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International Journal of Organizational Innovation

TIME-ORIENTATION AS A PRECURSOR TO COPING RESPONSES IN ENTREPRENEURS

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Abstract

In this paper, we evaluate the application of established coping typologies to stress and coping among entrepreneurs. We posit that traditionally-adopted coping typologies that focus on the function of coping responses such as task- or emotion-oriented, may not adequately differentiate effective and ineffective coping in entrepreneurs, and that temporal dimensions of coping should be considered when assessing coping in this occupational group. We urge scholars to adopt a wider temporal lens through which to investigate coping responses in entrepreneurs.

Keywords: entrepreneur, coping, stress, time-orientation, proactiveness

Introduction

Stress is a widely acknowledged accompaniment to entrepreneurship (Cardon & Patel, 2013; Kariv, 2012). When experienced over long time periods, stress may result in 'strain', negative psychological and physical health outcomes (Shinn, Rosario, Mørch, & Chestnut, 1984). Stress in entrepreneurs is reported to have negative implications for entrepreneurs' health, ranging from minor physical ailments to psychological breakdown (Stephan & Roesler, 2010).

Coping responses moderate the effect of stress on strain, with adaptive coping strategies attenuating its effect (Carver & Connor-Smith, 2010). Individual differences such as personality traits may serve as vulnerability/ resistance factors which influence coping strategy selection (Connor-Smith & Flachsbart, 2007). Personality traits have a long history as explanatory mechanisms in the occupational stress

literature (see Suls, David, & Harvey, 1996, for an historical overview).

Perhaps due to the infancy of entrepreneurship as a scholarly domain, the influence of entrepreneurial personality characteristics (e.g. future-orientation) on coping strategy selection remains largely unexplored. In addition, little is known about adaptive coping responses among entrepreneurs

Scholarly discussion of occupational stress among entrepreneurs has been largely informed by theoretical assumptions derived from studies of stress and coping in the organisationally employed. While the entrepreneurship domain has historically benefited from the application of theories from other disciplines, the non-uniformity between occupational groups must be considered.

Entrepreneurs as a Unique Occupational Group

Studies investigating relative levels of stress between entrepreneurs versus organisationally employed workers have produced inconsistent findings. Some studies have shown that entrepreneurs report lower levels of stress and higher levels of well-being (Andersson, 2008; Baron, Franklin, & Hmieleski, 2016). Other studies have found that entrepreneurs are worse off than wage-earners (Cardon & Patel, 2013; Jamal, 1997), while some studies report no differences (see e.g. Oren, 2012). One explanation for the disparities in findings is that existing stressor measures, derived from organisational research with salaried workers fail to capture stressors unique to entrepeneurs (Grant & Ferris, 2012). Patzelt and Shepherd (2011) suggested that the process by which stress converts into strain outcomes may differ between employees and the entrepreneurs. This difference is in part attributed to entrepreneurs having greater levels of autonomy in their workplace; entrepreneurs may alter working conditions to suit their coping responses.

Entrepreneurs may also be more psychologically prepared to deal with stressors than managers, owing to their personality characteristics (Rahim, 1996). A characteristic widely considered to distinguish entrepreneurs is proactivity i.e. a future-oriented perspective (Becherer & Maurer, 1999; Bolton & Lane, 2012; Crant, 1996; Rauch, Wiklund, Lumpkin, & Frese, 2009). Bluedown and Martin (2008) found evidence to suggest that the degree to which an entrepreneur looks to the future (i.e. trait future orientation) negatively correlates with general life stress.

Coping: An Influencing Variable in the Stress-Strain Relationship

The number of coping strategies and the contexts within which coping occurs is virtually infinite. As such, we discuss coping in reference to typologies (i.e. taxonomies or classifications; cf. Carver & Connor-Smith, 2010) that have been established independent of context.

Typologies have focused on classifying coping responses into meaningful categories based on dimensions such as function (e.g. problem-focused versus emotion-focused coping, approach versus avoidance coping, and accommodative coping), time (e.g. proactive and preventative coping) and

meaning (e.g. finding benefit in stressful experiences) (Carver & Connor-Smith, 2010). Of these coping typologies, the ones which are prominently used in entrepreneurship coping research are discussed below.

