行政院國家科學委員會專題研究計畫 成果報告

整合設計鏈與顧客鏈建構高創新力供應鏈之研究（II）
研究成果報告(精簡版)

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報 告 附 件 ：出席國際會議研究心得報告及發表論文

公 開 資 訊 ：本計畫可公開查詢

中 華 民 國 101 年 08 月 28 日

中文摘要： 處於今日全球化高度競爭的市場環境下，廠商透過供應鏈管理整合上下游作業以建立全球競爭能力，已成為一種普世觀點；但隨著大多數製造商均可透過供應鏈具備同等競爭能力時，「產品創新能力」衍然成為勝出的新關鍵。然而，實務界發現僅透過傳統供應鏈中製造商與供應商的協同作業模式，對提升產品創新能力的幫助有限；相關研究文獻亦未證實「協同」與「產品創新」兩者之間有強烈的關連性。究其原因，在於傳統供應鏈偏重於生產作業層面的協同管理，較少論及產品創新層面的協同管理議題；除此之外，產品創新亦有賴於顧客資訊的持續回饋，但傳統供應鏈管理並未建立與顧客端的直接接觸管道。近年來實務界與相關學者建議，於供應鏈中導入設計鏈與顧客鏈應可解決上述的問題，但迄今真正成功執行的案例廠商仍不多見。另一方面，實務界也擔心導入設計鏈與顧客鏈之供應鏈運作模式，或可提升產品創新績效，但對成本、品質、交期、彈性等績效是否會產生負面影響。

基於上述，本研究計畫將透過實證研究深入探討：(1).影響設計鏈與顧客鏈有效執行之關鍵作業；(2).導入設計鏈與顧客鏈之供應鏈運作模式對產品創新、成本、品質、交期及彈性等績效之影響。其中「影響顧客鏈有效執行之關鍵作業」則為本年度計畫探討的主軸。

中文關鍵詞： 顧客鏈，資料倉儲系統，彈性服務流程，產品創新能力，國際製造策略調查

英文摘要： The concept of supply chain management (SCM) that integrating upstream and downstream has been well accepted in the industries to improve the competitiveness of products in today’s highly volatile global market. However, product innovative capability becomes critical once most of the competitors sit on equal SCM basis. It was found in the industries that traditional collaboration between manufacturer and supplier had limited help to the innovation of product and no strong connection between the ’collaboration’ and ’product innovation’ had been confirmed in relative studies. The short of product innovation in traditional supply chain may be explained by over-emphasis on manufacturing operation in the past and no direct link with customer to get continuous feedback

regarding product. Although design chain as well as customer chain has been suggested in recent years by practitioners and scholars to be integrated into traditional supply chain so that problem of product innovation could be improved, very few successful cases are reported yet. Industries concern also the negative impact of new integrated supply chain model upon the performances of cost, quality, delivery and flexibility in spite of the improvement of product innovation.
This proposal will use empirical study to find thoroughly regarding 1) key factors that may influence the effectiveness of design chain and customer chain to be integrated into traditional supply chain and 2) impact of the new integrated model upon the performances of product innovation, cost, quality, delivery and flexibility. ’The Customer Chain Effectiveness’ is the primary focus of this report.

英文關鍵詞： customer chain, data warehousing system, flexible service workflow, product innovativeness, International Manufacturing Strategy Survey

1. INTRODUCTION

In globalization decades, how to build an absolute competitive edge in competing markets around the globe has always been an issue that constantly concerns manufacturers. In fact, customers will choose the one who can produce the highest quality product at the lowest cost. Besides, if any manufacturer can further offer the shortest delivery time and have the high-flexibility response ability, then he will be the first choice for customers. As a result, if manufacturers desire to gain a competitive edge, they should make quality, cost, delivery time, and flexibility (QCDF) their performance goals [1]-[3].

How should an organization be able to have the ability to achieve the four performance goals? According to relevant scholars and practitioners, if manufacturers can establish a supply chain management (SCM) in a global operation environment, it will enable them to achieve the ability. Introduction of a SCM can shorten lead time of manufacturing operations, effectively control product cost and quality, and enable the organization to have the high-flexibility response ability in order to respond to a highly volatile market [4]-[7]. Moreover, cases of SCMs constructed by Wal-Mart, Dell, etc. also verify a positive effect of SCM.

