The impact of supply chain relationship quality on quality performance
(Case study: Sugar Factory of Naghadeh city)

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ABSTRACT: There is a considerable body of scholarly work focusing on the interaction between the various dimensions of supply chain (SC) relationships (such as trust, commitment, adaptation, communication and collaboration) but far less on the impact of SC relationships on performance. There has also been a considerable body of empirical research that has examined the impact of quality practices on quality performance. However, the effect of SC relationships on quality performance has received less attention. Accordingly, this paper considers (a) whether or not it is possible to measure the multi-dimensional nature of SC relationships and (b) if so, what is the effect of SC relationships on quality performance? To address these questions, we developed a conceptual framework incorporating dimensions of SC relationships and quality performance. The model was tested with data collected from 120 suppliers in the Staff in the SugarFactory of Naghadeh. Our findings provide considerable support for our conceptual model.

Keywords: Quality; Relationships; Supply chain; Performance

INTRODUCTION

In recent times, the nature of supply chain (SC) relationships has undergone some dramatic changes. Companies have been encouraged to develop close partnerships with suppliers and customers alike. Contemporaneously, firms have also been exhorted to adopt quality management (QM) tools and techniques if they wish to survive and prosper. In both cases, prescriptive solutions and rhetoric are the hallmark of much of the practitioner literatures (Sitkin et al., 1994). Not surprisingly many firms viewed such solutions with a considerable degree of cynicism (Fynes and Ennis, 1994). In the academic literature, empirical research in the area of SC relationships have primarily sought to explain the nature of relationship processes rather than their effect on operating or business performance (Styles and Ambler, 2000). As a result, there is a considerable body of work focusing on the interaction between the various dimensions of SC relationships (such as trust, commitment, adaptation, communication and collaboration) but far less on the impact of SC relationships on performance, with the exception of Kuei et al. (2001). As such, the SC relationship partnership construct has been frequently operationalised in a one-dimensional rather than multi-dimensional manner. On the other hand, there is a considerable body of empirical research that has examined the impact of QM practices on quality performance (Flynn et al., 1996; Adam et al., 1997; Hendricks and Singhal, 1997; Choi and Eboch, 1998; Easton and Jarrell, 1998; Samson and Terziovski, 1999; Fynes and Voss, 2001). Interestingly, the effect of SC relationships on quality performance has received less attention. Indeed in the marketing literature, empirical studies of causal impacts on quality performance have been primarily concentrated within the domain of the more traditional “neoclassical” marketing mix paradigm (e.g. profit impact of market share (Buzell and Wiersema, 1981), market orientation (Lai, 2003), interdepartmental interactions (Menon et al., 1997) and service quality (Parasuraman et al., 1985)) rather than within the relationship marketing paradigm (which has a strong SC orientation). Accordingly, this paper posits the following research questions:

(a) Is it possible to measure the multi-dimensional nature of SC relationships in terms of a higher order construct?
(b) If so, what is the effect of SC relationships on quality performance?
The remainder of this paper is structured as follows: firstly, we review the theoretical context and outline our hypotheses; secondly, we describe our methodology: thirdly we develop and test a model of SC relationships and quality performance; fourthly, we reflect on the implications of our study and conclude with some suggestions for future research.

**Theoretical background and hypotheses**

Researchers have adopted different theoretical frameworks in order to explain the nature of SC relationships. These include transaction cost theory, politicaeconomy theory, social exchange theory and resource dependence theory (Robicheaux and Coleman, 1994). These theoretical frameworks have all contributed to the modeling of SC relationships both in their identification of the underlying dimensions of relationships and their selection of appropriate units of analysis (such as firm, dyad or network). There is also clear evidence of what Robicheaux and Coleman (1994, p. 40) call "paradigm convergence" both in terms of further theory building and empirical theory testing. In addition, different but complementary streams of research have appeared in the somewhat diverse areas of industrial and business-to-business marketing, channel management, relationship marketing, operations management, supply chain management, logistics and purchasing. They include the IMP (Industrial Marketing and Purchasing Group) Interaction Model, Network Models, Channel Models, Process Models and Partnership Models. The IMP Interaction Model and the Network Model have been developed primarily by Scandinavian scholars. Because they consider the temporal dimension of relationship formation, maintenance and dissolution, most studies are longitudinal in design and are based on either the dyad or the network as the unit of analysis (Ha$kansson, 1982; Ford, 1984). The contribution of North American scholars is more clearly evident in the Channel and Process Models.

These studies are grounded in transaction cost, social exchange and resource dependence theories. Research design and analysis reflects the traditional primarily positivist emphasis that is a feature of mainstream marketing literature (E$- Ansary and Stern, 1972; Gassenheimer and Calantone, 1994; Gundlach and Cadotte, 1994; Anderson, 1995). There is thus a strong emphasis on theory building, scale development and theory testing, typically using the firm or the dyad as the unit of analysis. Partnership models have largely derived from an operations management focus on Japanese management and business practices. To carried out in the automobile industry and has strong ties with the concept of lean production.

