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The Influence of Marketing Logistics Networks on Organisational Performance in Australia and New Zealand

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Abstract

Predictions concerning the influence of traditional and online marketing logistics network competency on organisational performance were tested via structural equation modelling employing a sample of Australian and New Zealand companies. The study finds a significant influence of the use of traditional marketing logistics networks on organisational performance, but that the use of the Web in this regard is yet to have such an influence.

Keywords: Marketing, logistics, organisational performance.

Background

The study reported in this paper examines the integration of the World Wide Web (Web) in marketing logistics network management, and its influence on organisational performance. The paper presents an overview of the pertinent literature before presenting the methodology employed, and discussing the findings. The paper concludes with a discussion of the study's limitations and suggested further research.

Marketing Logistics Networks and the Web

Bucklin (1965) observed that the majority of operations involving physical products find the need to produce to inventory rather than to order, thereby operating on the principle of speculation, rather than postponement, to reduce costs. Since that time, organisations have aimed to reduce logistics costs, particularly finished goods inventory costs, and to reduce business dependency on forecasting demand, in favour of methods that permit producing to order. Today, more than ever, this is achieved by co-ordinating the activities of network partners using electronic tools and technologies that have moved beyond electronic data interchange (EDI) to embrace the Web (Steinfield, Kraut & Plummer, 1995).

Managing marketing logistics networks, whether mainly traditional networks (MLN) or online (OMLN), concerns the integration of materials management (inputs), conversion operations, and distribution of finished products through marketing channels. A marketing channel may be defined as “the set of entities that are brought into relation with one another in respect to a particular commodity flow” (Balderston, 1958, p. 155). A “transorganisational firm” (Achrol, 1991, p. 87) which has integrated these aspects of its logistics system may reduce transport costs by deploying its own transport, or an owner-driver fleet, to variously collect inputs and distribute finished product throughout a single time period. Many organisations, whether they commenced operations on the Web, or in a more traditional manner, have turned to the Web to assist in co-ordinating their logistics operations. The marketing organisation that uses the Web is, arguably, seeking to optimise its costs by using this interface, if not also seeking broader market coverage. For example, a restaurant may place wine and beverage orders through a trade hub and download a printable version of the wine list ready for next day use, while simultaneously using the Web as an information
source regarding competitive activity, and promoting itself via search engines and related portal sites.

While it is recognised, as Wilkinson (2001) observed, that to effectively study network relationships in this context, it is necessary to interact with many respondents within organisations, and at many levels from both sides of the buyer-seller dyad (e.g., Anderson & Narus, 1990), nevertheless, the present study employed a self-administered questionnaire with single decision-makers. In so doing, the aim was to examine the degree to which companies are logistically competent, and to relate this to organisational performance. Arguably, there are difficulties in measuring annual expenditure to perform marketing logistics functions, as well as the questionable relevance of such absolutes when “logistic expenditures typically range from five to 55 per cent of sales depending on the type of business, geographical area of operation, and weight/value ratio of products” (Bowersox & Closs, 1996, p. 5). It was, therefore, decided to assess respondents’ logistics objectives in this study.

A set of operational objectives was used “which are the primary determinants of logistical performance … rapid response, minimum variance, minimum inventory, movement consolidation, quality, and lifecycle support” (Bowersox & Closs, 1996, p. 41). Scale items anchored with Disagree Strongly and Agree Strongly were used with statements such as the following developed from Bowersox and Closs' logistics operating objectives:

- Top management in this organisation encourage an organisation-wide or HOLISTIC APPROACH to logistics management (logistic).
- Our organisation is oriented towards postponing logistical operations to the latest possible time and then accomplishing RAPID DELIVERY of required inventory (rapres).
- Top management MONITOR SYSTEM VARIANCE in our organisation's logistics systems so as to reduce the effects of time disruptions on customers (minvarnc).
- Our organisation aims to MINIMISE INVENTORY deployed throughout the logistical system (mininvnt).
- Top management in our organisation encourage innovative programs to achieve MOVEMENT CONSOLIDATION and thereby reduce transport costs (movcons).
- Our organisation seeks CONTINUOUS QUALITY IMPROVEMENT as a logistical objective (quality).
- Our organisation has PRODUCT LIFECYCLE SUPPORT in place to accommodate such reverse logistics eventualities as product recalls, as well as aftermarket service (lifcycsp).