Nevertheless, as most of the competitors can sit on equal SCM basis in recent years, manufacturers merely having the aforementioned abilities are not adequate to be viewed as having a global competitiveness. It is suggested that manufacturers must further have a product innovation capability (PIC) in order to really secure their own global competitive edge, i.e. if customer needs can be known and physical products can be produced rapidly, then they will retain customers and maintain high competitiveness. Therefore, in addition to QCDF, how to equip an organization's internal operations with PIC has become a critical issue that concerns manufacturers commonly [8], [9].

Relevant researches that addressing SCM and product innovation issues argued that "collaboration" between manufacturers and suppliers is key to facilitating product innovation performance. For instance, Kim [10], Ulusoy [11], Nieto and Santamaria [12] et al. indicated that introducing collaborative design between manufacturer and supplier can indeed equip supply chain (SC) operation results with PIC. However, the above conclusion is questioned by the industry practitioners. This is because the traditional SCM model underlines an upgrading ability in QCDF, though weak in product innovation. Besides, in recent years in some often illustrated successful cases, no strong relevance is found between successful operation of SCM and product innovation.

In order to arm SC with a high PIC, a set of management model which can upgrade PIC is suggested to be developed from the original SC operating environment. As such, Design Chain (DC) and Customer Chain (CC) viewpoints gradually emerge. DC is a concept which has evolved from collaborative design. It emphasizes closely integration with suppliers for setting up a product design/development process [13]. A number of empirical studies [14]-[16] showed that introducing a DC management model can indeed facilitate effective execution of collaboration between manufacturer and supplier, thereby achieving PIC and avoiding negative problems derived from coordination operations.

Nevertheless, Twigg [13] pointed out that, in addition to DC management model between manufacturer and supplier, consideration should also be given to build contact channels with customers. Chuang and O'Grady [17] further indicated that a complete DC framework should take into account building up a customer management model for effectively obtaining customer's needs. In fact, whether new products can completely pleasure customers pivots on mastering of customer's needs. As a result, as far as DC is concerned, it is important to construct contact channels with customers also. Ishii [18] proposed that, if DC can combine with CC, it will be able to effectively gather customer's needs information and benefit product development. CC is designed to closely integrate with customers through effective management model for obtaining customer's feedback. There are a couple of studies addressing how to effectively construct a CC framework, for example, the Supply Chain Council (SCC) formulated CCOR (Customer Chain Operations Reference Model) [19] and Donaldson et al. [20] proposed a Customer Value Chain Analysis model.

Though some studies have proposed CC construction models, other research such as Robert & Veryzer [21] in discussing factors that affect product development pointed out that, customers' understanding of a product was limited and that therefore they could hardly describe their needs for a new product clearly. Ishii [18] also indicated that, even if CC could form an effective tool for effectively management customers, when customers' feedback became less, it was more unfavorable for product innovation. In order to address this problem, when CC is introduced and constructed, what extraordinary work should it go through to increase customer information feedback results? Past research rarely touched on this subject.

Based on the above discussion, the objective of this empirical study is to identify the key factors that will affect the successful execution of CC. This study is based on the samples from the International Manufacturing Strategy Survey (IMSS) database, a global research network initiated by London Business School.

2. LITERATURE AND HYPOTHESIS

An observation showed that, before introducing CC, customers' information feedback will be increased through two key operations to facilitate effective execution of CC: establishment of a data warehousing system (DWS) and establishment of a flexible service workflow (FSWf). Kärkkäinen and Elfvengren [22] argued that mastering customer's needs was crucial for elevating firm's PIC. In order to efficiently master information of customer's needs, customer's feedback is essential. Previous research believed that, through e-Commerce interactive platform, it was possible to really grasp information on customer's needs and urged customer to feedback. However, experiences of the industry practitioners showed that customers usually will not interact on an e-Commerce platform. For this reason, how to dig out information from customer's underlying behaviors had become the key to grasp customer's needs. To that end, an observation showed that construction of a DWS would be more effective for gathering information of customer's needs than e-Commerce. A DWS is similar to a multi-dimensional data cube concept. A useful data could be formed through analyzing and summarizing in different dimensions, which could exactly reflect customer's underlying needs and provide a reference for designers in product innovation. Therefore, for those successful cases, during the process of CC construction, with the rear end of each activity with customer contact, most manufacturers would design and link to their DWS operations. When customer purchases, needs repairs, customer service, etc., these data were stored and compiled through the DWS to dig out customer's underlying needs. Establishment of a DWS was able to overcome the defects of mere relying on what customer's said. Su et al. [23] and Liao et al. [24] showed that construction of a DWS will be of help effectively gathering and classifying of customer's underlying needs, which will benefit product development.

