

行政院國家科學委員會專題研究計畫 成果報告

結合供應鏈觀點與消費者市場區隔變數探討行動通信服務 品質之改善策略 研究成果報告(精簡版)

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行政院國家科學委員會補助專題研究計畫

成果報告
 期中進度報告

計畫名稱：結合供應鏈觀點與消費者市場區隔變數探討行動通
信服務品質之改善策略

計畫類別： 個別型計畫 整合型計畫

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中文摘要

本計畫將供應鏈觀點導入服務業之品質管理中，以建構以服務鏈整合品質為主體之中介關係模式，並藉此探討服務業之供應鏈整合策略與顧客忠誠度間之影響關係。為此，本計畫首先整合行動電話、行動通訊、行動增值服務發展行動通訊服務鏈整合品質之評估量表以及轉換函數，以估算透過行動通訊服務鏈整合所獲得之品質績效，其次再採用結構方程模式進行關係模式之驗證，以釐清關係品質以及轉換成本之中介效果。研究結果顯示，不論就上游供應鏈整合模式或是下游供應鏈整合模式而言，關係品質以及轉換成本均對於忠誠度具有顯著之影響效果，然唯有透過下游供應鏈整合所獲得之整合性品質，對於關係品質以及轉換成本之建立具有正向影響效果。綜合上述，本計畫所發展之整合性品質轉換函數，可為未來相關研究於進行整合性品質績效之判別上，提供更進階之決策法則，且本計畫所獲得之研究發現亦可作為未來服務業者檢視供應鏈整合策略有效性時之參考依據。

關鍵詞： 供應鏈整合、市場區隔、服務品質、行動通訊、結構方程模式

ABSTRACT

The aim of this study is to propose a supply chain integration (SCI) mediated model to investigate the effects of SCI strategies on customer loyalty in the mobile telecommunication industry. A scale for measuring the integrated service quality resulted from the corporation of different supply chain partners, such as phone manufacturer, telecommunication service provider, and internet and value-added service provider, is developed. Then a quality function is proposed for measuring the supply chain integrated quality. Finally, the structural equation modeling method was adopted for analyzing two types of supply chain modes: upstream and downstream integration. The statistical results validate the direct significantly influences of relationship quality and switching cost on loyalty for both integration modes. While the mediated effect of relationship quality and switching cost on the SCI-loyalty relationship was supported in the downstream integration mode but not in the upstream integration mode. Overall, the proposed integrated quality function could be useful for evaluating the SCI effectiveness, and the mediated model could serve as a valuable tool for managers to assess and improve their current supply chain operations to achieve customer loyalty in the mobile telecommunication industry.

Keywords: *supply chain integration, segmentation, service quality, mobile telecommunication industry, structural equation modeling*

1. 前言

自 1997 年國內行動電話開放民營後，市場版圖不再由國營業者獨佔，行動通訊服務產業因此邁入公平競爭的市場環境。加上近年來，民眾對於行動通訊服務需求的大幅提升，以及資通訊技術之快速變革，行動通訊市場的競爭更趨近於白熱化。此外，於政府推動電話號碼可攜服務後，不僅大幅降低消費者之轉換障礙，亦使得消費者掌握更大的議價能力。因此，為了維持消費者的忠誠度以穩固行動通訊市場之市佔率，與行動通訊服務鏈之上下游夥伴建立緊密的合作關係以發展整合性服務，儼然為目前行動通訊服務業者積極擴展的策略方向。一般而言，行動通訊服務之供應鏈體系大致上是由行動電話製造商、行動通訊服務業者、網路服務提供者、增值服務提供者以及終端消費者所形成(如圖 1 所示)；其中，向上整合係指藉由與行動電話製造商的合作，提供消費者先進以及優惠的行動電話與匯率選擇方案；而向下整合則在於透過網路服務的開通並結合行動通訊服務，所提供之行動增值服務(如：行動銀行、行動商務等)。

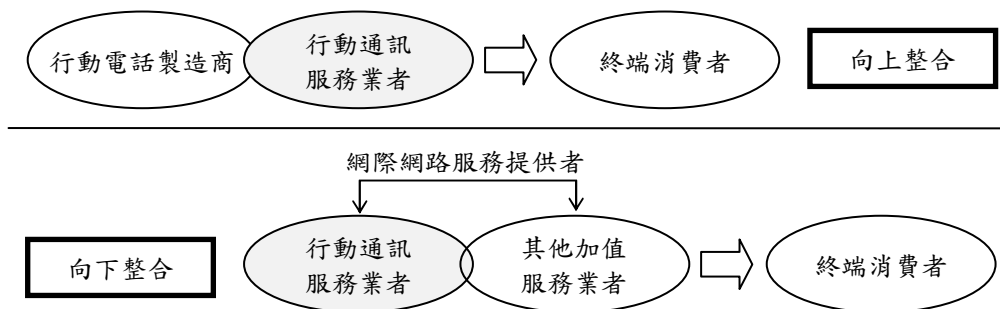


圖 1 行動通訊服務鏈整合型態

由此可知，行動通訊業者所採用之上、下供應鏈整合策略，主要目的均在於彈性因應不同市場區隔之消費者需求，且透過與供應鏈夥伴之整合亦有助於行動通訊服務業者強化內部服務品質。回顧相關文獻可知，多數學者均著重於探討製造業之供應鏈整合策略，以及對於企業績效之影響(e.g., Flynn, Huo & Zhao, 2010; Narasimhan & Kim, 2002)。相較之下，有關於供應鏈整合觀點被應用於服務業管理策略之相關研究仍相當有限。因此，本計畫之主要目的在於應用製造業供應鏈整合之觀點，探討行動通訊服務業透過不同供應鏈整合策略所產生之「整合性服務品質」績效，以及其是否有助於提升消費者忠誠度。

就前者而言，「整合性服務」之形成需仰賴各供應鏈夥伴提供不同的服務項目，因此消費者對於整合性服務之品質認知，應考量各供應鏈夥伴之服務績效表現。藉此，本計畫欲根據目前行動通訊供應鏈整合之策略內涵，發展有助於評估消費者對於「整合性服務」品質績效之評估量表以及轉換函數。另一方面，根據 Heskett, Jones, Loveman, Sasser and Schlesinger (1994)所提出之服務利潤鏈(service-profit chain, SPC)可知，服務品質之優劣並非決定消費者忠誠度之直接因素，而此論點亦被後續研究廣泛採用於探討行動通訊服務品質之相關議題(e.g., Deng, Lu, Wei & Zhang, 2010; Liu, Guo & Lee, 2010; Theoharakis, Sajtos & Hooley, 2009)。綜合過去相關研究，學者指出消費者忠誠度之呈現，取決於服務品質是否能夠有效反映出消費者對於關係品質(e.g., Caceres & Pappas, 2007; Rauyruen & Miller, 2007)以及轉換成本(e.g., Balabanis, Reynolds & Simintiras, 2006; Deng et al., 2010)的認知。因此，就後者而言，本計畫

欲以 SPC 為理論架構，藉以探討關係品質與轉換成本於服務鏈整合品質與消費者忠誠度影響關係間所扮演之中介角色。

2. 文獻探討

2.1 服務利潤鏈

在關係市場架構下，維持甚或提升消費者之忠誠度，被視為企業長期經營之主要目標之一。一般而言，具有忠誠度之消費者較願意與企業維持長期之合作關係，且不易受競爭者之服務或產品相關績效表現影響，因此可以為企業帶來穩定的收入(Gustafsson & Johnson, 2004)。換言之，相較於忠誠度較低之消費者，高忠誠度之消費者具備與企業合作共同發展高價值服務或產品之意圖。而「服務利潤鏈(SPC)」則是由 Heskett et al. (1994)所提出，用以連結企業活動、消費者認知以及企業績效間之互動關係。近年來，採用 SPC 架構做為探討服務品質與消費者忠誠行為相關議題之研究相當多。如 Kamakura, Mittal, de Rosa and Mazzon (2002)於研究中延伸 SPC 之基本概念，並整合量化分析以及 DEA 方法，探討銀行服務業之服務策略以及對消費者認知與行為意圖之影響，研究結果顯示，服務業者對於人員或設備之投入所產生之內部營運績效，對於消費者之滿意度具有決定性之影響，而此作用將進而影響消費者之忠誠度。而 Yee, Yeung and Cheng (2010)亦認為縱使企業具備提供高品質服務之能力，然而當服務之呈現無法讓消費者感到滿意時，消費者仍可能轉換至其他服務業者。就本計畫而言，服務品質概念將延伸至「整合性服務品質」，以反映行動通訊服務供應鏈整合之內涵。因此，綜合上述相關研究，本計畫首先提出以下研究假設：

