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IS-Marketing Alignment: Its Impacts on Marketing Performance and on Business Performance

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IS-MARKETING ALIGNMENT: ITS IMPACTS ON MARKETING PERFORMANCE AND ON BUSINESS PERFORMANCE

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Abstract

The importance of alignment between information systems and the business has been referred to in both the practitioner literature and in academic research for some years. A number of rigorous studies have ascertained the relevance of IS-business alignment as an important matter. The alignment of information systems with other business functions – such as the marketing function – has been alluded to as well, but not previously empirically examined in depth. This study uses data from 175 large New Zealand companies to show that strategic alignment between IS and marketing can be reliably measured, and that this alignment exerts a significant and material impact on (a) marketing performance, and (b) business performance.

Keywords: information systems, marketing, strategic alignment

1 INTRODUCTION AND LITERATURE REVIEW

There are numerous studies which demonstrate how information technology and/or information systems (IT/IS) has been and can be used to the strategic advantage of an organization and can impact positively on business performance (e.g. Galliers, 1993; Service & Boockholdt, 2000). Similarly, the strategic importance of marketing and its positive impact on business performance has been examined in detail (e.g. Jain, 1997, p. 14; Kotler & Armstrong, 1996, p. 43). In most organizations these two business functions tend to pursue their strategic directions relatively independently (Pender, 2001), linked only by the overarching business strategy (Berthon, Hulbert & Pitt, 1999). The relationship between IS and marketing is sometimes even perceived to be a troubled, or less than optimal relationship (Avital & Vandenbosch, 2000).

On the other hand, some studies have shown that where there is a close link between the two functions, the organization appears to reap the benefits, with notably strong business performance (Fletcher & Wright, 1997; Sashittal & Wilemon, 1994; Murphy, 1999; Winer, 2001). However, these studies focused on specific operational aspects or sub-areas of marketing such as CRM. Furthermore, apart from exploratory studies (Hooper and Van Erkom Schurinck, 2002, 2003) there do not appear to have been any studies which have focused on the *strategic* aspects of linkage between IS and marketing, to examine the impact of that linkage on business performance.

The main research question considered in this paper is:

- What is the impact of the strategic alignment between IS and marketing on business performance?

Within the information systems domain, the concept of strategic alignment has been most prominently addressed with regard to IS and organizational strategies. Studies by Papp (1998), Henderson and Venkatraman (1993) and Tallon and Kraemar (1998) indicated the positive impact of the alignment between IT and business on business performance.

The concept of *strategic orientation* was first introduced by Venkatraman (1985, 1989b). Just as a person has a personality, which consists of a number of aspects (warm/cold, aggressive/passive, etc.), so an organization can be seen as having a kind of ‘organizational personality’. Venkatraman determined seven key aspects which comprise every business’s strategic ‘personality’, the collection of which he termed ‘strategic orientation’. Venkatraman also developed a survey instrument to measure the strategic orientation of a business enterprise (STROBE) (Venkatraman 1989a).

Chan (1992) and Chan et. al. (1997) argued that the principal of strategic orientation could be applied to functional areas within a business, areas such as IS or marketing. In her research, Chan (1992) developed a measure of IS-business strategic alignment, and demonstrated how the alignment of the strategic orientation of the business and the strategic orientation of IS can have a positive impact on business performance.

Borrowing and extending from Chan et al. (1997) and Venkatraman (1989a), we introduce two independent constructs: the *strategic orientation of information systems*, and the *strategic orientation of marketing*. Furthermore, we conceptualize the strategic alignment between IS and marketing as the alignment or fit between these two independent constructs. Details regarding the measurement of the constructs, and the calculation of alignment between them are discussed in Section 3.

2 THE RESEARCH MODEL AND HYPOTHESES

The research model, and hypotheses that follow, are derived from Chan (1992) and Chan et al. (1997).

