INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, IT & MANAGEMENT

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CONTENTS

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    STATEMENT OF THE PROBLEM

    OBJECTIVES

    HYPOTHESES

    RESEARCH METHODOLOGY

    RESULTS & DISCUSSION

    FINDINGS

    RECOMMENDATIONS/SUGGESTIONS

    CONCLUSIONS

    SCOPE FOR FURTHER RESEARCH

    ACKNOWLEDGMENTS

    REFERENCES

    APPENDIX/ANNEXURE

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BOOKS
- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS
- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES
- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS
- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES
- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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WEBSITES
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vi

A STUDY ON THE FACTORS AFFECTING RFID ADOPTING INTENTION OF ONLINE SHOPPING LOGISTICS PROCESS: CASE OF TAIWAN ONLINE RETAIL BUSINESS

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ABSTRACT

The purpose of this study is going to investigate how RFID technology is implemented and adopted in Taiwan's online retail stores. Specifically, this study focused on the positive influences of using RFID technology in online retail business, which located on two most popular online shopping malls in Taiwan-Yahoo shopping center and PCHOME online shopping. This study also aimed to determine the factors of concern about adopting an RFID technology into current logistics management systems. An integral part of this research is going to develop and empirically test a model of the adoption of RFID in the context of the logistics process in Taiwan Online retail store on Yahoo shopping center and PCHOME online shopping. Based on the concepts of Rogers innovation diffusion theory, Davis technology acceptance model, and theory of reasoned action, this research used a questionnaire to assess Taiwan online stores' cognition and perspective of the perceived usefulness of, perceived ease of use of, cost, normative belief about, and motivation to comply toward RFID systems, as well as to assess their attitudes toward an RFID system and intentions of using such a system into its shipping and logistics process. Finally, based on the research results, managerial implications and opportunities for future research will be suggested in both academic and practical.

KEYWORDS
Intelligent logistics, RFID System, Online Shopping Logistics, Online Retail Business.

INTRODUCTION
RESEARCH BACKGROUND
An Online retail store is a website based platform that includes four flows of e-commerce: business flow, logistics/goods flow, money flow and information flow (Ho, 2012). Owing to the competitive market of online shopping, the author of this research believes that online stores must have an efficient "logistics flow/process" to stand out online store's competitive advantages and service features. Logistics tasks heavily depend on reliable and accurate shipment and tracking information. For this reason, online store and its logistics process today has evolved into a high-technology task.* The popularity of online shopping is a global phenomenon, as well as in Taiwan. According to Taiwan Network Information Center (July 2012), 77.25% of Taiwan citizen above twelve years old had online surfing experiences. Surveys of Internet users have revealed that 59.62% of Internet users in Taiwan reported they had shopped online, just behind the rate of "Social Media service" usage 76.62%.

Changing consumer lifestyles and lack of time may make it more difficult for consumers to shop at physical locations such as stores and shopping malls (Davies 1995, Cheeseman and Breddin 1995). In the increasingly competitive market, the main concern for online sellers has shifted from inducing consumers to adopt their online channels to motivating consumers to make repeat purchases through these channels (Chiu, 2011). From online shoppers points of view, shopping online are convenience and timesaving, as compared to shopping in physical stores.

According to a report of Institute for Information Industry (2008), most of online shoppers care about how fast and how easy they can get their online orders.

A report from Lifestyle Monitor Survey 2011 discovered that online consumer' concerns when shopping online fall into two major categories: logistics and products. Within the context of Online retail logistics, the top concerns releateed to shipping costs (89%), return policy (80%), shipping time (67%) and product availability (67%). Moreover, from the aspect of the competitive advantage, Insightxplorer Limited (2012) discovered that over 43% of consumers pay much attentions about Fast delivery guarantee then product price (26%), followed by free return and exchange (17%), and finally the free shipping offers (14%). According to those numbers above, fast and convenience are the most critical advantages for online stores. GartnerG2 research director David Schehr mentioned that all of their research shows that consumers are most interested in convenience, not price. According to him, shoppers do still expect bargains online, but fast delivery and a wide selection are more important factors; price comes into the picture along with convenience, but it's no longer the main reason people shop online (Regan 2002).

RESEARCH MOTIVATION
The world largest online retail business, Amazon.com acquired logistics technology firm Kiva systems for $775 million in March 2012. Amazon.com is a retail company and they must have done a thorough cost benefit analysis to determine that Kiva systems make their order distributions more efficient says Sanjay Sarma, one of the founders of the MIT Auto-ID Center, and recently named chairman of the EPCglobal Board of Governors.