H1：行動通訊服務鏈之「整合性服務品質」越高，則消費者對於行動通訊服務業者之整體滿意度就越高。

H2：消費者對於行動通訊服務業者之整體滿意度越高，則其忠誠度就越高。

另一方面，亦有研究認為服務品質之優劣可能直接影響消費者之忠誠度。如 Jayawardhena, Souchon, Farrell and Glanville (2007)於研究中發現，於 B2B 之市場環境中，服務品質之高低與忠誠度之呈現具有正向影響關係。Deng et al. (2010)則以行動簡訊服務為研究個案，探討影響消費者滿意度以及忠誠度之決定性因素，研究結果指出服務品質對於忠誠度之解釋力高於其他影響因素。此外，Boohene and Agyapong (2011)亦於探討 Ghana 之行動通訊產業時發現，當服務品質越高，消費者對於企業之忠誠度就越高。因此，本計畫提出下列研究假設：

H3：行動通訊服務鏈之「整合性服務品質」越高，則消費者對於行動通訊服務業者之忠誠度就越高。

2.2 關係品質之中介效果

關係品質係指消費者對於與企業維持長期契約關係之整體評價，其主要目的在於協助企業解釋如何強化現存之契約關係，以及如何將一般消費者轉變為忠誠消費者(Dwyer, Schurr & Oh, 1987)。關係品質一直以來均被視為有效預測消費者忠誠度之關鍵因素：Fullerton (2005)曾透過研究指出，當消費者願意承諾與企業維持長期關係時，則表示消費者具有較高之忠誠度。Wong and Sohal (2006)亦認為若企業能夠確保所提供之服務水準，使得消費者願意維持長期交易關係時，則有助於提升消費者對於企業之忠誠行為，如再購意願、正面宣傳等。此外，Liu et al. (2011)更進一步指出，當企業具備提供高服務品質之能力時，則消費者對於企業之信任程度就越高，此時，消費者會具有較高的意願與現有合作企業繼續維持合約關係。因此，本計畫提出下列研究假設：

H4：行動通訊服務鏈之「整合性服務品質」越高，則消費者對於行動通訊服務業者之認知關係品質就越高。

H5：消費者對於行動通訊服務業者之認知關係品質越高，則其忠誠度就越高。

2.3 轉換成本之中介效果

轉換成本係指消費者為了轉換服務提供者所需額外付出之時間、心力或需承擔之財務風險(Dick & Basu, 1994)。一般而言，轉換服務提供者通常伴隨許多不確定因素，因此轉換成本常被視為影響忠誠度之關鍵因素(e.g., Kim, Park & Jeong, 2004; Fullerton, 2005)。換句話說，增加消費者對於轉換服務提供者之認知風險，或對於重新建立關係契約之困難度，均有助於提升消費者與現有服務提供者繼續維持合作關係之意願(Deng et al., 2010)。另一方面，Jones, Mothersbaugh and Beatty (2000)透過成本—收益模型指出，消費者對於行動通訊服務業者之忠誠行為表現，取決於轉換行為所產生之效益以及成本間之差距；亦即當消費者給予現有服務之評價高於轉換服務提供者所需負擔之成本時，則消費者便會選擇與現有企業維持合約關係。而Lee, Kim, Lee and Park (2006)亦於研究中指出，轉換成本來自於消費者對於服務經驗累積之正面評價，換言之，提升消費者對於服務之整體滿意度有助於建立其轉換障礙，此時為了避免轉換服務提供者可能產生之非預期風險，消費者將願意與現有服務提供者維持合約關係。綜合上述，本計畫提出以下研究假設：

H6：消費者對於行動通訊服務業者之整體滿意度越高，則其所認知之轉換成本就越高。

H7：顧客對於行動通訊服務業者之知覺轉換成本越高，則其忠誠度就越高。

3. 服務鏈整合性品質評估模式

本計畫初步根據目前台灣行動通訊服務營運模式擬定兩種供應鏈整合型態(參見圖 1)；其一為由行動通訊服務業者與上游行動電話供應商合作所提供之一般行動通訊服務鏈，其次為透過行動通訊服務業者與下游服務業之合作，並以網際網路為媒介所提供之行動增值服務鏈。由於不同行動通訊供應鏈係由不同供應鏈夥伴組合而成，因此「整合性服務品質」之衡量應考量各供應鏈夥伴之品質績效以及對於所屬供應鏈之貢獻度。藉此，本計畫採用驗證性因素分析之因素負荷量做為「供應鏈整合性服務品質」之估算基礎。詳細轉換函數茲分述如下：

1. 估算供應鏈夥伴(如行動電話製造商、行動通訊服務業者、網際網路與其他服務提供者)之個別品質績效：本計畫首先將供應鏈夥伴之品質績效($F^{(k)}_i$)定義為第 i 位消費者對於第 k 個供應鏈夥伴之認知服務品質與因素負荷量之總乘積；假設 $i (=1, 2, \dots, n)$ 表受訪人數， $j (=1, 2, \dots, m)$ 表示欲估算供應鏈夥伴所提供之服務項目，而 p_{ji} 即為第 i 位消費者對於第 j 項服務項目之認知服務品質。

$$F^{(k)}_i = \lambda_1 \times p_{1i} + \lambda_2 \times p_{2i} + \lambda_3 \times p_{3i} + \dots + \lambda_m \times p_{mi} \quad (1)$$

其中， λ 表一階因素負荷量。而第 k 個供應鏈夥伴之總品質績效值，則可由以下公式求得：

$$F^{(k)} = \sum F^{(k)}_i / n \quad (2)$$

2. 估算行動通訊供應鏈之「整合性服務品質」：整合性服務品質(SSC_t)之估算是由上階段中所求得之供應鏈夥伴品質績效之累積；估算公式如下：

$$SSC_t = \Pi F^{(k)} \quad (3)$$

4. 研究設計

4.1 資料蒐集

本計畫採用便利抽樣法進行資料收集。而為了提升有效問卷之回收率並將低共同方法變異誤差，本計畫採用 Podsakoff and Organ (1986)之建議，讓問卷填答者可選擇隨即進行問卷填寫，或是於填寫完畢後透過電子郵件將問卷回覆給研究人員。由於本計畫之研究目的在於了解服務鏈整合性服務品質對於顧客忠誠度之影響，因此於填答過程中，填答者必需先定義所評估之行動通訊服務鏈成員。最後，刪除無效問卷後，針對上游供應鏈整合部分所回收之有效問卷共計 158 份；而針對下游供應鏈整合部分所回收之有效問卷共計 130 份。

4.2 問卷設計

忠誠度：根據 Gustafsson and Johnson (2004)之定義，忠誠度之衡量應包含情感忠誠以及行為忠誠兩部分；其中，情感忠誠係指消費者對於產品或服務消費經驗所產生之心理反應或信念，而行為忠誠則是因為消費者之情感狀態所呈現之具體行為表現。藉此，本計畫將忠誠度定義為消費者因為過去經驗而產生之正向態度或重複購買行為，並發展出 5 項衡量指標。

關係品質：綜合過去相關研究(e.g., Dick & Basu, 1994; Garbarino & Johnson, 1999; Liu et al., 2011)，本計畫將關係品質定義為包含信任以及承諾之多構面研究變數。其中，信任表示消費者對於企業未來績效表現之關注與依賴程度，於此部份本計畫共發展 5 項衡量指標；而承諾則指消費者對於與企業維持長期關係之意願，於此部份則以 3 項指標予以衡量。

轉換成本：本計畫採用 Kim et al. (2004)之觀點，以損失成本、適應成本、移入成本做為衡量指標之發展基礎。其中，損失成本係指消費者對於轉換服務提供者所認知之社會地位或性能損失；適應成本則指消費者為了轉換服務提供者，而於資訊搜尋、交換、評估等方面所付出之時間或心力；而移入成本表示轉換服務提供者所伴隨之經濟損失。本計畫於此部份共發展 7 項衡量指標。

供應鏈整合品質：由於本計畫所定義之行動通訊服務鏈係由不同服務鏈夥伴所組成，因此於「服務鏈整合品質」之衡量方面，將透過行動電話品質、行動通訊服務品質、行動增值服務品質三面向進行綜合評估。於行動電話品質方面，本計畫採用 Garvin (1987)之觀點，以性能、特色、一致性、可靠性、耐久性、售後服務、美觀度與顧客知覺品質等 8 大構面做為衡量依據；於行動通訊服務品質方面，本計畫考量行動通訊產業之特殊性，因此採用 Aydin and Özer (2005)之研究做為衡量依據，相關衡量指標共計 11 項；最後，於行動增值服務品質方面，考量網際網路為增值服務傳遞之主要媒介，因此本計畫以 Davis (1989)於技接受模式中所提出之知覺便利性以及知覺有用性兩構面為基礎，共發展 6 項衡量指標。

