinery), 36 (electronic and electric equipment), and 37 (transportation equipment), and (5) Nature of participants – partnerships. A total of 121 usable surveys were returned.

4. Results

The following four points are addressed in this section using the 121 usable surveys returned.

First, Table 1 at the end of this research shows the average perceived performance dimensions with respect to three perspectives – customer, supplier, and overall (customer+supplier). As shown, quality was the most improved performance dimension perceived by managers as a result of C-S joint action, followed by cycle time and cost, regardless of

perspectives. Although no evidence was provided from this research regarding why quality was the most improved performance dimension, one possible reason may be that a higher number of responses was recorded from managers of quality related functions than other positions. In other words, a higher perceived improvement in quality may be due to the nature of the job position of respondents, where quality managers would be expected to have increased attention to quality and be involved with initiatives specifically to improve quality.

Second, tools/joint practices were examined to see which tools/joint practices were considered most responsible for perceived improvements in each of the three dimensions in terms of their frequency identified by respondents. Table 2 shows the results. Findings from Table 2 are:

- Two tools/joint practices – QFD (tool/joint practice #6) and joint investment on R & D (tool/joint practice #14) – have been used exclusively by suppliers to improve quality.
- Quality circles (tool/joint practice #5) have been used exclusively by suppliers to reduce cost.
- QFD (tool/joint practice #6) has not been used by either customers or suppliers to reduce cycle time.
- ISO 9000 and/or QS 9000 and/or Baldrige criteria (tool/joint practice #17) have been used exclusively by customers to reduce cycle time.
- Tools/joint practices used most *and* least to improve three perceived performance dimensions are also derived from Table 2. They are shown in Table 3.

Third, respondents reported a 25% overall improvement in perceived organizational performance as a result of using all tools/joint practices identified (average 25% improvement from 68 customers and 25% improvement from 57 suppliers). And fourth, to identify differences, if any, between perceived and objectively measured organizational performance improvements in quality, cost, and cycle time, frequently used performance dimensions in Table 4 and findings from this research were compared. Table 5 shows the results. Two noticeable findings are derived from Table 5. First, the overall improvement in quality that is perceived by participants in this research is higher than the

improvement in quality that was objectively measured by other researchers. Second, compared to this research, a slightly higher improvement (reduction) in cycle time was observed in previous studies that objectively measured lead-time.

5. Conclusions

In Section 4, it was found that different tools/joint practices have been used to improve each of the three perceived performance dimensions – quality, cost, and cycle time – as follows:

- Statistical process control, joint problem-solving teams, and quality audits have been used to improve perceived quality (customer: 31%, supplier: 28%, and overall: 30%),
- JIT delivery/production and joint problem-solving teams have been used to reduce perceived cost (customer: 24%, supplier: 18%, and overall: 21%), and
- JIT delivery/production, joint problem-solving teams, and exchange of strategic information have been used to reduce cycle time (customer: 28%, supplier: 23%, and overall: 26%).

It appears that managers have used joint problem-solving teams more frequently than other tools/joint practices as a means for improving all three performance dimensions.

A next question is: How much are these improvements in *perceived* organizational performance dimensions different from improvements in the same organizational performance dimensions *measured objectively* by other researchers? However, no conclusion regarding this comparison cannot be made (e.g., improvements in this research appear higher) for the following two reasons. First, operational measures used to determine the degree or amount of improvement in the three performance dimensions may be different between this research and previous studies. Second, because organizational performance improvements identified in this research were perceptions of participants in the mailed survey questionnaire, it cannot be concluded that improvements resulting from the use of tools/joint practices are higher in this research as compared to previous studies.

References

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Appendix

(1) In this question, you are asked to do three things. **First**, check(✓) only tools/practices your company is using jointly with your partner. **Second**, indicate the overall effectiveness of each tool or joint practice you checked by using the 6-point ordinal scale (see below). And **third**, indicate whether or not each tool or joint practice you checked is internalized into the way you and your partner company do business by using the 6-point ordinal scale.

Tools/Practices	Effectiveness / Internalization	
Benchmarking []	()	/ ()
Cost of quality []	()	/ ()
Gainsharing []	()	/ ()
JIT production & delivery []	()	/ ()
Quality circles []	()	/ ()
Quality function deployment []	()	/ ()
Statistical process control []	()	/ ()
Supplier certification/verification []	()	/ ()
Joint quality education/training []	()	/ ()
Joint problem-solving teams []	()	/ ()
Joint planning []	()	/ ()
Exchange of strategic information []	()	/ ()
Quality audit []	()	/ ()
Joint investment on R & D []	()	/ ()
In-plant representative []	()	/ ()
Supplier or customer performance Measurement system []	()	/ ()
ISO 9000 and/or Qs 9000 and/or Baldrige criteria []	()	/ ()
Dynamic control tools: e.g. flow diagram and FMEA []	()	/ ()

(2) Please list below any additional tools /practices not listed in Question #(1) that you and your partner company are using jointly.

Tools/Practices	Effectiveness / Internalization	
.....	()	/ ()
.....	()	/ ()
.....	()	/ ()

..... () / ()
 () / ()

(3) *First*, identify the impact of using tools or joint practices by specifying a *percentage increase* or *decrease*. *Second*, identify only tools/practices that are predominantly responsible for the percentage increase/decrease in quality, cost, cycle time, and other performance dimensions.

Performance Dimensions	Impacts +: Increase -: Decrease	Tools/joint practices used
Quality	()% +/-
Costs	()% +/-
Cycle time	()% +/-
Overall	()% +/-

(4) Based on all the tools/joint practices you identified in Questions #(1) and (2), what is the overall effect on organizational performance? (Please specify a percentage increase or decrease.)