Logistics could be the main reason that online store can really offers a convenient shopping environment to consumers. Those shopping trips around shopping malls, supermarkets and department stores had been substituted by online retail logistics. "Logistics is going to play a major role in this picture. Gone will be the days of the consumers going the so-called "last mile" – taking their purchases home themselves. Online shopping makes retailers responsible for the last mile – and it becomes a huge competitive element (Paludan, 2012)." Retailers who work with the most innovative logistics providers will win the day. Those logistics companies/departments will really have to keep an eye on the future and what people's needs are. Therefore, shipping efficiency and lower shipping charges from the logistics process can be major competitive advantages for online stores.

PURPOSE OF THIS STUDY
Since 2003, mass consuming markets have demonstrated a significant shift toward Radio Frequency Identification (RFID) technology. This has occurred not only because of RFID mandates imposed by Wal-Mart, but also the wide use of RFID by government sectors (Wang, 2011). Journalists and researchers (Sabbaghi, 2007; Vaidyanathan, 2007) have found that a growing number of business use RFID in their supply chain, inventory, and manufacturing processes.

The ability of RFID system offers a great value -added technology that increases significant value to logistic process. Utilizing the RFID read-write technology not only provides faster products distribution from keeping low and safe inventory to smoothing supply chain stream flow, but also increase substantially the accuracy of current location data and equipment availability.

Base on all these Online retail background and online consumers' concerns that discussed above, the researcher of this study tends to understand how the RFID technology can be implied and adopted into the logistics process of Taiwan Online retail business. The purpose of this study is going to determine the concern factors of adopting the RFID system into current logistics works for Taiwan online retailers.

RESEARCH QUESTIONS
Based on the research background and purpose of the study, this investigation attempted to examine various factors of RFID implementation of logistics process of Taiwan online retailers'. This paper seeks to answer the following research questions:

1. What factors influence RFID technology acceptance in the logistics process of Taiwan online retailers?
2. What are the barriers to RFID adoption in the logistics process of Taiwan online retailers?
3. What factor influences the awareness of RFID technology adoption in the logistics process of Taiwan online retailers?
4. What factors affect RFID implementation in the logistics process of Taiwan online retailers?

REVIEW OF LITERATURE
FUNDAMENTAL THEORIES
The general problem that inspired this research was to determine how the Intelligent Logistics could be adopted smoothly and successfully in the logistics process of Taiwan online business. The diffusion of RFID in logistics task of online stores application in Taiwan, the acceptance of using RFID technology among logistics companies in Taiwan and how the theory of reasoned action toward RFID adoption of Taiwan Online retail business are going to be studied. Using three fundamental theories: diffusion of innovation theory (DIT), technology acceptance model (TAM) and the theory of reasoned action (TRA) significant results were explained in the future.

An integral part of this research is going to develop and test a model empirically of the adoption of RFID in the context of online shopping stores in Taiwan. Based on the concepts of Rogers (1983) the theory of technology diffusion, Davis' (1989) the Technology acceptance model (TAM), and Ajzen and Fishbein (1975) the theory of Reasoned Action (TRA), this research is going to use a questionnaire to assess the logistics process of Taiwan online stores about the managers of online stores' cognitions of the compatibility, complexity, relative advantage, and cost of the RFID system adoption, as well as to assess their attitudes toward the RFID system and intentions of using the system.

INNOVATION DIFFUSION THEORY (IDT)
According to Rogers (1983), —diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system". (p.5) In Rogers definition: "innovations that are perceived by individuals as having greater relative advantage, compatibility, trialability, and observability and less complexity will be adopted more rapidly than other innovations" (p.16). Innovations with the cluster of opposite characteristics require a longer diffusion period. There are many studies that indicate that these five qualities are the most important characteristics of innovation in explaining the rate of adoption.

