

IT Outsourcing Success: Revisiting the Measurement of A Multi-dimensional Construct: An Australian Perspective

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Abstract

This paper examines the applicability of three dimensions of IT outsourcing success (Strategic benefits, Economic benefits, Technological Benefits) which have been identified in existing literature, in the Australian context. While a number of studies have identified that IT outsourcing success is a multi-dimensional construct most of the studies have been based in the US and South Korea. Furthermore most of the previous studies have not reported on the multidimensionality of IT outsourcing success in their findings rather reporting of IT outsourcing success as a summated scale. We believe that evaluating and confirming the measurement of IT outsourcing success in Australian context adds to the body of knowledge. Our analysis identified two competing factor models and significant evidence of cross-loading in the two factor and three factor models examined. The results of the analysis show that the three dimensions of IT outsourcing success maybe mixed measures and the technological benefits may actually be interpreted by respondents as a strategic benefit or an economic benefit depending on individual circumstances. However our results overall do provide stronger support for the three factor model when the factor selection was driven by priori theory. Our results also show the degree of unpredictability inherent when using inferential multivariate statistical techniques such as factor analysis. Therefore we believe our work provides a strong argument for testing and confirming measurement models such as IT outsourcing success in a variety of contexts over time to truly confirm the reliability and validity of IS models and theory.

Keywords: IT outsourcing, IT outsourcing success, Strategic benefits, Economic benefits, Technological benefits

1. Introduction

There is little doubt that the outsourcing of information technology services is an issue that affects many Australian companies as it has become a commonly accepted practice. While IT outsourcing has been presented as an activity that is already pervasive, of great benefit and well appreciated by most organisations, there is also significant dissatisfaction with many IT outsourcing arrangements which have not delivered the promised benefits. Major organisations in both the public and private sectors are reconsidering their IT outsourcing

strategies and are now much more selective in what is being outsourced and are evaluating their IT outsourcing arrangements much more carefully.

Organisations are still having difficulties assessing how successful IT outsourcing has been and, paradoxically, this is in part because limited measurable information is available. Beyond this, there are no uniform measures of success or failure, the identification of which is an important task of further research. In the past five years, a significant number of studies have examined IT outsourcing but many of these have are not sufficiently comprehensive to be useful in practice. While there is much to be said for a methodical, cumulative approach, it is likely that much more sophisticated models will emerge than those currently available.

This research used confirmatory factor analysis to evaluate the IT outsourcing success measure developed in an empirical study by Grover, Cheon and Teng (1996) in the USA. Their instrument measuring IT outsourcing success was based on three categories of IT outsourcing benefits – strategic, technological, and economic (Grover, Cheon & Teng 1996).

The rationale for choosing to test out this instrument is that although the measure has been widely used and adapted in a number of subsequent studies (Lee & Kim 1999, Rouse et al 2001, Hajiyev 2004), the few studies have confirmed three dimensions of IT outsourcing success (strategic, economic and technological benefits). Grover, Choen and Teng (1996) examined the effect of the extent of IT outsourcing, service quality, and partnership on the success of IT outsourcing. They found that the abovementioned independent variables had a statistically significant impact on IT outsourcing success for only certain components, namely systems operations, networks and telecommunications, the most commoditised of IT functions (Grover, Cheon & Teng 1996). However, their study did not test the relationships between independent variables and the three dimensions of IT outsourcing success, but rather tested influence of independent variables on a summated measure of IT outsourcing success. In this paper, we report upon the measurement of IT outsourcing success which is one component of a larger study which examines IT outsourcing in its broader context. The objective of this paper is to examine the applicability of the three dimensions of IT outsourcing success in the Australian context. In particular, we are interested in how well strategic, economic and technological benefits of IT outsourcing success hold up in a different national context and with a sample that is not dominated by large organisations. This research critically evaluates the measurement of IT outsourcing success by testing reliability and validity of an existing and relatively well established measure of IT outsourcing success

2. IT OUTSOURCING

After more than a decade of growth in the volume of outsourcing, there is considerable empirical evidence that many companies are not satisfied with the outcomes and many vendors have not achieved the success they had envisaged and indeed many outsourcing vendors finding it difficult to survive (Lacity & Hirschheim 1993; Lacity & Willcocks 2000; Rouse & Corbitt 2002; Seddon et al. 2000). While outsourcing is a relatively established practice, the concept of IT outsourcing success still remains fluid and subject to adaptation and difficult to measure in quantifiable terms. Most studies concerned with the IT outsourcing phenomenon have concentrated on the mechanics of the outsourcing decision and its implementation (Cheon, Grover & Teng 1995; Kern & Willcocks 2001; Kern, Willcocks 2002; King 1994). Few studies have tackled the difficult issues, the measurement of the success of and degree of satisfaction with IT outsourcing (Rouse, Corbitt & Aubert 2001; Seddon et al 2000). Furthermore, there has been a lack of subsequent confirmatory

studies to evaluate reliability and validity of the measurement models of IT outsourcing success developed so far.