In addition, establishment of an FSWf also played a key role in facilitating customer's data feedback. A DWS can help to effectively gather information about customers' responses. But it is necessary to classify the information according to product line, avoid gathering ineffective or non-referential data. In constructing a CC framework, if the service workflow for contact with customers can change flexibly according to different order characteristics, it will be able to effectively gather information about customers' response to different products. And then, through DWS provides useful information to DC for developing a product that can more meet customers' needs. Wetzel & Klischewski [25] and Hu & Grefen[26] both indicated that a FSWf could effectively manage customers' information and positively affect the internal operations of manufacturing firms.

According to above discussion, the construct model was built as Fig. 1 and the following hypotheses were tested in this study:

H1: DWS positively affects CC effectiveness

H2: FSWf positively affects CC effectiveness

H3: CC effectiveness positively affects PIC

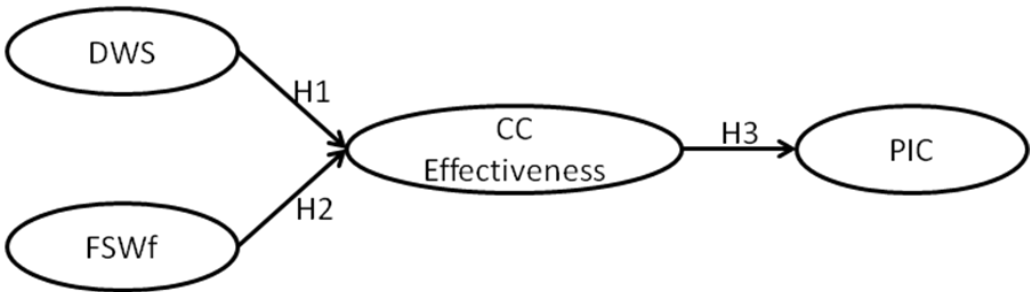

Figure 1: construct model

3. RESEARCH DESIGN

3.1 Survey Database and Test Samples

This study is based on the database of IMSS. The IMSS is an international cooperative research network focusing on manufacturing strategy and SCM. It gathers data about practice and performance related to manufacturing strategy in a global setting, and data pertaining to practice in

SCM are also collected. The survey employed questionnaire of five-point Likert scale as the means of measurement.

The survey of fifth iteration (IMSS-Ⅴ) was performed in 2009 and the data were published in 2010. It was involved by researchers worldwide including Europe (13 countries), the Americas (USA, Canada, Brazil and Mexico), and some of Asia countries (Taiwan, China, Japan and Korea). IMSS-V focuses upon the manufacturing firms related to fabricated metal products; machinery and equipment; office, accounting and computing machinery; electrical machinery and apparatus; radio, television and communication equipment and apparatus; medical, precision and optical instruments, watches and clocks; motor vehicles, trailers and semi-trailers ; other transport equipment. Total 725 respondents from 21 countries were recorded in the final releasing. These data were used for this study.

Firstly, the samples were classified by citing the method of Frohlich and Westbrook [27]. As a result, only 245 samples were able to fit the research purpose. And then, 16 samples were eliminated for whose responses were not complete or with missing values for variables of DWS, FSWf, CC effectiveness, and PIC. Therefore, only 229 of the 725 respondents are remained, i.e. the sample size of this study is 229.

3.2 Operationalization Variables and Independent Construct Measurement

In terms of research purpose, this study involved the testing of four variables: DWS, FSWf, CC effectiveness, and PIC.

Definition of DWS in this study focused on the activities of applying electronic tools to record and analyze customers' needs for improving product design and innovation. IMSS-V provided five kinds of DWS-related activities including: (1) scouting/pre-quality, (2) RFx(request for quotation, proposal, information), (3) data analysis, (4) order management and tracking, and (5) contract and document management. For these five kinds of DWS activities, this study firstly used mean value, standard deviation, and Skewness and Kurtosis to check whether the data are normally distributed. Test result indicated that data distribution has shown normally (please refer to Appendix A for details). To ensure that these test variables meet the research's requirements, then a construct validity test for DWS by factor analysis was performed. The test results indicated that the Kaiser-Meyer-Olkin (KMO) measure of performance adequacy was 0.79, Bartlett's test of sphericity was significant, Factor loading for all five items exceeded 0.62, and the results of Cronbach's α in factor exceeded 0.78.