In examining the use of the Web in marketing logistics network management, items employed by Adam and Deans (2000) were utilised, and scaled in a similar manner to other items in the study:

- Our organisation uses the Web to SUPPORT SALES ENQUIRIES concerning orders placed through marketing channels other than the Web (servictr).
- Our organisation uses the Web to PROVIDE LOGISTICAL INFORMATION (e.g., inventory, order-tracking) in real-time to customers (provinfo).
- Our organisation uses the Web to REDUCE LOGISTICS COSTS (cutlgcos).
- Our organisation's website(s) are fully transactional and CONNECTED TO THE ORGANISATION'S BACK-END PROCESSES (e.g., billing and accounts payable) (backend).
Organisational Performance

Another key question facing each type of organisation is which objective (independently verified) and subjective (self-reported) performance measures to use. Ambler and Kokkinaki (1997) reviewed 150 prior studies covering the period 1991 to 1995 and found that the three most widely used organisational performance (OP) measures were sales (and growth) (22 per cent of all measures), market share (17 per cent), and profit contribution (11 per cent). However, financial measures dominated (67 per cent). In extending this study, Pont and Shaw (2003) found that while the majority of measures were still financially oriented (54 per cent of indicators used), non-financial measures were increasingly being favoured.

The present study employed Ambler et al.’s. (2001), measures of organisational performance, which are identified in the discussion of the findings (Also see Ambler, Kokkinaki and Putoni (2004)). A total of 27 measures were employed covering either the past three financial years or past financial year. The final items employed, following trimming, are detailed in the discussion section of the paper.

Research Aims

The paper reports the results of testing the following hypotheses:

H₁ Traditional marketing logistics network competency (MLN) directly influences organisational performance (OP).

H₂ Online marketing logistics network competency (OMLN) directly influences organisational performance (OP).

Method

The unit of analysis in this study is the marketing organisation. Senior managers, including those responsible for the marketing function, were invited to respond via an online self-administered questionnaire. Two samples were involved, the first being a list of 3,500 high network traffic Australian and New Zealand organisations constructed from the top 20 network traffic organisations identified by Hitwise Market Intelligence across 200 industry groupings. The second sample involved a purchased list of 8,500 Australian organisations. Invitations to respond were delivered via a two-sided postcard to sample one, and delivered via personally addressed e-mail to sample two. The same online questionnaire, secured by individual username and password, and employing PostgresSQL database output, was employed with each sample. Eleven-point Likert type scales, and modified Juster scales, were used with the multi-item inventories involved.

The response provided 168 completed questionnaires. It is concluded from non-respondent emails that the combination of computer virus and worm attacks, together with the final introduction of the SPAM Act 2003 in Australia in April 2004, at the time of the study, led to this poor response level. T-tests on demographic items of day one responses (67 per cent) with later responses, found no significant differences, thereby suggesting that there was insignificant non-response bias (Armstrong & Overton, 1977).

JavaScript was employed to prevent item-skipping on nearly all inventories. Where a ‘Don’t know’ category was employed, analysis was undertaken to ensure that no systematic missing data existed. The analysis employing Little’s MCAR test showed that any missing data was missing completely at random (MCAR): Organisational Performance – Three year change ($\chi^2 = 208.24, df = 237, p = 0.91$); Organisational Performance – Change last year ($\chi^2 = 544.48, df =$
637, \( p = 0.99 \) (Hair, Anderson, Tatham & Black, 1998). Estimated means (EM) imputation was employed given the small amount of missing data.

**Analysis, Findings and Discussion**

The study adopted a two-step approach suggested by Anderson and Gerbing (1988) and Kline (1998), whereby each multi-item inventory (e.g., marketing logistics network competency (MLN), online marketing logistics network competency (OMLN), organisational performance (OPD – direct measures such as sales revenue and gross margin, and OPI – indirect measures such as consumer satisfaction and relative perceived quality)), was subjected to confirmatory factor analysis using AMOS 5.0, followed by testing of the relationship between pairs of constructs, before proceeding to an analysis of all constructs involved. The measurement models for MLN, OMLN, OPD and OPI were examined and in each case, the goodness of fit indices showed a good fit of the models to the data, following trimming. The MLN and OMLN manifest variables are identified in Figures 1 and 2, while the trimmed OPD and OPI variables were as follows: OPD – unit sales, market share, gross margin and marketing profit; OPI – competitive market measures, consumer behaviour measures, consumer (end user) measures, direct trade measures, innovativeness, intangible asset measures, perceived quality, and other financial measures.