3. IT Outsourcing Success

This study examined the Grover, Cheon and Teng (1996) IT outsourcing success scale in the Australian context. The item measures used in this scale are summarised in Table 1 below:

Table 1 - IT Outsourcing Success Dimensions

Dimension	Items in the measure
1. Strategic Success	1) Focus on core competencies 2) Enhanced IT competence
2. Economic Success	1) Access to skilled personnel 2) Enhanced economies of scale in human resources 3) Enhanced economies of scale in technological resources 4) Control of IS expenses
3. Technological Success	1) Reduced risk of technological obsolescence 2) Access to key technologies

Source: Grover, Cheon and Teng (1996)

In addition to these three dimensions, the scale also included an item which measures the overall satisfaction with the benefits obtained from outsourcing of IT. The study of Rouse, Corbitt and Aubert (2001) tested the dimensionality and composition of the IT outsourcing success scale of Grover, Cheon and Teng (1996). They found that IT outsourcing success is indeed, a multidimensional scale. Since, we wanted to test the multidimensionality of IT outsourcing we have not included the item measuring the overall satisfaction with IT outsourcing success in our confirmatory factor analysis of the three dimensions of IT outsourcing. We feel that including an overall satisfaction with the benefits obtained from IT outsourcing would actually cloud the measure of the multi-dimensionality of IT outsourcing success.

3.1 Strategic Benefits of IT Outsourcing Success

The concept of strategic benefits gained from IT outsourcing is underpinned by the theory of core competencies (Prahalad and Hamel, 1990). This theory views an organisation as a portfolio of core competencies rather than a portfolio of business units. Companies assess each competency and define whether it is a 'core' or a 'non-core' competency. Non-core activities are best outsourced while core activities should be retained in-house because the competitive pressures of the modern economy and quickly changing market boundaries make it extremely difficult for diversified companies to capture leadership in a market or a product. Hence, it makes good business sense for an organization to concentrate on its core competencies. (Cross 1995; Prahalad & Hamel 1990; Quinn 1999)

Prahalad and Hamel (1990) identified three key attributes of a core competency:

1. A core competency may *potentially* provide access to multiple markets;
2. A core competency makes a significant contribution to the perceived benefit of the end product; and
3. A core competency is difficult for competitors to imitate.

In the past few years, the strategic value of IT has been questioned and some organisations have come to view IT as a non-core function, a service that is best managed by external

service providers (Lacity, Willcocks & Feeny 1996). Lacity, Willcocks and Feeny (1996) warn that this could be dangerous. Instead of treating IT as either a core or a non-core function, organisations should identify which IT functions represent business value and therefore should be retained in-house and which ones should be outsourced as non-core IT functions. They suggest that this kind of selective outsourcing approach is more effective than total or no IT outsourcing.

This approach is well aligned with the strategic benefits of IT outsourcing success dimension identified by Grover, Cheon and Teng (1996), who argue that strategic benefits depend upon an internal focus on core activities as well as improving overall organizational IT competence. While some IT functions would be outsourced, critical functions are retained and the organisation becomes better at managing the reduced number of functions. Information technology functions could be retained in-house for a number of reasons, all of which might give the organisation a strategic advantage. These might include:

1. IT functions which add value or facilitate customisation.
2. IT functions which differentiate the company.
3. IT functions where security is of critical importance.

3.2 Economic Benefits of IT Outsourcing Success

The economic benefits of IT outsourcing success refers to improvements in economies of scale in human and technological resources and the control of costs associated with IT services delivery. An indirect economic benefit is often higher levels of access to skilled IT personnel (Grover, Cheon & Teng 1996).