4.3 信度與效度分析

本計畫採用驗證性因素分析(confirmation factor analysis)做為潛在變數信度與效度檢測之依據。分析結果顯示，於向上整合之研究架構中，各潛在變數之 Cronbach's α 介於 0.786 至 0.930 之間，而於向下整合之研究架構中，各潛在變數之 Cronbach's α 則介於 0.795 至 0.937 之間，顯示測量變數具有高度之內部一致性(Nunnally, 1978)。此外，就結構信度而言，除了向下整合研究架構中之移入成本外，其餘潛在變數之結構信度值均高於 0.6，顯示各潛在變數亦具備良好之結構信度(Bagozzi & Yi, 1988)。

其次，本計畫於收斂效度之檢測方面係採用標準化之因素負荷量是否顯著高於 0.4 做為判斷依據(Bagozzi & Yi, 1988)。分析結果顯示，於向上整合之研究架構中，各衡量變項之標準化因素負荷量介於 0.42 至 0.95 之間，而於向下整合之研究架構中，各衡量變項之標準化因素負荷量介於 0.45 至 0.94 之間，且均達顯著水準。因此顯示兩組樣本均具有良好之收斂效度。

此外，於區別效度部分，本計畫採用 Hair, Anderson, Tatham and Black (2006)所提出之法則，依序檢測兩兩潛在變數非受限模式以及受限模式之卡方差是否具顯著差異。分析結果顯示，所有卡方差均達顯著水準，而具備良好之區別效度。

5. 實證研究結果

本計畫首先採用結構方程模式(structural equation modeling)針對向上整合模式進行路徑分析。分析結果顯示(如圖 2)，整體模式之適配度適中($\text{Chi-square} = 284.67$ ($df = 59$), $\text{RMSEA} = 0.156$, $\text{CFI} = 0.89$, $\text{NFI} = 0.87$)。路徑分析結果則顯示透過向上整合所獲得之整合性服務品質對於消費者之滿意度以及忠誠度均無顯著影響。因此研究假設 1 與研究假設 3 不成立。另一方面，研究發現透過向上整合所獲得之整合性服務品質不僅對關係品質具有顯著之正向影響($\beta = 0.42$, $p < 0.01$)，且會進一步影響消費者之忠誠度($\beta = 0.47$, $p < 0.01$)，因此研究假設 4 與研究假設 5 均成立。再者，結果顯示消費者之滿意度對忠誠度不具直接之影響，但轉換成本於消費者滿意度與忠誠度之影響關係中卻呈現完全中介效果($\beta = 0.73$, 0.34 , $p < 0.01$)。因此研究假設 6 與研究假設 7 是成立的，但研究假設 2 是不成立的。

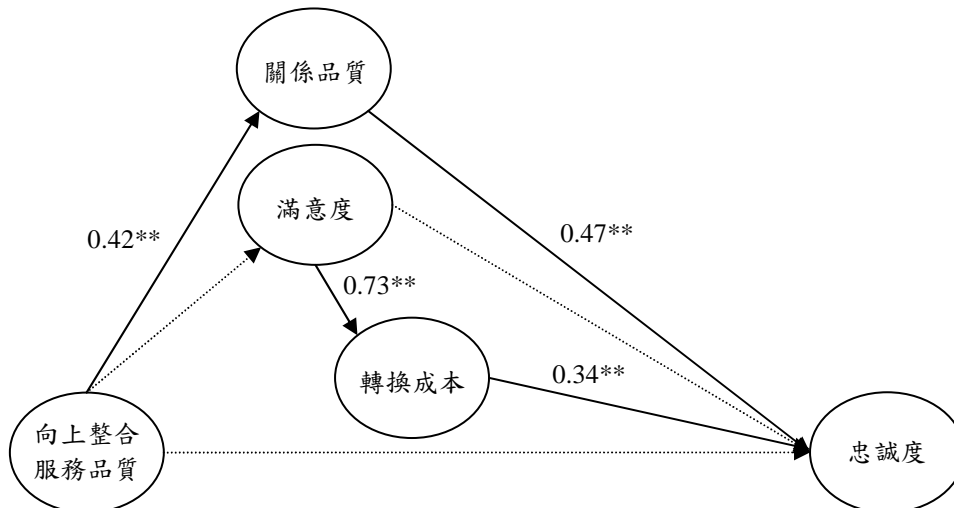


圖 2 結構方程模式分析結果—向上整合供應鏈模式

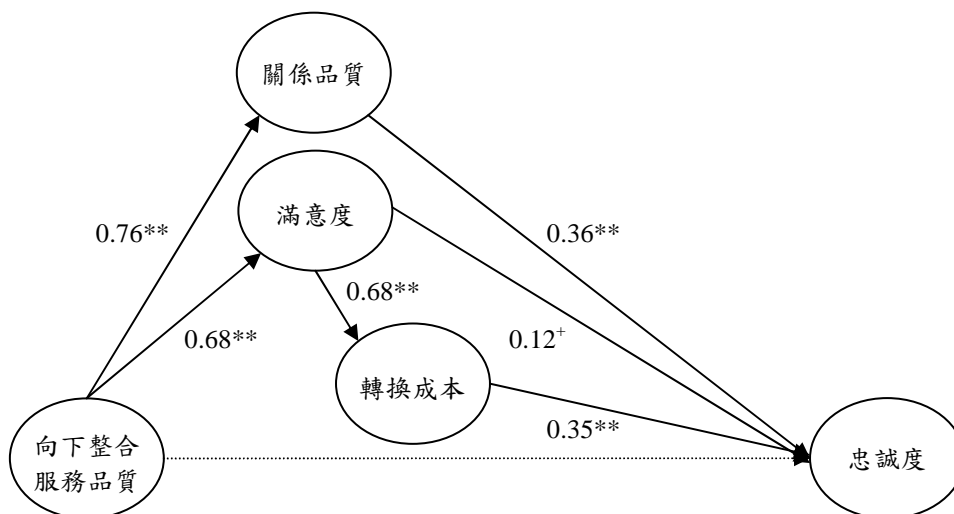


圖 3 結構方程模式分析結果—向下整合供應鏈模式

就向下整合部分，分析結果顯示整體模式之適配度佳($\text{Chi-square} = 206.01$ ($df = 48$), $\text{RMSEA} = 0.160$, $\text{CFI} = 0.92$, $\text{NFI} = 0.91$)。根據結構方程模式分析結果可知(如圖 3)，於七項研究假設中，共有六項研究假設獲得成立；其中路徑分析結果顯示，透過向下整合所產生之整合性服務品質對於滿意度($\beta = 0.68$)以及關係品質($\beta = 0.76$)均具有顯著之正向影響，但對忠誠度之影響則未達顯著水準，因此研究假設 1 與研究假設 4 均成立，但研究假設 3 不成立。其次，結果顯示關係品質對忠誠度具有顯著之正向影響($\beta = 0.36$)，因此研究假設 5 成立。此外，研究發現轉換成本於滿意度與忠誠度之影響關係中呈現部分中介效果；其中滿意度對忠誠度之直接影響程度為 0.12，而透過轉換成本對忠誠度所呈現之間接影響程度則高達 0.24 ($= 0.68 \times 0.35$)，因此研究假設 2、研究假設 6 以及研究假設 7 均成立。

6. 研究結論與建議

隨著全球化服務市場競爭力急遽增加，供應鏈整合已成為產業取得競爭優勢之主要管理趨勢(Kim, 2009; Peppard & Rylander, 2006)。有鑑於過去相關研究多偏重於探討製造業之供應鏈整合實務，本計畫之主要貢獻之一便在於延伸製造業供應鏈管理之概念，探討行動通訊服務業所採用之供應鏈整合策略對於消費者忠誠度之影響。因此，本研究透過服務利潤鏈之觀點，建構行動通訊服務鏈整合性服務品質、關係品質、轉換成本與忠誠度之中介關係模式，期望藉此提供行動通訊服務業者做為未來採用供應鏈整合策略以提升消費者忠誠度之參考依據。而就向上或向下整合路徑模式，其分析結果均顯示關係品質以及轉換成本對消費者忠誠度具有顯著之直接影響效果，且關係品質之影響程度均高於轉換成本。由此可知，相較於提高消費者之轉換障礙，維持緊密的合作關係對企業之永續經營具有較高的影響力(Kim et al. 2004; Fullerton, 2005; Deng et al., 2010)。