Definition of FSMf in this study focused on the activities of shifting manufacturing towards services. IMSS-V included five measurement items regarding to establishment of FSWf: (1) power-by-the-hour (total responsibility for the product), (2) product upgrade (software, product modification), (3) help desk/customer support centre, (4) engaging in expanding the service offering, and (5) developing the skills to improve the service offering. Following the same processes, mean value, standard deviation, and Skewness and Kurtosis were used to verify data normality; significant results were achieved for these five items. And then, a factor analysis was done to check construct validity of FSWf. The test results showed that the Kaiser-Meyer-Olkin (KMO) measure of performance adequacy was 0.785, Bartlett's test of sphericity was significant, Factor loading for all five items exceeded 0.71, and the results of Cronbach's α in factor exceeded 0.82.

According to IMSS-V, there are three measurement items of SC operations for investigating the integration level of product development and production with customers: (1) vendor managed inventory, (2) plan, forecast, and replenish collaboratively, and (3) just-in-time replenishment. As usual, mean value, standard deviation, and Skewness and Kurtosis were firstly checked to test data normality, and the result showed that all data of three measurement items are normally distributed. And then, a factor analysis was done to check the construct validity. The test results indicated that the Kaiser-Mayer-Olkin (KMO) measures of performance adequacy were 0.704, Bartlett's test of sphericity was significant, Factor loading for all four items exceeded 0.81, and the results of Cronbach's α in factor exceeded 0.79.

Finally, according to IMSS-V, there are also three measurement items for investigating the firm's PIC: (1) product customization ability, (2) time to market, and (3) product innovativeness. The results of mean value, standard deviation, and Skewness and Kurtosis showed the data normality is significant for these three measurement items. The results of construct validity test indicated that the Kaiser-Mayer-Olkin (KMO) measures of performance adequacy were 0.701, Bartlett's test of sphericity was significant, Factor loading for all three items exceeded 0.82, And also, the test result of Cronbach's α in factor exceeded 0.77.

4. RESULTS AND DISCUSSION

In this section, analyses of test results for those three hypotheses of this study are presented. The regression method was employed for the analysis

The test results proved that establishment of DWS ($p < 0.05$, $F = 21.432$) and establishment of FSWf ($p < 0.05$, $F = 19.309$) both have significant positive effect on CC effectiveness. And also, CC effectiveness by DWS and FSWf it is indeed good for achieving high product innovation performance ($p < 0.05$, $F = 7.009$). All test results for those three hypotheses are summarized in Table I.

Table 1: Test results

Hypotheses	Results
H1: DWS positively affects CC effectiveness	Supported F=21.432 p=.000***
H2: FSWf positively affects CC effectiveness	Supported F=19.309 p=.000***
H3: CC effectiveness positively affects PIC	Supported F=7.009 p=.009***

According to test results, it could be found that establishing of DWS and FSWf are critical successful factors for manufacturing firms to build an effective SC framework for upgrading their

PIC. Meanwhile, it also could be deduced why the DWS and FSWf play important roles on CC.

5. CONCLUSION

The objective of this empirical study is to identify the key factors that will affect the successful execution of CC. The test results showed that two factors, DWS as well as FSWf, are able to significantly influence the effectiveness of CC. In addition, the test results also proved that an effective CC framework can significantly improve the PIC of manufacturing firms. In the implication, manufacturer can consider the result to construct an effective CC framework and to secure high innovative performance through successful execution of CC. On the other hands, researchers can refer to the result to explore deeply the issues of CC.

Since empirical studies with regard to CC are still rare, future research may consider exploring more thoroughly which could are factors affecting the successful introduction and execution of CC.

[Note] The result of this study has been presented in 「The 2012 IAENG International Conference on Industrial Engineering/International MultiConference of Engineers and Computer Scientists 2012 (IMECS 2012)」: D. Y. Sha, Kun-Chih Huang, P.K. Chen (2012.03), "A Study on the Key Factors of Customer Chain Effectiveness", Proceedings of the International MultiConference of Engineers and Computer Scientists 2012, Hong Kong, pp. 1259-1262.