For many organisations, the economic benefits is the key factor driving outsourcing (Lacity & Hirschheim 1993; Lacity & Willcocks 1998; Takac 1994). Lacity, Willcocks and Feeny (1996) found that 85 percent of the organisations participating in their study cited cost savings as the major outsourcing success criterion. There is a widespread belief amongst client organisations that IT outsourcing vendors possess better economies of scale in human and technological resources (Lacity & Hirschheim 1993; Takac 1994). Loh and Venkatraman (1992) found that IT outsourcing can yield significant cost reductions and that poor economic performance of internal IT departments often prompts corporate management to outsource IT. Frustrated with raising IT expenditures getting out of control, corporate executives opt for IT outsourcing (Lacity & Hirschheim 1993; Lacity & Willcocks 1998; Lacity, Willcocks & Feeny 1996; Smith, Mitra & Narasimhan 1998). Often, the rationale is to change IT from a capital to operating expense (Lacity & Hirschheim 1993).

3.3 Technological Benefits of IT Outsourcing Success

Technological benefits refer to the attainment of benefits such as reducing the risk of technological obsolescence and improving access to key information technologies (Grover, Cheon & Teng 1996). Client companies often outsource IT in the belief that vendors have access to and are highly skilled in using better technology that is not available in their (clients') own IT departments (DiRomualdo & Gurbaxani 1998; Lacity & Hirschheim 1993). By signing outsourcing deals, client companies can avoid the risk of technological obsolescence as vendor companies are much efficient in being able to provide IT services utilising more up-to-date technology (Levina & Ross 2002; Yesulatitis 1997). Improving technological capability or accessing more and better technology are among the top-cited expectations from IT outsourcing (Cullen, Willcocks & Seddon 2001; Lacity & Willcocks 1998; Seddon, Cullen & Willcocks 2002). The Outsourcing Institute (2001) reports that the

scope of vendor's resources is one of the five major factors that client companies cite as being important in choosing a vendor.

The constant fragmentation of IT into many individual and highly specialised components like networking, programming, and hardware design has made it difficult and expensive for companies to acquire and maintain expertise and new technology. This has further contributed to the growth and uptake of IT outsourcing (Yesulatitis 1997).

4. RESEARCH METHODOLOGY

This study is descriptive in design as it intends to examine a well-established business activity, IT outsourcing, in an Australian context. This research uses an ex post facto or non-experimental design as it was carried out in a natural setting. Complete control of the research variables was neither possible nor desirable. The researcher employed a self-administered mail survey to collect data for this quantitative study. This study is considered a cross-sectional approach because the data collected from the mail survey represents a snapshot of the state of events regarding the success of IT outsourcing in a two-month period in Australia.

The target population for the study involved Australian organisations employing at least 100 people. It was decided to survey only organisations with at least 100 employees as it was felt that after consultation with a number of IT practitioners in management positions in IT, that very small organisations (with less than 100 employees) may make limited use of IT and have limited need to outsource IT. Seddon et al. (2000) in their extensive survey of IT outsourcing practices in Australia and Rouse, Corbitt and Aubert (2001) in their study of IT outsourcing success targeted mostly large Australian organisations. This study, by contrast, examines a wider range of organisations by including SME organisations with at least 100 employees.

Using probability sampling, five hundred corporations were selected from the *Business Who's Who of Australia* which has details of more than 40 000 Australian public and private organisations. Only organisations with 100 or more employees and the contact details for the IT/IS Manager or CIO were selected as it was considered important to target the survey instrument directly at the senior IT/IS manager or CIOs who are most capable to answer a survey about IT outsourcing. Where there was no response from targeted organisations after three weeks, a follow-up survey form was sent out.

The questionnaire used for the mail survey consisted of three major parts. One of these is the measurement of IT outsourcing success which is the focus for this paper. A summary of the items is provided in the previous section in Table 1 (above). The questionnaire required the respondents to rate (on a five-point Likert scale) eight item statements measuring three dimensions of IT outsourcing success. Although the measures were borrowed from earlier studies and their validity and reliability has already been established (Straub 1989), it was important to test their applicability within the research context by pre-testing the questionnaire instrument. A pre-test questionnaire was administered to twenty-two academics (with extensive IT industry experience) which resulted in minor modifications to the wording of some of the questionnaire items.

Confirmatory factor analysis in combination with reliability analysis was used to confirm the reliability and validity of the measurement model and multidimensionality of IT outsourcing success developed by Grover, Choen and Teng (1996) (Coakes & Steed 2004; Hair et al 1998).