另一方面，分析結果發現行動通訊服務業者透過向上整合所獲得之整合性服務品質對於關係品質、滿意度以及忠誠度均無顯著影響，反之，透過向下整合所產生之品質效益均達顯著水準。由此可知，相較於行動通訊服務業者所提供之行動電話與優惠匯率選擇方案，消費者認為發展多元化的加值服務以提升生活便利性以及品質更為重要。此發展趨勢可能源自於行動電話與優惠匯率方案策略並無法有效區隔服務業者以及競爭者；反觀加值服務之推動，不僅需借助網際網路之應用，亦需與其他服務業者規劃符合消費者需求之服務項目，因而提升了整合性服務之核心價值。再者，隨著 3G 行動電話之普及化，行動加值服務市場儼然成為目前行動通訊服務業者積極拓展的目標。此發現亦可於過去供應鏈整合之相關研究中獲得證實；亦即供應鏈之向下整合有助於企業更貼近顧客之真實需求，因此當企業具備彈性變更之能力時，即可快速因應顧客之動態需求而取得市場先機。因此，若行動通訊服務業者能與網際網路服務提供者以及下游服務業者維持長期且緊密之合作關係，並設法簡化行動加值服務之使用程序，或強化行動加值服務對消費者所產生之實質效益時，將有助於提升消費者與行動通訊服務業者間之關係品質，以及消費者對於行動通訊服務業者之滿意度，並可進一步建立消費者之轉換成本以穩固其忠誠意圖以及行為。

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8. 計畫成果自評

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估

達成目標

未達成目標

說明：有鑑於近年來行動通訊服務業之急劇成長，以及供應鏈整合概念對於持續性管理之重要性，本計畫之主要目的在於透過供應鏈觀點，建立行動通訊「服務鏈整合品質」與顧客忠誠度之關係模式。再者，為了有效衡量「服務鏈整合品質」，本計畫除發展行動通訊服務鏈品質量表外，更進一步建立服務鏈整合品質之轉換函數。另一方面，有鑑於現階段行動通訊服務業為因應不同區隔市場之消費者需求所發展之供應鏈整合型態，本計畫更進一步針對不同服務鏈型態下之整合品質進行探討，期望藉此釐清服

務鏈整合之實施效益，以做為未來協助行動通訊服務業者提升顧客忠誠度之參考依據。而研究結果顯示，行動通訊服務業者所採用之兩種供應鏈整合策略對於關係品質、轉換成本以及顧客忠誠度之建立，均具有不同之影響效果。因此，本計畫建議服務業者於擬定服務鏈整合策略時，必需先行確認其可能伴隨之實質效益與策略目標間之一致性。簡言之，於服務鏈整合之發展趨勢下，服務品質之提升需仰賴合作夥伴之共同持續改善，且服務項目之提供亦應視顧客需求之不同而彈性調整，此研究結果能呼應原申請計畫欲結合供應鏈觀點以及市場區隔變數，探討服務品質改善策略之主要目標。

2. 研究成果在學術期刊發表或申請專利等情形：

論文：已發表未發表之文稿撰寫中無

專利：已獲得申請中無

技轉：已技轉洽談中無

說明：本計畫於計畫執行期間已完成兩篇學術研討會論文，其中，投稿至國際研討會之論文更獲得最佳論文獎。且本計畫預計於論文編修後，投稿至 I 級國際期刊。目前期刊論文已進入投稿階段，而已發表之研討會論文相關資訊陳列如下：

(1) Yang, C. L., Chan, Y. H. & Lin, S. P. (2011). *Effect of supply chain integration on customer loyalty: an examination of Taiwan's mobile telecommunication service*. e-Case & e-Tech 2011, Tokyo, Japan. [Best Paper Award]

(2) 楊振隆、詹雅慧(2010)。行動通信服務鏈品質對顧客忠誠度之影響性探討：以關係品質為中介變數。2010華人經濟圈企業競爭力與經營管理學術研討會，新竹：中華大學。

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值(簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性)(以 500 字為限)

說明：藉由本計畫之完成，可達到之主要學術以及管理貢獻包括下列四點：

- (1) 本計畫透過單一產業之深入剖析，確切地了解服務產業之服務鏈整合策略，以及其對於服務設計以及服務品質確保之影響。換言之，本研究所探討之主題，係以行動通訊服務產業之實務運作為主體，因此可強化研究結果之實務管理效度以及貢獻。
- (2) 本計畫將供應鏈觀點導入服務產業中，發展服務鏈整合品質評估量表，並建立整合性服務品質之轉換函數，此概念為過去相關研究未曾涉入之議題，因此透過本計畫之執行，不僅可為相關研究於進行整合性品質績效之判別上，提供更進階之決策法則，亦有助於服務業者釐清服務鏈整合策略對於策略目標間之一致性。
- (3) 為了提供更具體且更符合實務管理之決策建議，本計畫進一步針對不同服務鏈形態下之整合性品質進行探討，並藉此釐清不同服務鏈整合決策對於顧客忠誠度之影響，此做法可提供做為未來相關研究於應用或延伸時之參考依據。
- (4) 參與本計畫之研究生於計畫執行過程中，不僅學習到量化研究之相關研究歷程，並學會如何應用多變量統計方法於服務業之供應鏈管理與顧客關係管理之研究領域上。因此，本計畫之完成亦有助於學生在學術領域以及軟體實務操作兩方面之成長。

Effect of Service Chain Integration on Customer Loyalty: An Examination of Taiwan's Mobile Telecommunication Service

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ABSTRACT

With the constantly changing technologies and consumer demand, the telecommunication companies must cooperate with up and down stream supply chain parties to create values for their consumers and stay competitive. The extant literature has not fully examined the issues of how such supply chain integration contributes to the overall quality and customer loyalty in the mobile telecommunication industry. This study proposes a service chain quality-loyalty model to investigate factors that are critical to customer loyalty in the mobile telecommunication industry. First, a scale of overall telecommunication quality is developed with the consideration of three quality dimensions: phone, service, and value-added. Subsequently, using a structural equation modeling (SEM) analysis, we examine the mediated effect of relationship quality and switching cost on the relationship between overall telecommunication quality and customer loyalty. Once validated, the proposed model should serve as a valuable tool for managers to assess and improve their current supply chain operations to achieve customer loyalty in the mobile telecommunication industry.

Keywords: Service Chain, Relationship Quality, Switching Cost, Customer Loyalty, Mediated Effect, Mobile Telecommunication Industry

1. Introduction

Since Taiwan opened its telecommunication industry to private operators in 1997, the market has changed from being in the control of state-owned operators to becoming a fairly competitive environment. The robust development of mobile telecommunication (hereinafter referred to as M-Telecom) has ushered in a cutthroat competition in the market. According to statistics from the National Communication Commission, M-Telecom accounted for 59.2% of the total revenue of the telecommunication service by the end of 2008. However, when the General Administration of Telecommunications of the Ministry of Transportation and

Communication introduced mobile number portability, it reduced greatly the threshold for consumers to switch among service providers and resulted in high mobility of customers. To consolidate their market share, M-Telecom operators need to create diversified value-added service by combining telecommunication technologies with the service industry, such as mobile transaction and mobile-commerce, among others, to boost average revenue per user aside from actively improving internal service quality to meet customer demand. In short, in such a competitive market like M-Telecom, the ability to provide a high degree of customer loyalty services through service chain integration (SCI) is crucial to providers in setting themselves apart from their competitors.

Researchers have long articulated the need for a close, integrated relationship between manufacturers and their supply chain partners to be sustainable in the market. For example, by comparing the main and interaction effects of SCI and diversification on performance, Narasimhan and Kim (2002) pointed out that the SCI strategy modifies the relationship between diversification and performance. Moreover, the coordinated use of SCI and diversification strategies has a significant effect on firm performance. From the resource-based viewpoint, Kim (2009) revealed that SCI synchronizes the core competencies and capabilities of all supply chain participants to achieve improved service capabilities at a lower total supply chain cost. This demonstrates that the close interrelationship between the level of supply chain practices and competition capability may have a more significant effect on the organization's competitiveness. Moreover, Flynn, Huo, and Zhao (2010) indicated that a close relationship between supply chain partners and the manufacturer offers opportunities for improving the accuracy of demand information, allowing the manufacturer to be more responsive to customer needs. However, the development and empirical validation of the effect of SCI on service performance in an M-Telecom context have not been studied.