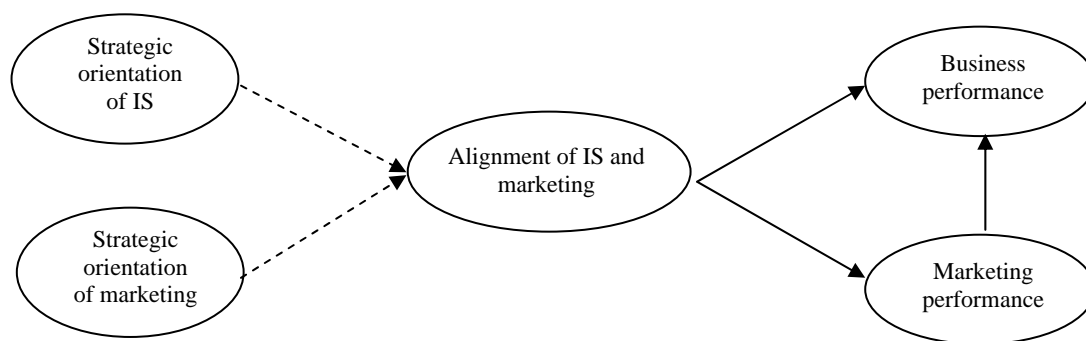


Figure 1. Research model

The literature had clearly illustrated that both IS (e.g. Galliers, 1993) and marketing (e.g. Jain, 1997), each in their own right, exercise a positive influence on business performance. As well, where there is a close link between IT/IS and marketing, albeit not at a strategic level, the impact on business performance is significant (Fletcher & Wright, 1997; Sashittal & Wilemon, 1994). Furthermore, Chan (1992), Chan & Huff (1993) and Chan et al. (1997) had all found a positive impact of the alignment between IS and business on business performance. The first hypothesis argues that alignment between IS and marketing would have a similar effect.

H1: The stronger the alignment between IS and Marketing, the stronger the business performance

Chan (1992), Chan and Huff (1993) and Chan et al. (1997) also all found a positive impact of the alignment between IS and business on IS effectiveness. Therefore it seemed logical to hypothesize that marketing performance would be similarly positively affected.

H2: The stronger the alignment between IS and Marketing, the stronger the marketing performance

Jain (1997), Kotler and Armstrong (1996) and Carrillat, Jaramillo and Locander (2004) all found that marketing performance contributed to business performance. Hypothesis 3 reflects their findings.

H3: The stronger the marketing performance, the stronger the business performance.

3 CONSTRUCT MEASURES

To test the research model and associated hypotheses, three constructs required measurement: IS-marketing alignment, marketing performance, and business performance.

Following Chan (1992), IS-marketing alignment was measured by using Chan's original structure and measurement for IS strategic orientation, and developing a parallel measure for marketing strategic orientation, then comparing the two on an item-by-item basis, as described below. The seven dimensions of IS (and marketing) strategic orientation are:

Aggressiveness:	concerted effort to outperform the competition
Futurity:	a longer term focus
Innovativeness:	innovative and creative approach to offerings and markets
Proactiveness:	constant striving to seize as many opportunities as possible
Risk aversion:	avoiding risk
Analysis:	a cautionary and careful approach
Defensiveness:	a concerted focus on protecting the company's competitive advantage

Business performance appears to be the most frequently used measure of business excellence, productivity or effectiveness (e.g. Kotler, 1977). From the literature it is evident that the measures of business performance fall into four main categories – absolute and relative financial measures, and absolute and relative market measures (Bonoma & Clark, 1988). This suggests that in order for a measure of business performance to be comprehensive, it would be appropriate for it to represent each of these categories.

On the other hand, the four categories of business performance measures also appeared to be frequently used measures of marketing performance (e.g. Rayburn, 1977). This overlap seemed ambiguous but other measures also emerged which focused more on customer-related aspects (e.g. Morgan, Clark & Gooner, 2002) and marketing efficiency (e.g. Vorhies & Morgan, 2003). Customer-related measures, and measures of marketing efficiency were consequently used to measure marketing performance, while the former measures were allocated to the measurement of business performance.