5. RESULTS OF THE DATA ANALYSIS

5.1 Response rate

As discussed previously, a sample of 500 organisations was randomly selected from the Business Who's Who of Australia 2003 database. The results of the two survey mail-outs are shown in Table 2.

Table 2 – Summary of Responses after the first mail and follow-up mail out had been completed

Response Details	Number
Total questionnaires sent	500
Undeliverable questionnaires (invalid address or address left organisation)	44
Total Responses received from two mail outs	140
Useable Responses (outsourcing IT to some degree)	75
Unusable Responses (not outsourcing IT)	65

The overall response rate was considered to be acceptable and comparable to other studies on IT Outsourcing (Grover et al. 1996; Seddon et al. 2000; Rouse et al. 2001) because once the sample size was adjusted to account for the large percentage of organisations do not participate in IT outsourcing or the organisations or targeted respondents who were not reachable (ineligibles), the response rate was estimated to be 19.5 percent.

5.2 Demographics of respondent organisations

A brief overview is provided of the demographics of the respondent organisations in terms of the industry sectors represented in the respondent organisations who are outsourcing IT, organisation size and the types of IT functions which were being outsourced (see Table 3 and 4).

Table 3 - Industry Sector of Respondent Organisations

Industry Sector	Frequency	Percent	Valid Percent
Manufacturing	14	18.7	18.7
Retail Trade	12	16.0	16.0
Health & Community Services	8	10.7	10.7
Transport & Storage	7	9.3	9.3
Finance & Insurance	5	6.7	6.7
Agriculture, Forestry & Fishing	4	5.3	5.3
Education	4	5.3	5.3
Government Administration & Defence	4	5.3	5.3
Wholesale Trade	4	5.3	5.3
Electricity, Gas & Water Supply	3	4.0	4.0
Construction	1	1.3	1.3
Property & Business Services	1	1.3	1.3
Other	8	10.7	10.7
Total	75	100.0	100.0

Table 3 shows that the majority of the respondent organisations in this study came from the manufacturing, retail trade, health and community services and the transport and storage industry sectors. However, it should be acknowledged that some industries are heavy users of

IT are under-presented in the sample and namely these include Finance and Insurance and Government and Administration sectors.

Table 4 - Size of Respondent Organisations

Organisational Size	Frequency	Percent	Valid Percent
Small Organisations	51	68.0	68.0
Medium-sized Organisations	9	12.0	12.0
Large Organisations	15	20.0	20.0
Total	75	100.0	100.0

Table 4 shows that the majority of organisations that participated in this study and were involved in outsourcing some or all of their IT functions were SMEs. Hence this study provides insights into SMEs perceptions of IT outsourcing success which has been largely neglected by previous studies of IT outsourcing in the Australian context.

Respondents were asked to indicate which IT functions were outsourced in their organisation. The categorisation of the IT functions outsourced was based on Grover, Cheon and Teng's (1996) five major IT functions – applications development, systems operations, networks and telecommunications, end-user support, and systems planning and management. An additional category - *total IT function delivery*, was added to address cases where an organisation outsources all their IT functions.

The types of IT functions which are outsourced by the respondent organisations are shown in Table 5.

Table 5 – Types and frequency of IT functions outsourced by the respondent organisations

Outsourced IT Function	Count	Percentage of Cases
Networks and Telecommunications	39	52.7
Applications Development	34	45.9
Systems Operations	22	29.7
End-User Support	22	29.7
Systems Planning and Management	11	14.9
Total IT function delivery	4	5.4
Other	8	10.8
1 missing case; 74 valid cases		

Table 5 shows that all five categories of IT functions identified by Grover et al (1996) as being likely candidates for IT outsourcing still figured prominently as the types of IT functions that the respondent organisations had outsourced in this study. Not surprisingly, very few organisations (only 4) are involved in total outsourcing of their IT functions. Our study provides support for the belief that now most organisations are engaged in selective outsourcing of their IT functions.

5.3 Results of Factor Analysis

The data set items for the variable IT outsourcing success were assessed for normality as a prerequisite to conducting factor analysis by examining the graphical distribution of the data for each item and the skewness and kurtosis. The data set items were found to be representative of a normal distribution. A summary of the descriptive statistics used to assess the normality of the items measuring variable IT outsourcing success is shown in table 6.