As for the service industry, the focal point of the many firms' marketing activities is customer loyalty to their products or services (Vesel & Zabkar, 2009). Lin and Wang (2006) focused on the mobile commerce market and further indicated that retaining customers is a financial imperative for any vendor because attracting new customers is considerably more expensive than traditional, brick-and-mortar stores. Therefore, this study uses customer loyalty as a critical index to evaluate service performance and to develop a model on the relationship between service chain integration and customer loyalty. The attempt of several studies to understand the service quality–customer loyalty relationship through service-profit chain in M-Telecom services is taken as the basis of our SCI quality–customer loyalty model (e.g., Deng, Lu, Wei, & Zhang, 2010; Liu, Guo, & Lee, 2010; Deng, Lu, Wei, & Zhang, 2010). However, a comprehensive set of studies emphasizes that this relationship is mediated by some factors that are important for the success of mobile services firms. From the relationship marketing

perspective, the present study focuses on the relationship quality due to its important avenue for better understanding and predicting customer loyalty programs (Fullerton, 2005; Gundlach, Achrol, & Mentzer, 1995). Luarn and Lin (2003) indicated that building strong relationships with customers, that is, developing the loyalty of consumers, is considered a key factor in winning the market share and developing a sustainable competitive advantage (Nasir, 2005). Both theoretical and empirical studies have shown that switching costs are also one of the most important economic forces affecting market competition in mobile communications. For example, Maicas, Polo, and Sese (2009) suggested that switching costs could arise when mobile providers lock handsets to be used exclusively within their own networks, which demonstrates that switching costs reduce market competition, leading to higher prices, lower product and service quality, and lower customer welfare. Deng, Lu, Wei, and Zhang (2010) also concluded that when customer uses a mobile instant message service provided by one particular service provider and perceive the switching cost for changing to a new service provider is high, they will have higher customer loyalty due to the trouble in building a new contact relationship. Accordingly, the purpose of this research is to propose an SCI quality–customer loyalty model in the M-Telecom context by examining the mediated effects of relationship quality and switching cost on such relationship. Thus, the literature regarding service quality and customer loyalty is reviewed, followed by a discussion of the mediated effect of relationship quality and switching cost. Several related hypotheses are then proposed. In next section, a newly proposed SCI quality function is presented in response to Vaart and van Donk (2004), who argued that supply chain integration practices in different types of industry might be understood in different ways (Frohlich & Westbrook, 2001). Finally, the results as well as implications for researchers are discussed.

2. Conceptual Background

2.1 Service quality – loyalty relationship

Customer loyalty refers to the customer's willingness or behavior of repeated purchase driven by market activities (Henning-Thurau, Gwinner, & Gremler, 2002). Griffin (1996) perceived that loyal customers offer a steady stream of revenue for a company by remaining with the brand/supplier and rejecting the overtures of competitors. Doney and Cannon (1997) indicated that loyal customers are more likely to concentrate on long-term benefits from the relationship (Gustafsson & Johnson, 2004) and are more willing to work with the suppliers to develop mutual benefits than non-loyal customers are (Martin, Ponder, & Lueg, 2009). Therefore, many academics and practitioners have pointed out the importance and benefits of attracting and

maintaining loyal customers because profitability follows customer loyalty (Adjei & Clark, 2010; Rauyruen & Miller, 2007). Hence, maintaining or even increasing customer loyalty is one of the primary goals of relationship marketing.

Here we will discuss the effect of SCI quality on customer loyalty or retention. This is in accordance with what the service quality perspective proposes; that is, service quality evaluations substantially drive customer loyalty in service industries. Building on prior research, Rauyruen and Miller (2007) provided a picture of how trust, commitment, satisfaction, and service quality influence customer loyalty in the business-to-business context. Using the courier delivery service context in Australia, the results of structural equation modeling show that all four constructs influence attitudinal loyalty, whereas only satisfaction and perceived service quality influence behavioral loyalty. Deng, Lu, We, and Zhang (2010) examined the determinants of customer satisfaction and loyalty. Their findings confirm that trust, perceived service quality, and perceived customer value contribute to generating customer loyalty in mobile instant message (MIM) services. Therefore, MIM service marketing strategies may become more fruitful by focusing on these psychological processes. Accordingly, the following hypothesis serves to test this claim:

H1: *A customer's perceived SCI quality positively influences his/her loyalty in mobile telecom service context.*

The “service-profit chain (SPC)” proposed by Heskett et al. (1994) is a comprehensive framework that links together various aspects of a company's operation, such as internal service quality, employee's satisfaction and loyalty, external service quality, customer's satisfaction and loyalty, and organization performance. In other words, the SCP presents a continuous set of stages starting from the operational strategy, employee capabilities and delivery system through customer's perception of service quality and its effect on financial performance (Jones, 1997). Recently, the notion has triggered some researchers to study the impact of the mediated role of satisfaction on service quality—customer loyalty relationship. For example, the empirical study of Yee, Yeung, and Cheng (2005) showed that service quality is positively related to customer loyalty through customer satisfaction in high-contact service shops in Hong Kong. Yee, Yeung, and Cheng (2010) observed that service quality is significantly related to customer satisfaction, which in turn impacts customer loyalty, ultimately leading to firm profitability in high-contact service industries. Accordingly, we suggest the following hypotheses:

H2: *A customer's perceived SCI quality positively influences his/her overall satisfaction in mobile telecom service context.*

H3: A customer's perceived overall satisfaction positively influences his/her loyalty in mobile telecom service context.

2.2 The mediated effect of relationship quality

The concept of relationship quality first proposed by Dwyer et al. (1987) in the research of relationship marketing focuses on discussing how to strengthen further already strong relationships and to convert indifferent customers to loyal ones. Marketing literature points out that relationship quality is considered a consistent theme because the development and maintenance of collaborative relationships between firms have increased in recent years (Alejandro et al., 2010). Although the operationalization of relationship quality is not consistent, the present study conceptualizes relationship quality as a multifaceted construct that includes trust and commitment because these two elements are the most examined aspects in prior studies (Alejandro et al., 2010; Dick & Basu, 1994; Dwyer et al., 1987; Liu et al., 2010).

According to past research, relationship quality is an important avenue to understand and predict customer loyalty programs better. Fullerton (2005) indicated that affective commitment and continuance commitment are mainly partial mediators of the service quality–loyalty relationship. This is in accordance with what the relationship marketing perspective proposes, that is, customer commitment to the service provider substantially drives customer loyalty in services industries. In addition, affective commitment to the retailer has a positive effect on customer loyalty, whereas continuance commitment in marketing relationship has a deleterious effect on customer loyalty. Liu, Guo, and Lee (2010) found that good relationship quality makes customers want to stay with the current service provider, whereas switching barriers make customers feel that they have to stay. Moreover, the indirect influence of service quality on customer loyalty exists only when coupled with satisfaction and trust. Based on the literature stated above, the following hypotheses are made:

H4: A customer's perceived SCI quality positively influences his/her perceived relationship quality in mobile telecom service context.

H5: A customer's perceived relationship quality positively influences his/her loyalty in mobile telecom service context.

2.3 The mediated effect of switching cost

Switching costs refer to the costs expressed as time, efforts, and financial risk associated with switching service providers (Dick & Basu, 1994). Clearly, switching costs are not only economic in nature but can also be psychological and emotional. Based on previous studies (e.g., Chen & Hitt, 2002), perceived switching costs in the current study are defined as consumer perceptions of the time, money, and effort associated with changing from one M-

Telecom service provider to another.

Switching cost is increasingly finding its way into models of customer loyalty because it pertains to the uncertainty of dealing with a new service provider. For example, by investigating the Korean M-Telecom services industry, Kim, Park, and Jeong (2004) indicated that mobile carriers must maximize customer satisfaction and the switching barrier to enhance customer loyalty. In particular, raising the switching barrier must build a long-term relationship with customers by further investing in customer relationship management. This is similar to the findings of Fullerton (2003), who pointed out that a marketing relationship built on high switching cost may help retain customers' loyalty to their relational partner because they feel bound to that relational partner. In other words, increasing a customer's perceptions of the risks of switching to other providers and reminding him/her of the trouble in building a new contact relationship and of the difficulty in using an alternative service will increase the likelihood that the customer will keep the relationship with the current service provider (Deng, Lu, Wei, & Zhang, 2010). Therefore, the following hypothesis is made:

***H6:** A customer's perceived satisfaction positively influences his/her perceived switching cost in mobile telecom service context.*

***H7:** A customer's perceived switching cost positively influences his/her loyalty in mobile telecom service context.*

3. Quality Function of Service Chain Integration

Frohlich and Westbrook (2001) perceived that there are still some questions to be answered with respect to the concept of integration, such as its difficulty to be measured empirically. Vaart and van Donk (2004) argued that supply chain practices in different types of industry show that integration might be understood in different ways or that a specific aspect should be stressed. In other words, different characteristics of a supply chain lead to different integrative practices and thus to different SCI measurement frameworks. At present, the service chain in the M-Telecom market of Taiwan is carried out in two modes (Figure 1). The first is to integrate with the upstream cell phone providers by providing customers with diversified and low-cost cell phone choices and customized cell phones for different target markets. The second is to emphasize on cooperating with downstream network service providers by providing value-added services, such as music, movie, learning, games, and news, to customers to reach the target of creating a mobile lifestyle. Hence, the assessment system of the integration performance of M-Telecom service should be built on cell phone quality, telecom providers' service quality, and customer's acceptance of IT application services.