4 RESEARCH DESIGN

A survey approach was adopted to test the hypotheses, and a survey instrument was developed. The instrument included items to measure the three research constructs, as well as a section on demographics.

In order to ensure content validity, it was deemed prudent, where possible, to use scales from instruments which had been validated and found reliable in previous research (Zmud & Boynton, 1991). Chan's (1992) instrument thus served as the point of departure for the dimensions and operationalization of strategic orientation.

Hinkin (1998) has shown that the internal validity of a construct could be achieved with as few as three items. Through a number of iterations, 23 items were decided upon to measure the seven dimensions of strategic orientation, six items were selected to measure marketing performance and business performance respectively, and seven additional items were included to measure key demographic variables.

In each responding organization, two different managers – the IS director, and the marketing director, would be asked to complete a survey questionnaire. Separate versions of the survey instrument were developed for IT managers and marketing managers to complete. Although the heads of IT and marketing would each respond to similar items with regard to the strategic orientation and business performance constructs, only the heads of marketing would answer the questions on marketing performance.

Five point Likert scales were used for the response options to all the independent and dependent variables. Only the few demographic questions required open-ended responses. A number of items were reverse coded in order to reduce response set bias (Hinkin, 1998).

Although most of the proposed items for the questionnaire had been validated in prior research, pre-testing of both versions of the survey instrument was conducted with seven marketing and IS managers. Most respondents found the questionnaire clear and without problems, the only correction needed was to resolve the inconsistent reference to “firm” or “company”.

The physical questionnaire, as well as the questionnaire package, were designed so as to reduce non-response rate. Hard copies of the questionnaire booklet, with brightly coloured covers which aided reminding were despatched, together with a personalized covering letter. Each questionnaire was coded in order to identify the respondent. Although respondents’ names and the names of their companies were requested in the questionnaire, there was a possibility that their writing might not be easily legible, and/or that the company had changed its name or operated under another name than the one under which it was registered. A self-addressed, stamped envelope completed the pack.

5 DATA COLLECTION

The Atlantis 800 Business Directory (2003) and *Top 2003* (New Zealand Management, 2003) were the two sources used for the sampling frame of large New Zealand companies. A random sample of companies was selected. Potential participants were contacted by telephone. No company was included in the sample unless both the heads of IT and marketing agreed to take part. In total, 281 companies (562 individuals) indicated they would participate. Questionnaire packages were then posted to each individual.

Following the guidelines of Dillon et al. (1994), after the initial despatch, there were two main follow-up stages. The first follow-up, a reminder letter, took place three weeks after the initial despatch. The second stage, six weeks after the initial despatch, comprised phone calls to each individual who had not yet responded. In total 415 completed questionnaires were returned – a 74% response rate. However, there were a number of instances where either only the head of IT or the head of marketing responded. In total 175 companies were represented by both the required heads – a 62% company response rate. This was a gratifyingly high responses rate.

As the response rate had been high, overall non-response bias did not pose a significant problem. Furthermore, the almost even number of responses from the heads of marketing and the heads of IT precluded the necessity of weighting the responses of either group in order to balance the input in the analysis (Dillon et al., 1994). In addition, any difference in the numbers of responses would only impact on the first stage of analysis, the factor analysis, because only pairs of responses would be used for the later stages.

6 ANALYSIS

The analysis of the completed questionnaires proceeded in three stages: factor analysis, calculation of alignment, and structural equation modeling.

6.1 Factor Analysis

The objective of the factor analysis was to ensure that the measures used in the second and third stages of the analysis were as valid and reliable as possible. Confirmatory factor analysis was conducted on the strategic orientation measures, and exploratory factor analysis on the dependent constructs of business performance and marketing performance.