Table 6 Descriptive statistics assessing the normality of IT outsourcing success items

	N		M		S		K		S	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Strategic-Benefit-2	5.2	.8	5.2	.8	5.2	.8	5.2	.8	5.2	.8
Strategic-Benefit-1	5.3	.7	5.3	.7	5.3	.7	5.3	.7	5.3	.7
Technological-Benefit-1	5.2	.8	5.2	.8	5.2	.8	5.2	.8	5.2	.8
Technological-Benefit-2	5.2	.8	5.2	.8	5.2	.8	5.2	.8	5.2	.8
Economic-Benefit-1	5.3	.7	5.3	.7	5.3	.7	5.3	.7	5.3	.7
Economic-Benefit-2	5.2	.8	5.2	.8	5.2	.8	5.2	.8	5.2	.8
Economic-Benefit-3	5.3	.7	5.3	.7	5.3	.7	5.3	.7	5.3	.7
Economic-Benefit-4	5.2	.8	5.2	.8	5.2	.8	5.2	.8	5.2	.8

The skewness and kurtosis values were within the acceptable absolute range of 2.

5.3.1 Two Factor Model

Factor analysis was conducted using the principal component analysis technique and varimax rotation technique to identify and confirm the validity of the key factors which underpin the latent variable IT outsourcing success in this data set (Straub 1989). We did not include the ninth item from the previous measure developed and adapted by Grover, Cheon and Teng (1996) in our factor analysis as we felt that this item which measured the overall satisfaction with the IT outsourcing was in conflict with our efforts to confirm the three dimensions of IT outsourcing success in the Australian context with a data set consisting largely of SME organisations.

First we ran our factor analysis using the principal components method and used eigenvalues over 1 as the criteria to extract the key factors from the 8 items measuring IT outsourcing success. The results of the factor analysis in table 7 show that, in contrast to the findings of Grover, Cheon and Teng (1996) and Rouse, Corbitt and Aubert (2001), The factor analysis produced consists of two distinct factors (1) Strategic benefits and (2) Economic benefits.

Table 7 Rotated component matrix of two factor model extracted from IT outsourcing success items

	Component	
	1	2
Strategic-Benefit-2	.878	
Strategic-Benefit-1	.746	
Technological-Benefit -1	.659	.387
Technological-Benefit-2	.581	.493
Economic-Benefit-1	.581	.430
Economic-Benefit-2		.860
Economic-Benefit-3		.801
Economic-Benefit-4		.760

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

We argue that the third dimension identified in previous studies, technological benefits of IT outsourcing, may be a confused measure and some items actually belong to the strategic benefits of outsourcing and some items actually belong to the economic benefits of IT

outsourcing. We believe that different perceptions of benefits of IT outsourcing benefits across organisations would explain confusion in the measure. The results in Table 7 shows that the two technological benefits items and one economic benefit of IT item actually cross load on both strategic and economic benefits of IT outsourcing. These items do load more strongly on the strategic benefits of IT outsourcing success dimension. After carefully considering the wording of these three item statements, we believe a strong counter argument could be put forward that these items are more representative of the strategic benefits of IT outsourcing success dimension. These two factors, strategic benefits of IT outsourcing and economic benefits of IT outsourcing success also proved to be reliable and valid measures of IT outsourcing success as shown in table 8.

Table 8 presents a statistical summary of the results of the factor analysis and reliability analysis to assess the reliability and validity of the two factor model of IT outsourcing success.

Table 8 Reliability and validity analysis for dependent variable IT outsourcing – Strategic and Economic Benefits

IT Outsourcing Success variables	Factor loadings	Item to total correlation
Strategic benefits of IT outsourcing success items		
1. As a result of outsourcing your IT to your outsourcing service provider you have been able to refocus on your core business	.740	.514
2. As a result of outsourcing your IT to your outsourcing service provider you have enhanced your ICT competence	.870	.706
3. As a result of outsourcing your IT to your outsourcing service provider you have increased access to skilled IT personnel	.581	.573
7. As a result of outsourcing your IT to your outsourcing service provider you have reduced the risk of technological obsolescence	.650	.638
8. As a result of outsourcing your IT to your outsourcing service provider you have increased access to key IT services	.581	.633
Variance explained 32.45% Cronbach Alpha 0.82		
Economic benefits of IT outsourcing success items		
4. As a result of outsourcing your IT to your outsourcing service provider you have achieved enhanced economies of scale in human resource services	.860	.696
5. As a result of outsourcing your IT to your outsourcing service provider you have achieved enhanced economies of scale in technological services	.800	.659
6. As a result of outsourcing your IT to your outsourcing service provider you have achieved increased control of IT expenses	.760	.622
Variance explained 32.15% Cronbach Alpha 0.81		
Total Variance Explained = 64.6%; Kaiser-Meyer-Olkin measure of Sampling Adequacy = 0.858 Bartlett test of sphericity = 217.811; Significance = 0.000		