TECHNOLOGY ACCEPTANCE MODEL (TAM)
The technology acceptance model (TAM) was introduced to the academic world by Davis (1989) in his paper "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology" in MIS Quarterly. Some studies have indicated that TAM is the revised version of the main concepts of Theory of Reasoned Action (Ajzen and Fishbein, 1980). The goal of TAM is to predict new technology acceptance and diagnose design problems before users have experience with this particular technology. TAM predicts that user acceptance of any technology is determined by two internal beliefs: perceived usefulness (PU) and perceived ease of use (PEU) (Davis, 1989), which are the outside factors can influence user intention to use a technology. These are two key beliefs determining user Behavioral Intention to use (Davis, 1989; Davis, Bagozzi and Warshaw, 1989). PE and PEU are the independent variables that explain the relationship between users and a new technology system and ascertain the determinants of technology acceptance. The dependent variables are users' attitudes (A), behavioral intentions (BI), and usage behaviors (UB). Davis (1989) formed those variables into the Technology Acceptance Model.

THEORY OF REASONED ACTION (TRA)
The theory of Reasoned Action was developed by Martin Fishbein and Icek Ajzen, which as an improvement over Information Integration theory (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). In Ajzen and Fishbein's (1980) theory, the intention toward a behavior is the best predictor of the actual behavior. According to the theory of reasoned action (TRA), Behavior Intention (BI) is to predict and understand individual behavior in a social context, which included two determinates: the individual's Attitude (A) toward the new concept, and Subjective Norm (SN)-a person's perception of social pressure.

INTELLIGENT LOGISTICS- RADIO FREQUENCY IDENTIFICATION (RFID) TECHNOLOGY
Radio Frequency Identification (RFID) technology is defined as a "wireless data collection technology that uses electronic tags for storing data and recognizing data" (Expert Barcode & RFID, Inc., 2009, ¶ 5), and then uses radio waves to automatically identify any objects that have RFID tags. Sandip Lahiri, an RFID Solution Architect with IBM Global Services, indicated in his RFID Sourcebook (2006) that "RFID is an example of automatic identification (Auto-ID) technology by which a physical object can be identified automatically. Other examples of Auto-ID include barcode, biometric (for example, using fingerprint and retina scan), voice identification, and optical character recognition systems." (p. 1)

The use of Radio Frequency Identification (RFID) in tracking and access applications first appeared during the 1980s. As the technology has been refined, more pervasive and possibly invasive uses for RFID systems have quickly gained the retail industry's attention because of RFID's ability to track moving objects. Like the barcode system, RFID is a technology that can scan for tracking purposes, but the functions of RFID go much further than barcodes.

RESEARCH METHODOLOGY
The major objective of this study is going to investigate how the intelligent logistics-RFID system can be adopted and accepted in the context of Taiwan online stores' logistics process. In accordance with the research framework and hypotheses, the researcher of this study requested permission to use the Technology Acceptance Model (TAM) from its developer, Dr. Fred Davis, and adapted his perceived of usefulness and perceived ease of use measurement scale to organize a questionnaire suitable for this research. The research population is comprised Taiwan online stores who sell products via pchome online shopping mall and yahoo online shopping center, the first and second website that shopper's most love to shop online.