In order to ascertain convergent validity and discriminant validity of the factors, the loadings of each item onto the respective factor should be above 0.6 although loadings of 0.5 and above are acceptable for larger samples such as 400 or more (Hair, Anderson, Tatham & Black, 1998). To determine reliability of a factor, a Cronbach's alpha of over 0.6 was required (Hair et al., 1998).

In the analysis of the strategic orientation items, all the items loaded onto the intended factors. Only one 'risk aversion' item demonstrated a loading of less than 0.6 at 0.407. The Cronbach alphas of all factors was over 0.6 except for the 'proactiveness' factor which was very slightly less than 0.6 at 0.59, and the 'risk aversion' factor which was 0.42. The reliability of the 'proactiveness' factor could not be improved by the deletion of any item, and was so slightly below 0.6 that it was deemed acceptable. However, the 'risk aversion' factor was significantly improved to a Cronbach alpha score of 0.7267 by the exclusion of the low loading item. This item referred to risky strategies adopted by the company as opposed to the other items which referred to risk averse strategies. It was thus deleted.

The dependent variables were analysed together. Items all loaded onto their intended factors in terms of the split between business performance and marketing performance, although 'market share gains' cross-loaded onto both variables. This ambiguity was predictable but the stronger loading onto business performance, supported the notion that the item was a more appropriate measure for that variable. The items of business performance all demonstrated high loadings (over 0.7) onto the factor and the Cronbach alpha for the factor was 0.9008.

However, the items for marketing performance split neatly into two factors, one of which reflected the marketing function performance, and the other the effect on customers. Both demonstrated high item loadings onto the factors (over 0.7) and high reliability of the factors (0.8080 and 0.8402 respectively). However, splitting them into two would deny the all-encompassing concept of marketing performance, so it was decided to maintain the single marketing performance factor. This factor also displayed high item loadings (all above 0.7), as well as a Cronbach alpha of 0.9008.

With the deletion of the one 'risk aversion' item, the factor analysis demonstrated both convergent and discriminant validity, as well as reliability of the strategic orientation measure. The Chan (1992) instrument thus received strong support. The newly formed measures of business performance and marketing performance also demonstrated their convergent and discriminant validity, as well as their reliability.

6.2 Calculation of alignment

The second stage of the analysis consisted of the calculation of alignment. The alignment construct consists of a single measure, or index.

Three options emerged as possible means of calculating alignment:

1. The first was to simply use the absolute difference between the scores per item. The rationale was that the difference would imply the lack of alignment and thus the synergy between the two respondents – $|x-y|$
2. Chan (1992) and Chan et al. (1997) had favoured a moderation approach which used the positive product at item level, then the average of these at each dimension – (xy)
3. In order to address the concern that Chan’s (1992) calculation would not accommodate the “anti-synergy” which might result from the IT/IS and marketing respondents’ scores being very different, the following formula, was developed:

$$(4- |x-y|)(x+y)/2$$

As each item of a dimension was considered important, the preferred approach was to calculate the formula at item level first, rather than applying the formula to the average across each dimension.

The third option was chosen but applied to only the 175 pairs of responses, that is, the companies from which both the heads of IT and marketing had responded. The alignment index was calculated as the average score across the alignment on all seven dimensions. The calculated alignment index value thus formed the sole independent variable in the model which would be tested in the next stage of the analysis.

Table 1 presents the descriptive statistics of the various alignment dimensions prior to the final calculation of the alignment index.

Dimension	Minimum	Maximum	Median	Mean	Std dev.
Aggressiveness	0	20.00	14.67	14.42	3.68
Futurity	0	16.50	9.83	9.79	3.09
Innovativeness	0	20.00	11.17	11.15	3.37
Proactiveness	0	17.83	11.00	10.89	2.84
Risk aversion	0	16.00	10.17	10.23	3.11
Analysis	0	20.00	11.00	10.96	3.53
Defensiveness	0	19.00	11.88	11.66	2.92

Table 1. Alignment on strategic orientation dimensions: descriptive statistics

As can be seen, ‘aggressiveness’ emerged as the dimension on which the average score was highest, and ‘futurity’ as the dimension on which the alignment between heads of IT and marketing was lowest. Although this would not affect the assessment of the model, it does provide some indication of the focus of large New Zealand companies.