All of the items in the two factor model of IT outsourcing success displayed significant factor loadings above the accepted 0.5 factor loading score which indicated the items were valid measures of strategic benefits and economic benefits. However, given that the sample size of usable responses is 75, the factor loadings should be 0.65 or greater to be considered significant. Based on this criteria, there is a strong argument to remove items 3 and 8 from the two factor model which would weaken the model. The cronbach alpha scores of 0.81 and 0.82 respectively indicate that the items loading on strategic benefits and economic benefits are reliable indicators of those constructs. The total amount of variance explained by the two factor IT outsourcing success model is 64.6 percent. The strategic benefits of IT outsourcing

success dimension explains 32.45 percent of the variance in the model and the economic benefits of IT outsourcing success dimension explains 32.15 percent of the variance in the IT outsourcing success model.

5.3.2 Three Factor Model

We then used the statistical program SPSS to extract three factors, basing our selection criteria on priori theory that suggests that IT outsourcing success consists of three factors (Grover, Choen & Teng 1996; Rouse, Corbitt & Aubert 2001). The rotated component matrix with three factors is shown in Table 9.

Table 9 Rotated Component matrix of three factor dimensions extracted from the IT outsourcing success items

	Component		
	1	2	3
Economic-Benefit-2	.846		
Economic-Benefit-3	.792		
Economic-Benefit-4	.753		
Technological-Benefit -1		.789	
Technological-Benefit-2	.336	.774	
Economic-Benefit-1	.324	.637	
Strategic-Benefit-1			.915
Strategic-Benefit-2		.619	.634

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 5 iterations

Table 9 shows the three factor model of IT outsourcing success which indicates three factors which are well aligned with the strategic, economic and technological benefits dimensions of IT outsourcing success identified by Grover, Choen and Teng (1996). However, the issue of cross loadings still exists in the three factor model of IT outsourcing success. Two of the technological benefits of IT outsourcing success items also load on economic benefits of IT outsourcing dimension and one of the strategic benefits of IT outsourcing success items loads very significantly on the technological benefits of IT outsourcing dimension. This provides further evidence that the three dimensions of IT outsourcing success identified by Grover, Choen and Teng (1996) may actually be mixed measures and do not hold up well in the Australian context for SME organizations.

This assertion is supported by a summary of statistical results from the factor analysis and reliability analysis shown in Table 10.

Table 10 Reliability and validity analysis for dependent variable IT outsourcing – Strategic, Technological and Economic benefits

IT Outsourcing Success variables	Factor loadings	Item to total correlation
Strategic benefits of IT outsourcing success items		
1. As a result of outsourcing your IT to your outsourcing service provider you have been able to refocus on your core business	.910	.571
2. As a result of outsourcing your IT to your outsourcing service provider you have enhanced your ICT competence	.630	.571
Variance explained 17.45% Cronbach Alpha 0.73		
Technological benefits of IT outsourcing success		
3. As a result of outsourcing your IT to your outsourcing service provider you have increased access to skilled IT personnel	.630	.507
7. As a result of outsourcing your IT to your outsourcing service provider you have reduced the risk of technological obsolescence	.780	.612
8. As a result of outsourcing your IT to your outsourcing service provider you have increased access to key IT services	.770	.644
Variance explained 27.88% Cronbach Alpha 0.75		
Economic benefits of IT outsourcing success items		
4. As a result of outsourcing your IT to your outsourcing service provider you have achieved enhanced economies of scale in human resource services	.840	.696
5. As a result of outsourcing your IT to your outsourcing service provider you have achieved enhanced economies of scale in technological services	.790	.659
6. As a result of outsourcing your IT to your outsourcing service provider you have achieved increased control of IT expenses	.750	.622
Variance explained 28.02% Cronbach Alpha 0.81		
Total Variance Explained = 74.35.6%; Kaiser-Meyer-Olkin measure of Sampling Adequacy = 0.858; Bartlett test of sphericity = 217.811; Significance = 0.000		

All of the items in the three factor model of IT outsourcing success displayed significant factor loadings above the accepted 0.5 factor loading score which indicated the items were valid measures of strategic benefits, economic benefits and technological benefits of IT outsourcing success. Furthermore, all of the factor loadings in the three factor model were considered to be significant as all of the factor loadings were greater than or very close to 0.65 level recommended by Hair et al 1998, for sample sizes of 70. The cronbach alpha scores were above the acceptable level of 0.70 which indicated that the items loading on strategic benefits, technological benefits and economic benefits were reliable indicators of those constructs.