FIGURE 1: RESEARCH FRAMEWORK
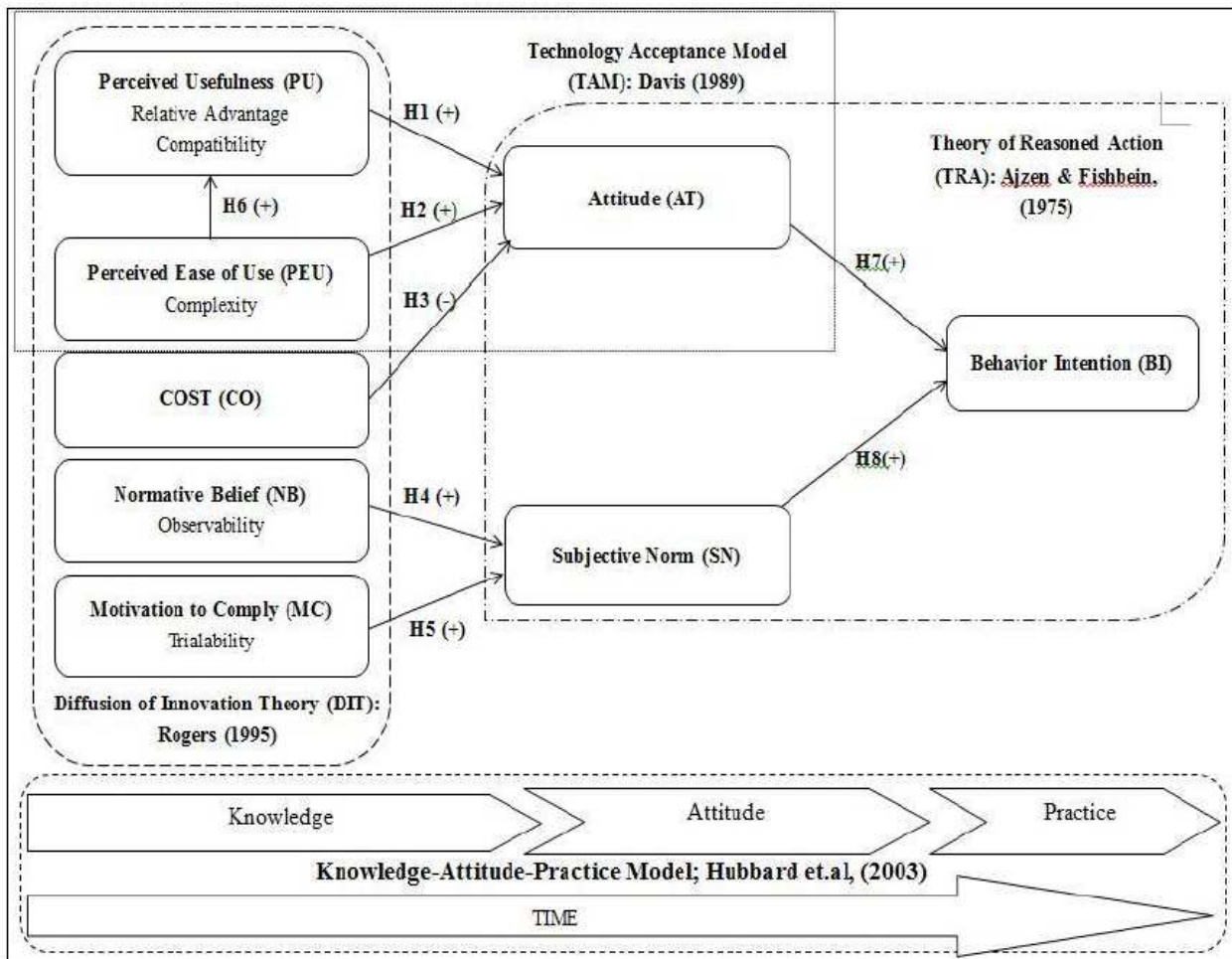
SOURCE: Organized by the author of this study, Apr.2014.

RESEARCH HYPOTHESES

The hypotheses for the research questions are listed below:

H1: The Perceived Usefulness/Relative Advantage/Compatibility of RFID system positively affects the Attitudes toward RFID adoption in logistics process of Taiwan online retailers.

H2: The Perceive Ease of Use/Complexity of RFID system positively affects the Attitude toward RFID adoption in logistics process of Taiwan online retailers.

H3: The Cost of adopting RFID system negatively affects the Attitude toward RFID adoption in logistics process of Taiwan online retailers.

H4: The Normative Belief/Observability of RFID system positively affects the Subjective Norm of RFID adoption in logistics process of Taiwan online retailers.

H5: The Motivation to Comply/Trialability of RFID system positively affects the Subjective Norm of RFID adoption in logistics process of Taiwan online retailers.

H6: The Perceive Ease of Use/Complexity of RFID system positively affects the Perceived Usefulness of RFID adoption in the logistics process of Taiwan online retailers.

H7: The attitude of using RFID system positively affects the behavioral intention of RFID adoption in logistics process of Taiwan online retailers.

H8: The Subjective Norm of RFID system positively affects the behavioral intention of RFID adoption in logistics process of Taiwan online retailers.

RESEARCH POPULATION

The research population is comprised Taiwan online stores who sell products via pchome online shopping mall and yahoo online shopping center. According to EZprice Analysis Report revealed in July 2013, the biggest and second largest online shopping platforms are pchome online shopping and yahoo shopping center. It owns closely over 15,000 online retail stores. For this reason, this study plans to use the purposeful sampling method and a questionnaire survey method will be used to collect primary data from online retail stores, which located on Yahoo shopping center and Pchome online shopping.

DATA COLLECTION AND ANALYSIS

The research population for this study was the online retail companies list under the 2013 power online seller competition held by Business Next Publishing Corp., Taiwan most influential tech-media, and those online retailer lists published in July 2013, a total of 232 companies were the research population. The survey operated in January 2014, after a month survey period, there were 201 valid questionnaires collected, yielding a usable response rate of 86.6 percent.