6.3 Structural equation modeling

The third stage of the analysis consisted of testing the research model. Structural equation modeling (SEM) using Partial Least Squares (PLS) was the specific technique adopted. PLS is a multivariate technique which simultaneously executes both factor analysis and aspects of multiple regression in order to estimate interrelated dependent relationships (Hair et al., 1998, p.583). It also allows path analytic modeling to be performed with latent (unobserved) variables (Chin, 1998).

In the case of this research, the constructs of business performance and marketing performance were comprised of reflective factors, and the construct of alignment was comprised of a single, formative factor – the calculated alignment. Partial least squares analysis, being a components-based approach, accommodates reflective indicators for some constructs in conjunction with formative indicators for others (Chin, 1998). PLS analysis is conducted in two stages: an assessment of the measurement model; and an assessment of the structural model (Compeau & Higgins, 1995). Chin’s PLS-Graph, version 3.0, was used for the analysis.

6.4 Measurement Model

In order to obtain an indication of the convergent validity and the extent to which the reflective factors were internally consistent, the level of their loadings onto their respective constructs was determined, as well as the significance of these loadings. Although loadings of above 0.5 are acceptable (Aubert et al., 1995), they should preferably be above 0.7 (Chwelos et al., 2001).

Normally the same procedure is followed for formative factors, but using weights instead of loadings. The weights need not be as high as those required for reflective factors, and more reliance is placed on the significance of the factors (Tetiawat, 2003). However, as the alignment construct only consisted of one formative factor, this would thus necessarily have a perfect weight of 1.00, and such measurement was superfluous.

The loadings of the reflective factors, as well as their significance, are shown in Table 2. The loadings of the business performance factors were all above the 0.7 level, indicating that these measures all demonstrated convergent validity. In addition, they all achieved a very high significance level (p value <0.001). Most of the loadings for the marketing performance factors were above the 0.6 level, indicating a high level of acceptability. However, the loading of 'return on marketing investment' (ROMI) at 0.4971 was slightly below even the 0.5 acceptability level. On the other hand, all the factors, including 'ROMI', reflected a high degree of significance (p-values <0.001), indicating a high level of confidence in them all. It was thus deemed advisable to retain all the factors of the construct, including ROMI.

	Loading	Significance	t-statistic
Business performance			
Net profits	0.8613	****	22.0405
ROI	0.8572	****	24.8729
Revenue growth	0.8748	****	30.1217
Sales growth	0.8528	****	23.0768
Market share gains	0.7489	****	12.5105
Overall performance	0.9334	****	58.3854
Marketing performance			
Customer satisfaction	0.6919	****	6.0095
Customer retention	0.7931	****	8.7435
Customer loyalty	0.7686	****	7.4148
ROMI	0.4971	****	3.7387
Promotional efficiency	0.6775	****	6.5839
Overall marketing performance	0.8640	****	19.9788

p values **** <0.001, *** <0.010, ** <0.05, * <0.100

Table 2. Alignment on strategic orientation: Loadings of reflective factors

To determine the convergent validity, or internal consistency, of the measures at construct level, the composite reliability coefficient values should be at least 0.3, but the higher the value, the more internally consistent and reliable the measure (Tetiawat, 2003), and the AVE of each construct should be higher than 0.5 (Goo et al., 2004). These values are depicted in the table below. Because alignment only consisted of one factor, determining convergent validity or internal consistency of that construct was inappropriate.