Specify% Check only one Increase [] / Decrease []

Customer-Supplier Partnership Survey

[Survey items #(1) and (2) are answered using 6 point ordinal scales: 1 - Strongly disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Mildly agree, 5 - Agree, and 6 - Strongly agree]

Table 1. Average Perceived Improvements in Three Organizational Performance Dimensions

Perspectives	Customer (C)			Supplier (S)			Overall (O)		
	N	Mean (%)	Std Dev	N	Mean (%)	Std Dev	N	Mean (%)	Std Dev
Quality	67	31	43.21	54	28	23.58	121	30	35.71
Cost	59	24	27.99	48	18	18.60	107	21	24.29
Cycle time	50	28	25.08	42	23	20.63	92	26	23.19

Table 3. Tools/Joint Practices Used Most and Least (or Never Used)

	Quality			Cost			Cycle time		
	C	S	O	C	S	O	C	S	O
Tools/joint practices used most	10	7	7	4	10	4	4	4	4
	13	13 & 17	10	12	7	10	11	11	11
	7 & 16	10	13	10	4	12	12	1 & 10 & 12	12
Tools/joint practices used least (or never used)	6	3	3	5	5 & 6 & 15	5	2 & 5 & 6	3 & 6 & 17	6
	7	4 & 5	5 & 14	6	1 & 15	6	6	2 & 5 & 15 & 16	2 & 3 & 5
	3 & 5	14	8	14	9 & 15	9 & 15	3 & 9 & 14	& 18	

Table 2. Frequency of Tools/Joint Practices Used to Improve Quality, Cost, and Cycle Time

Tools/joint practices	Quality			Cost			Cycle time		
	C (67)	S (54)	O (121)	C (59)	S (48)	O (107)	C (50)	S (42)	O (92)
1	8	6	14	8	3	11	5	6	11
2	2	6	8	7	9	16	0	1	1
3	1	1	2	7	4	11	1	0	1
4	6	4	10	21	11	32	27	17	44
5	1	4	5	0	2	2	0	1	1
6	0	10	10	2	2	4	0	0	0
7	21	21	42	6	12	18	3	6	7
8	14	12	26	4	8	12	4	3	9
9	7	6	13	5	2	7	1	3	4
10	28	14	42	15	13	28	10	6	16
11	4	8	12	14	13	27	18	14	32
12	9	6	15	19	9	28	12	6	18
13	25	15	40	7	9	16	2	3	5
14	0	5	5	3	5	8	1	4	5
15	6	6	12	4	3	7	6	1	7
16	21	12	33	8	6	14	5	1	6
17	13	15	28	6	5	11	7	0	7
18	10	8	18	4	4	8	2	1	3
Total	176	159	335	140	120	260	104	73	177
[Average]	[2.63]	[2.94]	[2.77]	[2.37]	[2.50]	[2.43]	[2.08]	[1.74]	[1.92]

- 1: Benchmarking
 2: Cost of quality
 3: Gainsharing
 4: JIT delivery/production
 5: Quality circles
 6: Quality Function Deployment
 7: Statistical process control
 8: Supplier certification/verification
 9: Joint quality education/training
 10: Joint problem-solving teams
 11: Joint planning
 12: Exchange of strategic information
 13: Quality audit
 14: Joint investment on R&D
 15: In-plant representative
 16: Supplier or customer performance measurement system
 17: ISO 9000 and/or QS 9000 and/or Baldrige criteria
 18: Dynamic control tools (e.g., flow diagram, FMEA)

Table 4. Frequently Used Performance Dimensions (q1: supplier, q3: customer)

Performance dimensions	Specific performance results
Quality	q1's improved quality and reduced defect rate; q3's improved quality of final product (Chen & Batson); Higher quality of q1's service (Cross); Improved quality of supplier's operations (processes), improved quality of incoming purchased items (Graham et al.); Overall field return rate (17%), re-return rate (14%), no trouble found rate (19%) (Johnson); q3's rework reduced by 24%, scrap rate reduced by 21%; q1's quality improved by 26% (Raia); Supplier's improved quality (Schonberger & Ansari)
Cost	q3's reduced inspection cost of outgoing products (Chen & Batson); Sharing of cost savings (Cross); Decreased supplier's/customer's total cost (Graham et al.); WIP inventory reduced by 31%, costs reduced by 11% (Raia); Reduced repair cost (Morgan and Zimmerman); Reduced engineering expense by 50% and reduced drafting expense by 20% (Vera et al.)
Cycle time	Lead-time reduced by 29% (Raia); Reduced lead-time cost (Morgan and Zimmerman)
OTHERS	Reduced product price (Hauser; Vera et al.); Use of SPC tools (Chen & Batson) Increased productivity by 7.5% (Stuart and Muller; Vera et al.)

Table 5. Perceived Vs. Objective Performance Improvements in Quality, Cost and Cycle Time

Performance Dimensions	Perceived improvements (in this research)	Objective improvements (other researches)
Increase in quality	Customer: 31% Supplier: 28% Overall: 30%	Re-return rate: 14% Overall field return rate: 17% No trouble found rate: 19% Reduction in scrap rate: 21% Reduction in q3's rework: 24% q1's quality improvement: 26%
Decrease in cost	Customer: 24% Supplier: 18% Overall: 21%	Cost reduction: 11% Reduction in drafting expense: 20% Reduction in WIP inventory: 31%
Decrease in cycle time	Customer: 28% Supplier: 23% Overall: 26%	Lead time reduction: 29%