In the interests of ensuring that the number of cases remained at more than five times the number of parameters when determining the structural equation models, two composite measures of organisational performance (OP) were employed – OPD and OPI. The composite measures used are an aggregate of the summed and factor loading index weighted items following trimming (Kline, 1998).

The structural model concerning MLN and OP illustrated in Figure 1 shows a good fit of the data to the model (CMIN/DF = 0.93, \( P = 0.52 \); AGFI = 0.96, NFI = 0.98, CFI = 1.00, TLI = 1.00; RMSEA = 0.00). When the regression weights are examined, there is a significant relationship between MLN and OP, i.e., OP <-- MLN: C.R. 2.27, \( p = 0.02 \).

Similarly, the structural model concerning OMLN and OP illustrated in Figure 2 shows an acceptable fit of the data to the model (CMIN/DF = 1.97, \( P = 0.14 \); AGFI = 0.94, NFI = 0.99, CFI = 0.99, TLI = 0.98; RMSEA = 0.08). When the regression weights are examined, however, there is an insignificant relationship between OMLN and OP, i.e., OP <-- OMLN:
C.R. 1.75, \( p = 0.08 \). Further analysis using a structural model employing the full inventory of manifest variables, rather than composites, shows that there is an insignificant relationship between OMLN and the measure OPD, i.e., OPD \( \leftarrow \) OMLN: C.R. 1.79, \( p = 0.07 \).

In effect, \( H_1 \) is supported, in that there is a direct influence of traditional marketing logistics network competency on organisational performance using subjective measures. However, \( H_2 \) is not supported, in that there is no direct influence of online marketing logistics network competency on organisational performance evident, when using subjective measures, at this time.

\[
\begin{align*}
\text{e}_1 & \rightarrow \text{servictr} & 0.29 \\
\text{e}_2 & \rightarrow \text{prodinfo} & 0.84 \\
\text{e}_3 & \rightarrow \text{cutlcos} & 0.72 \\
\text{e}_4 & \rightarrow \text{backend} & 0.57 \\
\text{m}_1 & \rightarrow \text{OL Mark LogNet} & 0.28 \\
\text{op}_2 & \rightarrow \text{OL Mark LogNet} & 1.02 \\
\text{opd} & \rightarrow \text{OP} & 0.26 \\
\text{opi} & \rightarrow \text{OP} & 1.05 \\
\end{align*}
\]

**Figure 2. Structural equation model of online marketing logistics networks and organisational performance**

One question which arises from these findings is whether the lack of association is, in part, the result of the variety of industry sectors in evidence, for among other findings, Ambler et al. (2004) observe that industry sector moderates the measures used. Kumar, Subramanian and Yauger (1998) made a similar observation in their health sector study involving the observed direct influence of holding a market orientation and the OP measures they employed, and the influence of moderating variables such as market turbulence. Another issue concerns the extent to which marketing managers are responsible for logistics decisions in many of the organisations sampled.

**Limitations and Further Research**

Given that subjective measures of organisational performance were employed and single respondents within each organisation self-reported, there are limitations with the extent to which the findings might be generalised beyond the immediate sample. While no demographic information has been provided herein, it is of note that 75 per cent of respondents reported revenue in the past year of less than $50 million, indicating that small and medium enterprises dominate this Australasian study. This is in direct contrast to other studies concerning the influences on organisational performance (e.g., Harris' (2001) study, which surveyed larger UK organisations). On the positive side, respondents were the most senior managers who should be familiar with their organisations’ marketing logistics competencies and their organisations' performance measures.

Further studies are needed which examine the direct association between such marketing competencies and organisational performance where both subjective and objective measures are employed (Dawes, 1999). In particular, the study of the marketing mix elements such as marketing logistics network use needs to be extended in order to help substantiate the claims that the marketing function, including marketing logistics network management, adds value to the organisation.
References