Construct	Composite reliability coefficient	AVE
Business performance	0.943	0.734
Marketing performance	0.866	0.525

Table 3. Alignment on strategic orientation: Composite reliability coefficients and AVE

The composite reliability coefficients of business performance and marketing performance were just above and just under 0.9 at 0.943 and 0.866 respectively, thus indicating that these were highly reliable constructs.

In terms of AVE, both those for the marketing performance and business performance constructs were above 0.5, indicating an acceptable level of average variance of all measures within each construct.

The discriminant validity of the measurement model was determined by examining the correlations between constructs and ensuring that the square root of the AVE of a construct was greater than the correlations between the construct and other constructs (Aubert et al., 1994; Chwelos et al., 2001). These are shown in the Table 4.

Construct	Alignment	Business performance	Marketing performan
Alignment	1.000		
Business performance	0.360	0.857	
Marketing performance	0.264	0.257	0.725

Note: Bold, italicized values are the square root of AVE

Table 4. Alignment on strategic orientation: Inter-construct correlations and square root of AVE

In all instances, the square root of the AVE was greater than the correlations between the other constructs, thus demonstrating the discriminant validity of each of the constructs.

6.5 Structural model

In order to ascertain the model's predictive validity, the strength of the impact of the independent variable upon the dependent variables, and the strength or significance of the paths between the variables, or constructs, was assessed. The strength of the impact was assessed by means of the explained variance in the dependent variable and should be above 0.1 (Chan, 1992), and the paths should be significant (Goo et al., 2004).

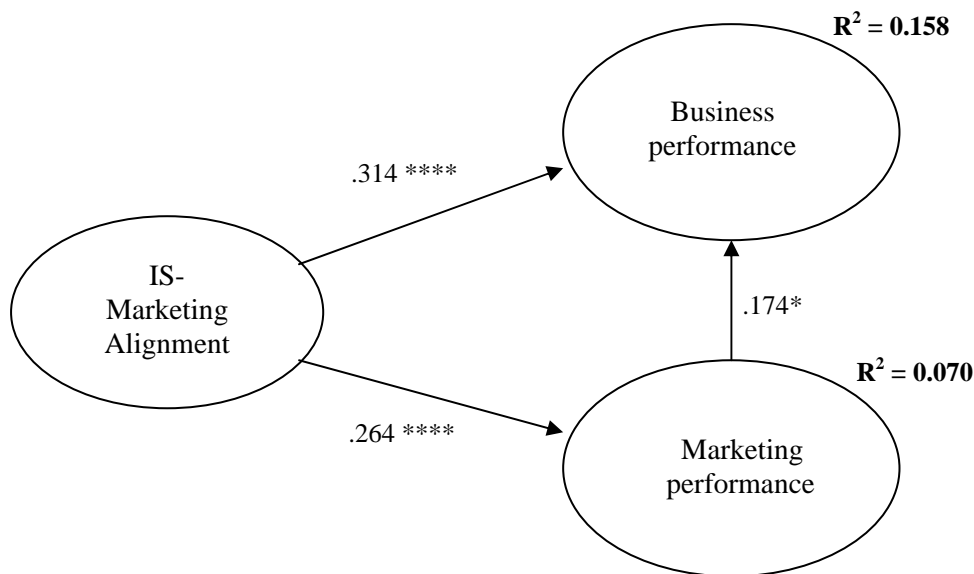


Figure 2. Structural model

As is depicted in Figure 2, the explained variance in business performance was above the 0.1 level, and thus denoted an adequate predictive ability of the model in this regard. In the case of marketing performance ($R^2 = 0.070$), it was below the 0.1 level. It indicated that only 7.0% of the variance in that construct was accounted for by alignment. However, given that many influences, over and beyond the alignment between IS and marketing, impact on marketing performance, this amount of explained variance was understandable and

should not, in and of itself, necessarily suggest inadequacy in the model, especially since the path coefficient from alignment to marketing performance was substantive and highly significant.