DATA COLLECTION PROCEDURE

The author of this researcher is going to set one month up as the operation time. Owing to the fact that the sample companies are widely spread across many different cities and counties in Taiwan, an e-mail survey method will be used in this research. According to Rogelberg and Luong (1998) the typical return rate for a mailed questionnaire is 50% or less, and in recent years it has steadily declined. For this reason, a reminder e-mail will followed up after the first week and to enhance the response rate.

RESEARCH FRAMEWORK

To organize fundamental theories tighter, author of this research arranged the diffusion of innovation's five categories: attributes of an innovation, relative advantage, compatibility, observability, complexity, and trialability of the RFID system adoption as survey questions for this research to evaluate the perceived attitude, subjective norms, and the behavioral intention regarding Taiwan online retailers' RFID adoption. Therefore, the technology acceptance model (TAM), theory of reasoned action (TRA), and diffusion of innovation theory (DIT) were the basic foundation of the research framework, as shown in following Figure.

VALIDITY AND RELIABILITY

The instrument of this research was developed with relevant references, key literature reviews and critical theory of Davis' (1989.) as the fundamental knowledge. Questions are abstracted from the most important points of the fundamental knowledge base. Thus, the questionnaire consisted of valid and crucial questions.

The construct reliability is tested using composite reliability measures that assess the extent to which items in the construct measure the latent concept. A commonly acceptable threshold value for composite reliability (CR) is 0.7 or more (Hair et al., 1998). Table below shows that the composite reliability (CR) of the latent variable was higher than 0.7, which indicated that all measures had a good reliability (Bagozzi & Yi, 1998; Hair et al., 1998) Moreover, the completely standardized factor loadings all reached the level of significance. All the latent variables had a CR above 0.70 and an average variance extracted (AVE) above 0.5.

TABLE 1: CONFIRMATORY FACTOR ANALYSIS (CFA) RESULTS FOR THE CONSTRUCTS

		Standardized Regression Weigh	Cranach's α	C.R.	AVE
Perceived Usefulness	B2	0.734	0.758	0.761	0.515
	B5	0.727			
	B8	0.692			
Perceived Ease of Use	B10	0.792	0.917	0.919	0.739
	B11	0.925			
	B12	0.900			
	B13	0.815			
Observability	B22	0.832	0.922	0.927	0.810
	B23	0.953			
	B24	0.910			
Trialability	B18	0.861	0.870	0.873	0.697
	B19	0.829			
	B20	0.814			
Cost	B25	0.876	0.834	0.839	0.636
	B26	0.760			
	B27	0.751			
Attitude	B35	0.930	0.900	0.905	0.763
	B36	0.904			
	B37	0.780			
Subjective Norm	B28	0.926	0.941	0.942	0.845
	B29	0.946			
	B30	0.884			
Behavior Intention	B38	0.932	0.892	0.898	0.747
	B39	0.884			
	B40	0.770			

SOURCE: this research

DISCRIMINANT VALIDITY

Discriminant validity measures the extent to which conceptually similar constructs are distinct. Discriminant validity is examined by comparing the correlation between the construct and the square root of AVE. AVE represents the overall amount of variance in the indicators accounted for by the latent construct. The AVE should be greater than the square of correlations between the construct for satisfactory discriminant validity (Bhattacherjee et al. 2004; Wixom et al. 2005). As shown in Table below, diagonal was AVE of constructs and the other were two dimensions of correlation coefficients. All correlation coefficients were less than AVE. Hence, the discrimination validity was adequate.

TABLE 2: DISCRIMINANT VALIDITY

CONSTRUCT	PU	PEU	OB	TA	CO	AT	SN	BI
PU	**0.515**							
PEU	0.066	**0.739**						
OB	0.053	0.097	**0.810**					
TA	0.189	0.166	0.313	**0.697**				
CO	0.050	0.033	0.005	0.062	**0.636**			
AT	0.115	0.092	0.114	0.083	0.020	**0.763**		
SN	0.003	0.042	0.127	0.105	0.012	0.009	**0.845**	
BI	0.294	0.080	0.109	0.331	0.042	0.106	0.031	**0.747**

SOURCE: this research

STATISTICAL RESULTS

TABLE 3: RESULTS OF THE HYPOTHESES AND THE PRACTICAL PATH

	Hypothesis	Expected Result	Standard Regression coefficient	t-Value
PU→PEU	H1	+	0.197	2.631**
PU→AT	H2	+	0.346	4.220***
PEU→AT	H3	+	0.274	3.767***
CO→AT	H4	-	0.308	4.158***
OB→SN	H5	+	0.268	2.908**
TR→SN	H6	+	0.204	2.139*
AT→BI	H7	+	0.189	3.987***
SN→BI	H8	+	0.244	2.761**