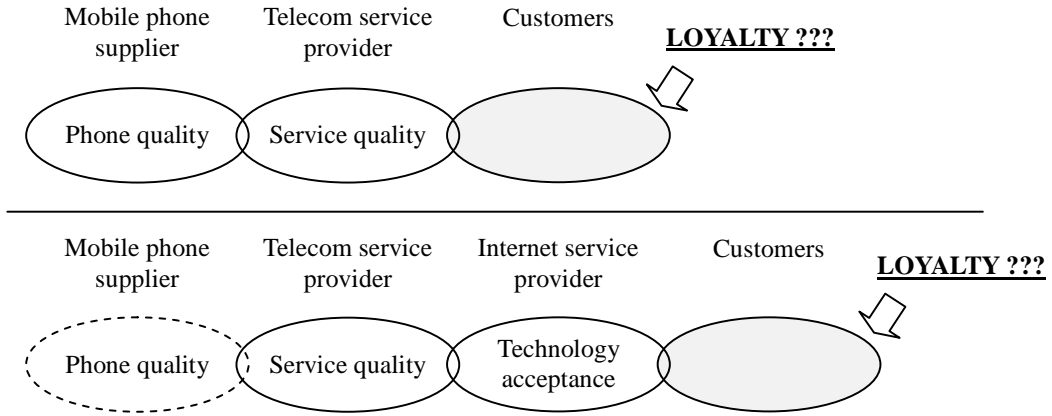


Figure 1. Mobile telecom service chain

This study shows that the removal of these shared resources is closely related to the recently introduced concept of customer focus. Therefore, adopting the value of customer perceptions in the integration practices of service providers to evaluate SCI performance is more appropriate. This study intends to use factor loading as the basis for assessing the integration performance of a service chain. Below are the details of the evaluation:

1. Evaluate the quality performance of individual elements constituting the service chain (i.e., cell phone service, telecommunication service, and value-added service). The evaluated performance of quality element (F_{pi}) is the product of satisfaction degree recognized by consumers and factor loading. Assume that i ($=1, 2, \dots, n$) represents the number of respondents, j ($=1, 2, \dots, k$) indicates the observed variables to which the evaluated quality element belongs, and p_{ij} is the satisfaction degree recognized by i^{th} respondent on j^{th} observed variable of quality. Hence, the performance of evaluated quality element can be obtained using the following formula:

$$F_{pi} = \lambda_1 \times p_{1i} + \lambda_2 \times p_{2i} + \lambda_3 \times p_{3i} + \dots + \lambda_k \times p_{ki} \quad (1)$$

2. Evaluate the integrated (quality) performance of the service chain (i.e., M-Telecom service chain and value-added mobile service chain). The evaluated quality performance of the service chain (SCI_t) is the product of the performance of quality elements obtained from the previous stage. Assume e ($=1, 2, \dots, t$) represents the quality performance of cell phone, telecom, and value-added services, respectively, evaluated from the previous stage. The integrated performance of the service chain can be obtained using the following formula:

$$SCI_t = F_{pi1} \times F_{pi2} \times \dots \times F_{pie} \quad (2)$$

4. Research Design

4.1 Samples and Data Collection

This study was conducted in Taiwan. A single university was selected to focus on the age group of 21–30 for sampling to increase the representative of the population. Respondents were asked to identify a pair of mobile phone supplier (brand) and M-Telecom service provider, and were then asked to indicate their actual perception of each item. Using a convenience sampling method, 159 questionnaires were completed, returned, and used for the final analysis.

4.2 Measurement: constructs of interest

Customer loyalty

Measuring loyalty has been problematic for many researchers because of the imprecise and varying definitions of this construct (Gronholdt, Martensen, & Kristensen, 2000; Jones & Sasser, 1995; Srinivasana, Andersona, & Ponnabolub, 2002). However, customer loyalty generally encompasses an affective component and a behavioral dimension (Eshghi, Haughton, & Topi, 2007). As for the definition suggested by Gustafsson and Johnson (2002), an affective loyalty represents a psychological reaction and conviction to a product or service experience, whereas behavioral loyalty is simply a manifestation of that affective state, which is sometimes equated with customer retention. In keeping with this definition, customer loyalty is defined here as both the attitudinal preference and behavioral intention for the service provider accompanied by a strong repeat purchase behavior as evaluated by five items.

Relationship quality

Although previous research on relationship quality have discussed and tested the concept of relationship quality in various research contexts, the definition and operationalization of relationship quality differ from one research project to another. Building on previous literature (e.g., Alejandro et al., 2010; Dick & Basu, 1994; Dwyer et al., 1987; Garbarino & Johnson, 1999; Liu et al., 2010), the present study conceptualizes relationship quality as a multifaceted construct that includes trust and commitment. Trust is defined as the consumer's willingness to rely on his/her expectations about a firm's future behavior and is evaluated by five items. Commitment is the customer's long-term orientation towards a business relationship, which is evaluated by three items.

Switching cost

Obstacles to switching include the economic, psychological, and emotional sacrifices that may be necessary before, during, and after service conversion. Considering the findings from earlier studies and the specificities pertaining to M-Telecom services, the present study follows that of Kim et al. (2004) to propose the following cost classifications: loss cost, adaptation cost, and move-in cost. Loss cost refers to the perception of loss in social status or performance when canceling a service contract with an existing carrier; adaptation cost refers to the time and effort spent in information acquisition, exchange, and evaluation of alternative services; and move-in cost refers to the economic cost involved in switching to a new carrier, such as the purchase of a new device and the subscriber fee. Seven items are proposed for measuring perceived switching cost of changing M-Telecom service providers.

Service chain integration quality

The integrated quality of the M-Telecom service chain defined in this study comes from the comprehensive appraisal of consumers on services provided by different members of the service chain (i.e., cell phone provider, upstream; telecom service provider, focal firm; value-added service, downstream). Hence, this study intends to develop an SCI scale with the connotation of product or service provided by members of the service chain. First, with regard to cell phone providers, this study develops indexes to assess phone quality from eight measures: performance, features, consistency, reliability, durability, after-sales service, appearance, and customer perception of quality with reference to the viewpoint of Garvin (1987). As to M-telecom providers, this study assesses service quality using nine items with reference to the study of Aydin and Ozer (2005). In light of the influence of IT application on the delivery of value-added services, this study uses the perceived ease-of-use and perceived usefulness proposed by Davis (1984) in the technology acceptance model for the application of technologies as the basis for development of assessment indexes.

4.3 Psychometric properties

For each latent construct, reliability and validity were assessed based on a three-step procedure with confirmation factor analysis (CFA). Analysis was performed using the LISREL software through the maximum likelihood method. In the first step, each latent construct was tested for internal consistency using Cronbach's alpha and construct reliability. Cronbach alpha coefficients were between 0.705 and 0.939, which are above the benchmark of 0.70 suggested by Nunnally (1978); the construct reliabilities were 0.812, 0.901, 0.782, 0.901, 0.883, 0.905, and 0.899 respectively, which are above the benchmark of 0.60 suggested by Bagozzi and Yi

(1988). Overall, the results suggest a high internal consistency of survey measures, and hence the reliability of each construct was ensured.

Table 1. Descriptive Statistics and Reliability/Validity Analysis

	no. items	Cronbach's α	Factor loading	Construct reliabilities
<i>Relationship quality</i>				0.812
Trust	5	0.920	0.88*	
Committee	3	0.875	0.77*	
<i>Satisfaction</i>				0.901
<i>Switching cost</i>				0.782
Loss cost	3	0.786	0.83*	
Adaptation cost	2	0.862	0.67*	
Move-in cost	2	0.705	0.71*	
<i>SCI quality</i>				
Phone quality	8	0.930	0.59*~0.84*	0.904
Service quality	11	0.877	0.42*~0.78*	0.883
Added service quality	6	0.939	0.57*~0.89*	0.905
<i>Customer loyalty</i>				0.899

Note: * means $p < 0.05$

Convergent validity and discriminant validity were then assessed. Convergent validity is supported if the standardized factor loadings of the observed items on latent constructs are above 0.50 (Bagozzi & Yi, 1988). In Table 1, the standardized factor loadings ranged from 0.42–0.95 and were statistically significant at $p < 0.05$. Therefore, convergent validity of the measurement indicators was supported. The discriminant validity test was performed to establish the distinction among the constructs used in this study. This study followed the method suggested by Hair et al. (2006) of pairing two latent constructs and subjecting them to two models of CFA (i.e., unconstrained model and constrained model). The results indicate that all the chi-square difference values were statistically significant at $p < 0.05$, implying that the discriminant validity was supported.