There is a considerable emphasis on the impact of operations practices on performance in many of these studies (Hellberg and $vind, 1990; Lamming, 1993; Ellram and Krause, 1994; Hines, 1994; Panizzolo, 1998). Is there any evidence of convergence between these models? Wilson and Kristan Moller (1991, p.103) wryly remark that "researchers on either side of the Atlantic seem to ignore the work of each other". This can most likely be attributed to differences in research traditions, industry structure and socio-economic factors across both regions. Notwithstanding this dichotomy, it can be argued that a ‘relational paradigm’ has emerged from the various research streams. Synthesising these streams, Wilson and Kristian Moller conclude that “what becomes apparent is the number of constructs that are shared in the different models” (p. 103). These dimensions include trust, commitment, communication, power/dependence, adaptation and collaboration. We now consider each of these in more detail.

**METHODOLOGY**

The instrument used to test the stated hypotheses was a Questionnaire. A draft questionnaire based on existing measurement scales for the research constructs was initially drafted. This draft questionnaire then was pretested with academics and practitioners to check its content validity and terminology and modified accordingly. The modified questionnaire was then pilot tested to check its suitability and appropriateness for the target population before mailing. To encourage completion, respondents were promised, and received, a summary of the research findings. Two repeat Questionnaire of the instrument were carried out to improve the overall response rate. For the purposes of this study, we adopted the approach used by Sako et al. (1994), where respondents were asked to reply to questions with respect to the basis of the most important or focal customer–product relationship.

**Sample**

The population chosen for this study were manufacturing companies in the staff in the Sugar Company of Naghadeh. The reasons for focussing on this Staff are twofold. As such the Staff is predominantly influenced by competitive rather than regulatory forces. Secondly the sector is heterogeneous in terms of sub-sectors and product/process complexity.

Thus, the external validity of the results is not as severely compromised by our single-industry focus as it would be for a more homogenous.
Figure 1. Structural equation model operational sing framework.

**Analysis and findings**

The degree to which the sample is representative of the population was addressed by carrying out a series of standard $\chi^2$ goodness-of-fit tests with respect to employee numbers, plant ownership and plant age (see Table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Average</th>
<th>Standard deviation</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>23/13</td>
<td>45/3</td>
<td>01/0</td>
</tr>
<tr>
<td>Commitment</td>
<td>70/11</td>
<td>78/2</td>
<td>01/0</td>
</tr>
<tr>
<td>Co-operation</td>
<td>21/8</td>
<td>64/2</td>
<td>01/0</td>
</tr>
<tr>
<td>Adaptation</td>
<td>97/12</td>
<td>07/3</td>
<td>01/0</td>
</tr>
<tr>
<td>Interdependence</td>
<td>92/12</td>
<td>11/4</td>
<td>05/0</td>
</tr>
<tr>
<td>Communication</td>
<td>21/16</td>
<td>11/6</td>
<td>/05</td>
</tr>
<tr>
<td>Conformance quality</td>
<td>43/12</td>
<td>16/3</td>
<td>01/0</td>
</tr>
</tbody>
</table>
Table 1. Confirmatory factor analysis and reliabilities

For each of the characteristics, we found no significant difference between the population percentages and the sample percentages. This suggests that the sample response profile is not significantly different from the population profile and that the sample is broadly representative on key variables. The descriptive data collected (plant size, ownership) confirmed much of what is already known about the electronics sector in Ireland in terms of industry structure. On the one hand, the majority of companies are relatively small, independently owned indigenous operations, and, on the other, there are a smaller number of larger plants that are subsidiaries of overseas companies.

Table 2.

<table>
<thead>
<tr>
<th>RMSEA</th>
<th>PNFI</th>
<th>AGFI</th>
<th>CFI</th>
<th>GFI</th>
<th>X^2/df</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/056</td>
<td>0/86</td>
<td>0/91</td>
<td>0/96</td>
<td>0/94</td>
<td>2/45</td>
</tr>
</tbody>
</table>

**DISCUSSION AND IMPLICATIONS**

Our findings indicate SCRQ has a positive impact on design quality (H3) but not on conformance quality (H2). This suggests that by developing and engaging in true partnership types of SC relationships, suppliers can become much more proactive in the design and new product development process. As more and more of design responsibility devolve to such suppliers, customers will recognize their competitive edge with respect to design capability. Suppliers with such design capability can thus contribute much more than merely conforming to a manufacturing specification (although support for H4 indicates the positive effect of design quality on conformance quality). The finding that SCRQ does not have an an impact on conformance quality may be because conformance quality is a fundamental competitive pre-requisite, irrespective of the nature of SCRQ. Furthermore, support for the design quality—customer satisfaction (H5) and the conformance quality—customer satisfaction (H6) further substantiate the findings of previous studies (Ahire and Dreyfus, 2000; Fynes and Voss, 2001). While this research has contributed to the body of knowledge in the quality management discipline, we suggest that the following areas could further enhance and extend theoretical development. As is often the case, longitudinal research could provide valuable contributions to theory, development and refinement in the fields of SC relationships. There is a significant temporal dimension to how buyer–seller relationships develop. Accordingly, tracking the development of SC relationships could help clarify cause and effect relationships between variables. A research design, described by Anderson (1995) as “cross-sectional research which is longitudinal in character” presents an interesting approach to data collection in this regard. This involves identifying critical indicators of each stage of SC relationship development from a set of relationship dyads at pre-ordained points in time. These critical indicators could then be used as a basis on which to separate the relationships into those that are at similar stages of development. These subsamples could then be analysed separately, and the effects of temporal constructs assessed empirically.

**REFERENCES**