Fit index	Threshold	Goodness-of-fit	Source
χ^2/df	<3	2.191	Hair et al.(1992)
GFI	>0.8	0.828	Seyal et al.(2002)
AGFI	>0.8	0. 874	Scott(1994)
NFI	>0.8	0.858	Bentler & Bonett(1989)
CFI	>0.9	0.917	Bentler &Bonett(1989)
RMSEA	<0.08	0.077	Hair et al.(1992)

FIGURE 1
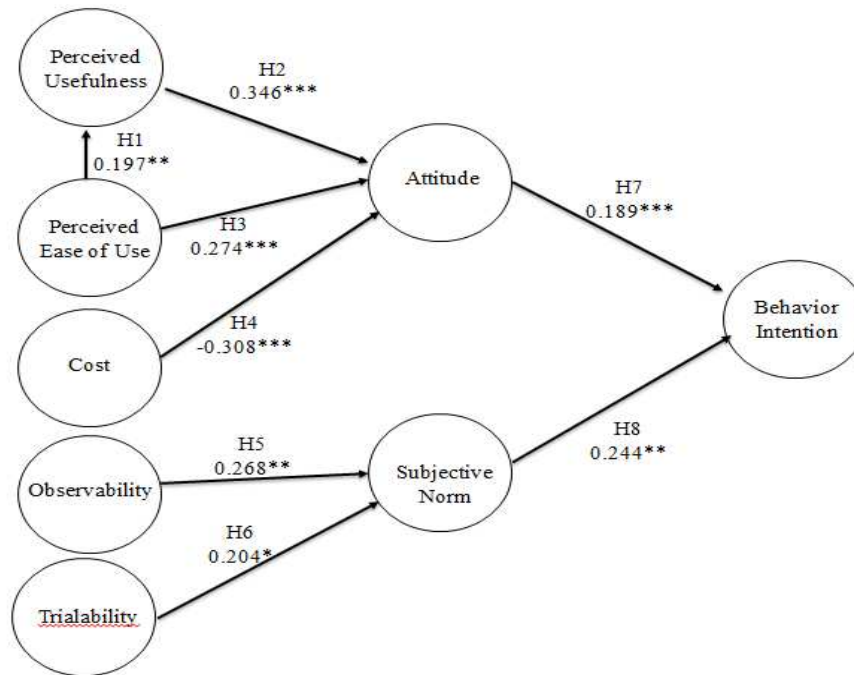
SOURCE: this research

CONCLUSION

This quantitative study utilized a questionnaire to identify Taiwanese online retailers' adoption intentions toward intelligent logistics tool- the RFID systems into its shipping/logistics process. Statistical analysis of questionnaire results provided insight into how the behavioral intention toward RFID system acceptance relates to attitudes toward belief and subjective norms—aspects central to Rogers' (1995) diffusion of innovation theory. Information acquires from this study may provide significant information for analyzing and developing future business intelligent concept and RFID adoption within online shopping market in Taiwan. Furthermore, applying this research model toward other industries may prove beneficial for Taiwanese companies in industries other than online retail stores.

The results of this study showed, that the most concerned issue of online retailers is the fulfillment speeds of its logistics tasks, for instance, order fulfillment, delivery guaranteed, etc. Moreover, the logistics task always needs real-time technology systems to support its logistics operations, such as point of sale, inventory management, and supply chain management.

This practical result was in accordance with the literature studies discussed in chapter two that showed that RFID application can significantly benefit and assist users. (Kevan, 2004; Murphy, 2005; Gagel 2007; Bianchin, 2007; Dortch, 2009). It showed that the Taiwanese online retail company attaches importance to those functions that an RFID system can improve or provide: storage management, access control security systems, inventory management, transportation management, and logistics and tracking. The research findings showed that those important functions match the key procedures of the online retailers shipping workflow. The Taiwanese Online retail business found that if the company can properly utilize all functions of the RFID system, it can not only help to improve the company's competitive ability, but it can also optimize the company's resource relocation. Furthermore, this research suggests that online retailers can start the RFID system adoption process from the inventory management, access control security system, and logistics and tracking functions, and from there assist the original workflow to supersede these tasks in the long term.

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