5. Statistical Results

This study applied structural equation modeling to examine the proposed model using LISREAL. Figure 2 shows the properties of the causal paths, including standardized path coefficients and t-values of the upstream SCI model. The overall fit of this structural model is acceptable: Chi-square = 310.90 ($df = 59$), RMSEA = 0.164, GFI = 0.77, CFI = 0.88, and NFI = 0.86. Results show that the effect of upstream SCI on relationship quality, satisfaction, and customer loyalty were non-significant. Thus, H1, H2, H4 were not supported. As expected,

perceived relationship quality had a positive and significant effect on customer loyalty ($\beta = 0.53, p < 0.05$), supporting H5. Switching cost was found to be a full mediator of satisfaction–customer loyalty relationship ($\beta = 0.72, 0.44, p < 0.05$), whereas the direct effect of satisfaction on customer loyalty was non-significant. Therefore, H6 and H7 were also supported but not H3. Altogether, relationship quality and switching cost were found to be the significant factors in determining customer loyalty.

Properties of the causal paths of downstream SCI are depicted in Figure 3. The overall fit of this structural model is not excellent but acceptable: Chi-square = 227.56 ($df = 58$), RMSEA = 0.186, GFI = 0.71, CFI = 0.86, and NFI = 0.84. Among the seven hypotheses, five hypothetical relationships were supported at a significance level of $p < 0.05$, while the direct effect of downstream SCI on loyalty will be significant at a level of $p < 0.1$. The estimate of the standardized path coefficient indicates that downstream SCI had a positive and significant effect on customer loyalty ($\beta = 0.18$), satisfaction ($\beta = 0.23$), and relationship quality ($\beta = 0.20$), supporting H1, H2, and H4. The relationship between relationship quality and customer loyalty (H5) was also highly significant ($\beta = 0.57$). The direct impact of perceived satisfaction on customer loyalty (H3) was non-significant, while this was mediated by switching cost with an indirect effect of 0.44 ($= 0.80 \times 0.55$).

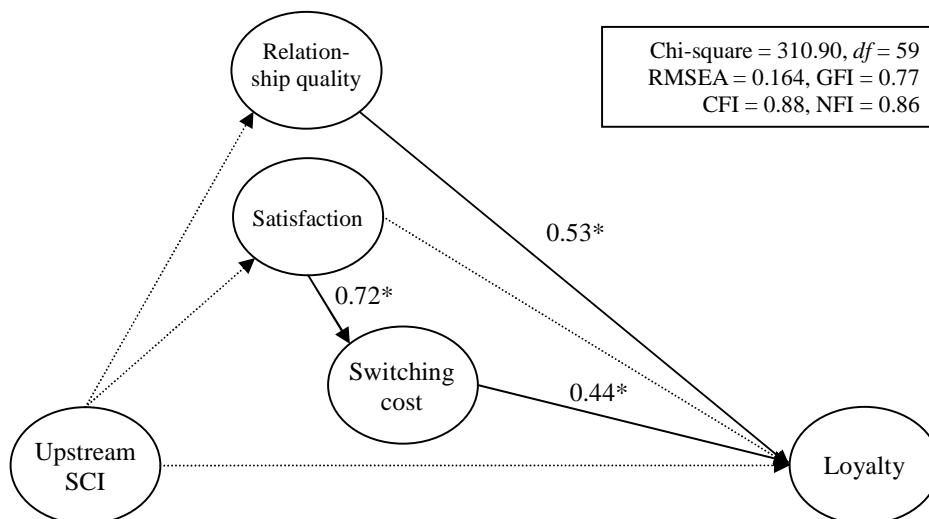


Figure 2. Structural equation modeling results of upstream integration

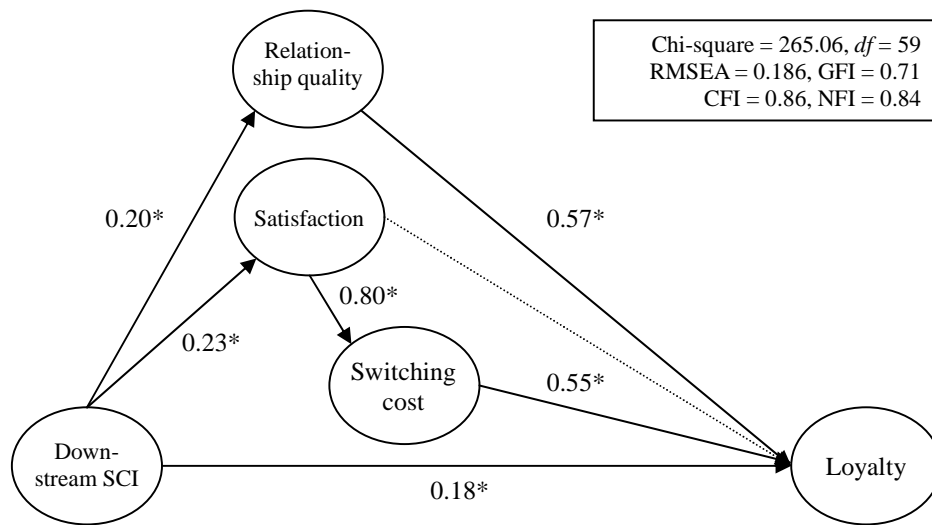


Figure 3. Structural equation modeling results of downstream integration

6. Conclusion

With fiercer competition across all industrial sectors, the integration of supply chain has been adopted as the main management strategy to obtain a competitive advantage. Previous studies have focused on the practice of integration of supply chain in the manufacturing industry. As such, the present study aims mainly to examine the influence of the service chain's integration with customer loyalty, a critical financial imperative for service vendor, with the possible mediated effects. Therefore, this study developed and tested the relationships among two SCI forms, customer satisfaction, relationship quality, switching cost, and customer loyalty in the context of M-Telecom services. The empirical examination of the factors that build customer loyalty in an M-Telecom context advances our understanding of these constructs and their linkage to customers' continuous transaction with their service provider. Results of both upstream (Figure 2) and downstream (Figure 3) models lend strong support for the direct effects of relationship quality and switching cost on customer loyalty, whereas relationship quality exhibits a stronger direct effect on customer loyalty than switching cost. Moreover, switching cost is found to be a full mediator of satisfaction and customer loyalty relationship. It conforms to the findings of previous studies, that is, maintaining close cooperative relationship with customers in the competitive market is requisite for a business to survive (Kim et al. 2004; Fullerton, 2003; Deng et al., 2010). This study thus suggests that business can increase switching cost to consolidate its long-term competitive advantage by increasing the diversity of customer choice through a transparent mode of transaction and providing services with a higher added value.

However, this study found that the upstream integration of M-Telecom operators has no significant influence on the relationship quality, satisfaction, and loyalty; in contrast, downstream integration has significant benefits. Customers think that diversified value-added service is more important than the choice provided by M-Telecom providers and cell phone choice. This may be attributed to the promotion of mobile number portability that enables customers to switch between M-Telecom operators freely without losing the original number and reduces greatly the cost of switching perceived by customers. Although M-Telecom operators can provide consumers with a low-cost choice of cell phones by cooperating with upstream, consumers may develop the opposite intention due to constraints in choosing a special mobile mode. As a whole, along with the popularization of 3G cell phones, the value-added service market apparently becomes the current target pursued by M-Telecom operators. This situation is also proven by this study: If M-Telecom operators cooperate with the downstream network service provider to simplify the procedure of using value-added service or strengthen benefits of M-Telecom value-added service on consumers, it will help to reinforce consumers' trust in and satisfaction on the M-Telecom operators and to establish effectively the switching cost for customers to stabilize the loyal behavior. This finding could also be proven from studies of past integration of supply chain. According to most studies, the downstream integration of the supply chain helps enterprises to come closer to the true demand of customers. Enterprises can respond rapidly to the dynamic demand of customers and move preemptively when they have the ability to cope with changes flexibly.

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e-CASE & e-Tech 2011--- Acceptance Notification and Invitation Letter (5058)

2010/11/11(四) 下午8:01

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Acceptance Notification and Invitation Letter

2011 International Conference on e-Commerce, e-Administration, e-Society, e-Education, and e-Technology (e-CASE & e-Tech 2011)

Toshi Center Hotel, Tokyo, Japan

January 18-20, 2011

Paper Number: 5058

Paper Title: Effect of Supply Chain Integration on Customer Loyalty: An Examination of Taiwan's Mobile Telecommunication Service

Author: Chen-Lung Yang, Ya-Hui Chan, Shu-Ping Lin

Dear Ya-Hui Chan,

It is our pleasure to inform you that your paper has passed the review process and been accepted by the e-CASE & e-Tech 2011. The Program Committee would like to invite you to attend the e-CASE & e-Tech 2011 in Tokyo.

We kindly ask you to prepare and upload your final version of paper together with your registration before the deadline of November 10, 2010. For a paper or abstract to be included in the conference proceedings, at least one author must register and pay the registration fees before the deadline. You can find all information at the conference website.