APPENDIX

A. Result of data normality test

	Mean	Std. Dev.	Skewness	Kurtosis
DWS				
1.scouting/pre-quality	3.0742	1.35034	-0.136	-1.098
2.RFx	3.6812	1.14273	-0.560	-0.335
3.data analysis	3.5546	1.10137	-0.537	-0.265
4.order management/tracking	3.9127	0.97839	-0.702	0.155
5.contact/document management	3.7974	1.06986	-0.747	0.129
FSWf				
1.power-by-hour	3.1179	1.36661	-0.246	-1.160
2.product upgrade	2.8690	1.38613	0.008	-1.250
3.helpdesk/customer support	3.0658	1.42355	-0.098	-1.285
4.engaging in expanding service offering	3.0611	1.31313	-0.243	-1.048
5.developing skills to improve service offering	3.2882	1.21572	-0.480	-0.659
CC Effectiveness				
1.vendor managed inventory	3.4105	1.07486	-0.578	-0.019
2.plan, forecast and replenish collaboratively	3.6157	0.94633	-0.290	-0.128
3.just-in-time replenishment	3.4061	1.08262	-0.446	-0.280
PIC				
1.product customization ability	3.5639	0.88203	0.038	-0.545
2.time to market	3.4513	0.87424	0.191	-0.640
3.product innovativeness	3.4167	0.89398	0.197	-0.517

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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：101 年 08 月 28 日

計畫編號	NSC 100－2221－E－216－008－		
計畫名稱	整合設計鏈與顧客鏈建構高創新力供應鏈之研究(II)		
出國人員姓名	①沙永傑 ②黃崑智	服務機構及職稱	①中華大學科技管理學系 ②本計劃講師級兼任助理人員
會議時間	100 年 03 月 14 日至 100 年 03 月 16 日	會議地點	Hong Kong (香港)
會議名稱	（中文）2012 IAENG 國際工業工程研討會 (ICINDE 2012) （英文）The 2012 IAENG International Conference on Industrial Engineering		
發表論文題目	（中文）影響顧客鏈有效執行關鍵因素之探討 （英文）A Study on the Key Factors of Customer Chain Effectiveness		

一、參加會議經過

2012 IAENG 國際工業工程研討會，是由國際非營利組織 IAENG（International Association of Engineers）於香港舉辦的 IMECS 2012 (the International MultiConference of Engineers and Computer Scientists 2012)之工業工程主題研討會。 IMECS 聚焦於工程理論與應用以及計算機科學領域的主題，每年會議皆吸引來自超過五十個國家的近千位學者專家與會。2011 年秋獲悉本屆研討會的訊息後，便積極準備投稿，2011 年 12 月 08 日將論文全文投出，于 12 月 15 日收到論文接受通知(註：本屆論文投稿 892 篇，被接受 487 篇，投稿被接受率為 54.6%) ；2012 年 01 月 09 日將 Camera-Ready Paper 寄出，隨即便收到主辦單位確認信函。之後即開始後續報名與行程安排，於 03 月 14 日搭機前往香港參加 ICINDE 2012 研討會。

我們的報告被安排在 03 月 15 日 13:00~14:30 時段的第二篇發表。報告十五分鐘，之後有與會學者提問，提問的內容皆相當有深度且有意義，部份學者特別對 IMSS-V 跨國合作問卷調查事項感到興趣。這個 session 所發表的 5 篇論文，涵蓋不同產業的供應鏈管理議題，透過自己與其他學者的報告還有問題討論的互動，可以充分了解我們的研究內容中仍可進行修正之處，另一方面也了解到，供應鏈管理議題在國際上主要的研究方向。

二、與會心得

本屆 IAENG 國際工業工程研討會，主題涵蓋近年來學術與產業界的研究與發展，包含的主軸有：Engineering Physiology, Biomedical Instrumentation, Engineering Statistics, Quality Management Systems, Maintenance Engineering, Reliability and Quality Control, Engineering Experimental Design, Integrated Product Engineering, Engineering Risk and Decision Analysis, Computer Supported Collaborative Engineering. Human Factors and Ergonomics, Computer-Aided Design, Computer Aided Manufacturing, Computer Simulation Methods, Facilities Design and Logistics, Manufacturing Processes and Methods, Information Systems for the Manufacturing, Quality and Productivity Management, Optimization Methods, Intelligent Engineering Systems, Engineering Management and Leadership。除了前述工業工程領域外，IMECS 2012 亦同時舉行 Artificial Intelligence and Applications, Bioinformatics, Control and Automation, Computer Science, Communication Systems and Applications, Data Mining and Applications, Electrical Engineering, Imaging Engineering, Internet Computing and Web Services, Operations Research, Scientific Computing, Software Engineering 等不同領域主題的研討會，提供與會學者一個跨領域交流的機會。