In order to assess the significance of the paths between the constructs, a bootstrap procedure was applied. Convergence occurred within six iterations. This is within the acceptable range of up to 20 to indicate how well the model fits the data (Hulland et al., 1996). The paths from alignment to both business performance and marketing performance were both significant with path coefficients of 0.314 (p-value <0.001) and 0.264 (p-value <0.001) respectively. Hypotheses 1 and 2 were thus supported.

The path coefficient between marketing performance and business performance was low at 0.174 but significant at p-value <0.100 level. Hypothesis 3 was thus also supported, albeit less decisively than the other two hypotheses.

In addition, the model was evaluated by examining the Q^2 predictive relevance for the dependent constructs. Q^2 of greater than 0 implies that the model has predictive relevance (Eom, Ashill & Wen, 2006). A blindfolding procedure was employed, using communality measures. The Q^2 of business performance was 0.6191 and that of marketing performance was 0.3261, indicating that the model possessed predictive relevance. This added further support to all three the hypotheses.

7 DISCUSSION

This research developed a parsimonious model which provided positive support for the indications in the literature that alignment between IT/IS and marketing can exercise a positive impact on business performance (Fletcher & Wright, 1997; Sashittal & Wilemon, 1994; Hooper & Van Erkom Schurinck, 2002, 2003). It also extended the work of Chan (1992), demonstrating the robustness of her original approach to the calculation of alignment according to strategic orientation. In addition, the model demonstrated how the alignment could impact positively on marketing performance, as well as on the impact of marketing performance on business performance.

The formula which was developed for the calculation of alignment more accurately captured the nuances of alignment than previous formulae.

The measure for strategic orientation can be regarded as both reliable and valid. With the exclusion of one item and the combination of the two 'defensiveness' dimensions, it lends support to Chan's (1992) measure of strategic orientation. It also supports the application of her measure across two functional areas as opposed to between IS and the business.

The measure of business performance demonstrated reliability and validity. Although the business performance measures were generally clear, the possible ambiguity regarding whether 'market share gains' measure business performance or marketing performance, requires clarification.

The measure of marketing performance can also be regarded as reliable and valid. However, the possible split between customer-related measures and those which focused on marketing efficiency could be further explored. In addition, the lack of clarity found in the literature, regarding the distinction between measures of business performance and marketing performance, needs resolution. This need reflects the concern that Pulendran et al. (2000) expressed regarding the variety of measures used to assess the performance effects of market orientation. Lastly, the fact that ROMI demonstrated a relatively low item loading in the SEM, could indicate the inappropriateness of the item, or else lack of attention to it by companies.

8 CONCLUSION

This research has addressed a matter of consistent concern to all areas of business – that of alignment. It has focused on the alignment between two functions, IT/IS and marketing, which had not been addressed previously at a strategic level.

This paper has reported on the development of a model which concisely captures the relationship between the alignment of IT/IS and marketing and the impact of that alignment on business performance and marketing performance. The model encompasses a measure for alignment which is calculated according to a specially developed formula. The statistical validity of the model was demonstrated using questionnaire data drawn from 175 large New Zealand companies. All three hypotheses were confirmed via analysis of the survey data.

An important feature of this research is the fact that it was cross-disciplinary. This research demonstrated how strategic conceptualizations of one discipline can, indeed, be applied to another – so long as they are true to the research demands of validity and reliability.

Secondly, a valid and reliable instrument is provided according to which companies can assess their marketing strategic alignment.

Clarification is required for the distinction between the measures of marketing performance and business performance. The measure for marketing performance needs to be carefully assessed.

An additional area of future research is an exploration of the relationships between alignment and the individual dimensions of business performance and marketing performance. Another aspect which could be explored is the application of the alignment measure, to exploring alignment between other pairs of functions in the organization. In addition, it might provide even greater insights to explore alignment between more than two functions, for instance, IS, marketing and finance.

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