Collectively, strategic benefits, economic benefits and technological benefits of IT outsourcing success explained 74.356 of the total variance in the IT outsourcing success model which was an improvement on the two factor model. However, economic benefits and technological benefits now explain individually 28 percent and 27.88 percent respectively of the IT outsourcing success model while the strategic benefits now only explained 17.45 percent of the IT outsourcing success model. Economic benefits and technological benefits have become the two dominant factors in the three factor IT outsourcing success model.

This is in contrast to the two factor model where strategic benefits and economic benefits of IT outsourcing success explained 32.45 percent and 32.15 percent respectively of the total

variance in the model. This may also be explained by the dominance of SME organizations in the data set who may be more concerned with gaining economic and technological benefits from the outsourcing of IT. Hence the three factor model explains more of the variance in IT outsourcing success and the factor loadings are more significant overall indicating greater power in the three factor model.

6. Conclusions and Implications

We found that the three dimensions of IT outsourcing success identified by Grover, Cheon and Teng (1996) held up when applied to a different context (time and type of organisation) and a different national setting. A two factor model naturally emerged from the factor analysis when eigenvalues over 1 are used as the selection criteria. When priori theory used as the selection criteria to extract three factors, the factor analysis provides stronger confirmatory support for three dimensions of IT outsourcing success model identified by Grover, Choen and Teng (1996). The variance explained by the three factor model increases significantly overall and the factor loadings are more significant indicating greater explanatory power in the three factor model. However, there is still significant cross loading between the three factors and the lower cronbach alpha scores indicate there maybe reduced reliability in three factor model of IT outsourcing success when compared with the two factor model.

Those items which Grover, Cheon and Teng classified as technological benefits actually loaded on the economic benefits of IT outsourcing success in our two factor model. The cross factor loadings on the economic benefits are not very strong for the technological benefits of IT outsourcing success but for the strategic benefits of IT outsourcing success were well above the acceptable level for establishing validity. Therefore at the very least, there is some indication that strategic benefits, economic benefits and technological benefits of IT outsourcing success are highly inter-related. Furthermore, the results indicate that the eight items of Grover, Choen and Teng's model are a good overall measure of IT outsourcing success. We believe there may be some difficulty in separating the dimensions because of the variance in both perception and reality across organisations regarding the benefits obtained from successful outsourcing of IT.

That we were able to obtain two relatively reliable and valid competing factor models (a two factor model, and a three factor model) from the results of our factor analysis does not lead us to challenge the reliability and validity of the Grover, Cheon and Teng (1996) three dimensional IT outsourcing success model. Our results show that there is an element of unpredictability regarding the results of inferential multivariate statistics such as factor analysis when testing and confirming measurement models due to the variance that occurs from one sample to another from many different reasons such as nationality, organisation size and industry. However, the results of our factor analysis which confirms Grover, Choen and Teng (1996)'s three dimensions of IT outsourcing success model supports our contention that more work should be done in the Information Systems discipline in order to confirm the validity and reliability of established models across a variety of contexts. We believe that there is value in retesting well established Information systems models with a number of different samples, in different contexts, over time, in order to ascertain whether a model really does hold up as a valid and reliable measure.

We concede that our study was not specifically targeted on solely measuring IT outsourcing success, but neither were the studies of Grover et al (1996) and Lee and Kim (1999). Our sampling technique yielded a preponderance of SME organisations and a different

distribution of respondent organisations across industry sectors. This may explain the differences in our findings to previous studies which have tended to concentrate on medium to large organisations and their respondent organisations were distributed in a slightly different range of industry sectors, and were conducted in an earlier time. We argue that our results do suggest that further examination of the Grover et al (1996) IT outsourcing success model in a variety of contexts was warranted. In particular, it would be interesting to see whether a current Australian study of IT outsourcing success with a greater number of respondents and which is more representative of large organisations will yield a two factor model or a three model or possibly a four factor model?

7. References

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