<http://www.e-case.org/2011>

If you have any questions, please do not hesitate to contact Conference Coordinator

Dr. Chien-Kuo Li at ecase2011@gmail.com

Once again, thank you very much for your contribution. We hope to welcome you at the Toshi Center Hotel in January, 2011.

Yours sincerely,

Chien-Kuo Li, Ph.D.

Coordinator of e-CASE & e-Tech 2011

國科會補助專題研究計畫項下出席國際學術會議心得報告

日期：100年1月20日

計畫編號	NSC 99-2410-H-216-003		
計畫名稱	結合供應鏈觀點與消費者市場區隔變數探討行動通信服務品質之改善策略		
出國人員姓名	楊振隆	服務機構及職稱	中華大學科技管理學系 副教授
會議時間	100年1月17日 至 100年1月21日	會議地點	日本-東京(Tokyo, Japan)
會議名稱	(中文) (英文) e-Case & e-Tech 2011		
發表論文題目	(中文) (英文) Effect of supply chain integration on customer loyalty: an examination of Taiwan's mobile telecommunication service		

一、參加會議經過

本人於1月17日帶博士班學生詹雅慧及連素鴛抵達日本成田機場，並於當天住宿於東京王子飯店，並於隔日(1月18日)前往會議現場參加此次學術研討會。此次會議時間為1月18日至1月20日，由於本次投稿內容偏屬於對科技化服務供應鏈管理之議題，因此被安排於e化科技之場次進行發表，發表場次為1月21日10:20~12:00的時段。本場次共有5篇文章進行發表，且本場次參與之學者約有15人。論文發表完畢後，多位學者針對發表之論文提出建議並進行討論。會議完畢後，本人與學生於1月21日晚間搭機返台。

二、與會心得

本次國際學術研討會之性質包含電子化相關之議題(如：e-education、e-administration、e-technology...)，相當符合本人所就任之科系。而會議中所發表之許多論文均可作為未來研究之參考。於本次會議中，本人認識來自於馬來西亞、泰國、香港及台灣等各個國家之學者，其不僅針對本次發表之論文給予肯定，亦針對本校帶博士出席

國係研討會之制度表達肯定，因此獲得推廣校譽之機會。另外，本人帶博士生共同參與此次學術研討會，因此不僅可訓練學生學習英文論文撰寫之能力，亦可讓學生熟悉全程英文會話以及應答之環境，此做法實有助於增加學生之國際觀，因此相信此次參與國際研討會的經驗，對博士生在未來的學術研究上有很大助益。

四、建議

無。

五、攜回資料名稱及內容

國際學術研討會之論文光碟、研討會註冊收據、研討會議程手冊。

六、其他

為證明本人及學生出席本次國際學術研討會，僅附上相關照片以茲佐證。



出席者：楊振隆



學生：連素駕(左)、詹雅慧

出席者：楊振隆

國科會補助計畫衍生研發成果推廣資料表

日期:2011/10/24

國科會補助計畫	計畫名稱: 結合供應鏈觀點與消費者市場區隔變數探討行動通信服務品質之改善策略
	計畫主持人: 楊振隆
	計畫編號: 99-2410-H-216-003- 學門領域: 資訊管理
無研發成果推廣資料	

99 年度專題研究計畫研究成果彙整表

計畫主持人：楊振隆		計畫編號：99-2410-H-216-003-					
計畫名稱：結合供應鏈觀點與消費者市場區隔變數探討行動通信服務品質之改善策略							
成果項目		量化			單位	備註（質化說明：如數個計畫共同成果、成果列為該期刊之封面故事...等）	
		實際已達成數（被接受或已發表）	預期總達成數（含實際已達成數）	本計畫實際貢獻百分比			
國內	論文著作	期刊論文	0	0	100%	篇	
		研究報告/技術報告	0	0	100%		
		研討會論文	1	1	100%		
		專書	0	0	100%		
	專利	申請中件數	0	0	100%	件	
		已獲得件數	0	0	100%		
	技術移轉	件數	0	0	100%	件	
		權利金	0	0	100%	千元	
	參與計畫人力（本國籍）	碩士生	1	1	100%	人次	
		博士生	0	0	100%		
博士後研究員		0	0	100%			
專任助理		0	0	100%			
國外	論文著作	期刊論文	0	0	100%	篇	
		研究報告/技術報告	0	0	100%		
		研討會論文	1	1	100%		
		專書	0	0	100%		章/本
	專利	申請中件數	0	0	100%	件	
		已獲得件數	0	0	100%		
	技術移轉	件數	0	0	100%	件	
		權利金	0	0	100%	千元	
	參與計畫人力（外國籍）	碩士生	0	0	100%	人次	
		博士生	0	0	100%		
博士後研究員		0	0	100%			
專任助理		0	0	100%			

<p>其他成果 (無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。)</p>	<p>無</p>
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	成果項目	量化	名稱或內容性質簡述
科 教 處 計 畫 加 填 項 目	測驗工具(含質性與量性)	0	
	課程/模組	0	
	電腦及網路系統或工具	0	
	教材	0	
	舉辦之活動/競賽	0	
	研討會/工作坊	0	
	電子報、網站	0	
	計畫成果推廣之參與(閱聽)人數	0	

國科會補助專題研究計畫成果報告自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估

達成目標

未達成目標（請說明，以 100 字為限）

實驗失敗

因故實驗中斷

其他原因

說明：

2. 研究成果在學術期刊發表或申請專利等情形：

論文： 已發表 未發表之文稿 撰寫中 無

專利： 已獲得 申請中 無

技轉： 已技轉 洽談中 無

其他：（以 100 字為限）

本計畫於計畫執行期間已完成兩篇學術研討會論文，其中，投稿至國際研討會之論文更獲得最佳論文獎。此外，本計畫預計於論文編修後，投稿至 I 級國際期刊，目前期刊論文已進入投稿階段。

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）（以 500 字為限）

有鑑於近年來行動通訊服務業之急劇成長，以及供應鏈整合概念對於持續性管理之重要性，本計畫之主要目的在於透過供應鏈觀點，建立行動通訊「服務鏈整合品質」與顧客忠誠度之關係模式。再者，為了有效衡量「服務鏈整合品質」，本計畫除發展行動通訊服務鏈品質量表外，更進一步建立服務鏈整合品質之轉換函數。另一方面，

有鑑於現階段行動通訊服務業為因應不同區隔市場之消費者需求所發展之供應鏈整合型態，本計畫更進一步針對不同服務鏈型態下之整合品質進行探討，期望藉此釐清服務鏈整合之實施效益，以做為未來協助行動通訊服務業者提升顧客忠誠度之參考依據。而研究結果顯示，行動通訊服務業者所採用之兩種供應鏈整合策略對於關係品質、轉換成本以及顧客忠誠度之建立，均具有不同之影響效果。因此，本計畫建議服務業者於擬定服務鏈整合策略時，必需先行確認其可能伴隨之實質效益與策略目標間之一致性。簡言之，於服務鏈整合之發展趨勢下，服務品質之提升需仰賴合作夥伴之共同持續改善，且服務項目之提供亦應視顧客需求之不同而彈性調整，此研究結果能呼應原申請計畫欲結合供應鏈觀點以及市場區隔變數，探討服務品質改善策略之主要目標。綜合上述，藉由本計畫之完成，可達到之主要學術以及管理貢獻包括下列四點：

一、透過單一產業之深入剖析，可確切地了解服務產業之服務鏈整合策略，以及對於服務提供以及服務品質確保之影響。換言之，本研究所探討之主題，係以行動通訊服務產業之

實務運作為主體，因此可強化研究結果之實務管理效度以及貢獻。

二、本計畫將供應鏈觀點導入服務產業中，發展服務鏈整合品質評估量表，並建立整合性服務品質之轉換函數，此概念為過去相關研究未曾涉入之議題，因此透過本計畫之執行，可以為相關研究於進行整合性品質績效之判別上，提供更進階之決策法則。

三、為了提供更具體且更符合實務管理之決策建議，本計畫進一步針對不同服務鏈形態下之整合性品質進行探討，並藉此釐清不同服務鏈整合決策對於顧客忠誠度之影響，此做法可提供做為未來相關研究於應用或延伸時之參考依據。

四、參與本計畫之學生在本計畫之執行過程中，不僅學習到量化研究之相關研究歷程，如文獻評析、抽樣設計、問卷設計、資料蒐集等，並學會如何應用多變量統計方法於服務業之供應鏈管理與顧客關係管理之研究領域上，亦學會利用 LISREAL 軟體進行關係模式之多群體結構方程模式分析。因此，本計畫之完成亦有助於學生在學術領域以及軟體實務操作兩方面之成長。