透過參與此次會議，對於演講者/論文發表者的講題，不僅可以瞭解到目前國外學者的研究方向，於此當中，亦強化與國外學者間之互動，同時也更深刻體認到學術交流的重要性，當然，參與的場次中聽眾皆有相當熱烈的回應與討論。透過此次會議的參與，吸收了更多寶貴的經驗，也藉由與國外學者的密切互動，讓自己更加瞭解未來工業工程與管理發展的趨勢。

P.S. 舉辦國際研討會實有利於觀光產業的推動，香港、新加坡、馬來西亞、印尼等國近年來皆積極地舉辦國際研討會；值得國內相關單位和產業借鏡。

三、攜回資料名稱及內容

1. 大會手冊一本
2. 大會論文摘要集一本
3. 大會論文光碟一片
4. 環保背包一只
5. 與在場學者交流之名片

四、論文摘要

Facing today's highly volatile global market, the industries have well accepted the concept of supply chain management (SCM) that integrating upstream and downstream to improve the competitiveness of products. However, product innovation capability becomes critical once most of the competitors sit on equal SCM basis. The relative studies showed that traditional collaboration between manufacturer and supplier had limited help to the innovation of product and no rigid connection between the "collaboration" and "product innovation" in the industries. The disadvantage of product innovation in traditional supply chain may be explained by over-emphasis on manufacturing operation in the past. In order to solve the problem of product innovation, although both design chain and customer chain have been suggested by practitioners and scholars recently to be integrated into traditional supply chain. To our best effort, the studies and literatures are still scarce, especially for customer chain. This empirical study conducted by regression to discover thoroughly regarding key factors that may influence the effectiveness of customer chain to be integrated into traditional supply chain. The analysis results reveal that situations of data warehousing system as well as flexible service workflow are the major factors.

Keywords: customer chain, data warehousing system, flexible service workflow, product innovativeness, International Manufacturing Strategy Survey

五、論文被接受發表之大會證明文件

IAENG INTERNATIONAL ASSOCIATION OF ENGINEERS

International MultiConference of
Engineers and Computer Scientists 2012

Hong Kong, 14-16 March, 2012

Certificate of Paper Presentation to

Prof. D.Y. Sha

[redacted]

A Study on the Key Factors of Customer Chain Effectiveness

**The 2012 IAENG International Conference on
Industrial Engineering**

IAENG INTERNATIONAL ASSOCIATION OF ENGINEERS

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Certificate of Paper Presentation to

Mr. Kun-Chih Huang

A Study on the Key Factors of Customer Chain Effectiveness

The 2012 IAENG International Conference on Industrial Engineering

國科會補助計畫衍生研發成果推廣資料表

日期:2012/08/26

<table>
<tr><td rowspan="3">國科會補助計畫</td><td>計畫名稱: 整合設計鏈與顧客鏈建構高創新力供應鏈之研究（II）</td></tr>
<tr><td>計畫主持人: 沙永傑</td></tr>
<tr><td>計畫編號: 100-2221-E-216-008-　　　　學門領域: 生產系統規劃與管制</td></tr>
<tr><td colspan="2">無研發成果推廣資料</td></tr>
</table>

100 年度專題研究計畫研究成果彙整表

計畫主持人：沙永傑　**計畫編號：**100-2221-E-216-008-

計畫名稱：整合設計鏈與顧客鏈建構高創新力供應鏈之研究（II）

成果項目			量化：實際已達成數（被接受或已發表）	量化：預期總達成數(含實際已達成數)	量化：本計畫實際貢獻百分比	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）
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	0	0	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	0	0	100%	人次	
		博士生	1	1	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	1	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%		

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。)	1. Joined IMSS-V (International Manufacturing Strategy Survey) program: collected 31 enterprises' sample data in Taiwan and received 725 enterprises' sample data from 21 countries worldwide (including Taiwan) 2. The IMSS-V database could be used for further research work regarding the subjects of Manaufacturing Strategy, Supply Chain Management, Design Chain Management, Customer Chain Management and so on.

	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）

已發表研討會論文一篇，期刊論文投稿中。

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）

本計劃研究成果已於國際研討會發表論文一篇，可見研究成果已受到國際學者的肯定；另外，期刊論文亦在投稿中。未來，透過期刊論文的發表，將可啟發更多領域學者專家針對供應鏈整合顧客鏈相關議題進行更多的理論與實證研究，進而協助產業應用相關研究成果提升其創新能力。