Coping as a Function-oriented Process

Classifying and measuring coping according to emotion- and problem-focused strategies has dominated the study of coping responses in entrepreneurs (Patzelt & Shepherd, 2011). Within these classifications, coping involves, respectively, actively addressing the source of stress to reduce or remove it, or regulating emotional responses to stress (Carver & Connor-Smith, 2010).

Research findings with respect to the efficacy of emotion-focused versus problem-focused coping in an entrepreneurship context are not clear cut. A qualitative study of stress and coping in entrepreneurs (Schonfeld & Mazzola, 2015) found that participants reported using problem-focused coping strategies three times more frequently than emotion-focused coping strategies. Carver & Connor-Smith, (2010) found problem-focused coping strategies were predominantly enacted by entrepreneurs to cope with economic aspects of entrepreneurship (i.e. lack of income), but were not used in response to social, psychological or physiological stressors. An exploratory study investigating how New Zealand entrepreneurs cope with venture failure (Singh et al., 2007), reported that emotion-focused coping strategies such as 'reframing' and 'personal re-examination' led to learning from venture failure.

In the context of personal well-being and venture performance, entrepreneurs abandon emotion-focused coping strategies in preference for problem-focused ones to achieve more adaptive outcomes. They suggested that entrepreneurs who use emotion-focused coping could be trained in problem-focused coping to improve strain outcomes. Recommendations such as this are somewhat limited in that variation in the adaptive/ maladaptive nature of individual coping strategies within the problem-focused and emotion-focused categories is lost. For example, this dichotomous approach fails to classify strategies according to whether coping is enacted to engage with (i.e. approach) stressors or disengage from (i.e. avoid) stressors.

More recent typologies aim to differentiate positive and negative emotion- and problem-focused coping strategies, and encompass problem-focused and emotion-focused strategies within the higher-order dimensions of 'approach' (engagement) and 'avoidance' (disengagement) coping. Uy, Foo and Song (2013) found that emotion-focused avoidance strategies can provide benefits via respite.

Common to the above mentioned typologies is their conceptualisation of coping as a present-oriented process. That is, coping strategies are enacted in response to immediate stressors.

Coping as a Time-oriented Process

Future-oriented or anticipatory coping refers to a proactive method of goal and risk management enacted in anticipation of actual or potential stressors (Greenglass, 2002). Future-

oriented coping comprises two future-directed coping sub-types (Greenglass, Schwarzer, Jakubiec, Fiksenbaum & Taubert, 1999): 'preventative coping', and 'proactive coping'.

Preventative coping is defined as "effort to build up general resistance resources that reduce the severity of the consequences of stress, should it occur, and lessen the likelihood of the onset of stressful events in the first place" (Greenglass, 2002 p.6).

Proactive coping is conceptualised as a self-regulatory, positively-oriented method of goal attainment (Greenglass, 2002; Sohl & Moyer, 2009) and is defined as "effort to build up general resources that facilitate promotion toward challenging goals and personal growth" (Schwarzer & Taubert, 2002 p.9). Proactive coping occurs *before* the presence of an identified stressor (Carver & Connor-Smith, 2010).

There is evidence that some entrepreneurs use anticipatory coping responses. For example, Egan and Tosanguan (2004) found that entrepreneurs utilised proactive strategies when dealing with economic recession (e.g. accumulating financial reserves in anticipation of future need). Of the entrepreneurs who participated in their study, approximately half used such strategies. Furthermore, Jenkins (2012) reported that entrepreneurs use 'planful problem solving' (i.e. coping in anticipation of an identified stressor appraised as a threat – preventative coping) when facing venture failure.

Cope (2011) appears to recognise the need for temporal dimensions when investigating the stress-strain relationship in entrepreneurs. His interpretative phenomenological analysis, which focused on learning from failure, is one of the few qualitative studies of coping in entrepreneurs. Cope found that 'looking ahead' after firm failure was an important step for entrepreneurs and a more adaptive strategy than reflecting on the past. Cope's findings suggested that entrepreneurs who are future-oriented experience lower levels of strain as a result of firm failure.

The temporal nature of coping in entrepreneurs is further highlighted by Shepherd's (2003) work on 'restoration orientation' which refers to a period of time spent 'looking forward' and not back after encountering the stressor of venture failure. Shepherd appears to suggest that for adaptive outcomes, entrepreneurs should cope with the immediate stressor by using reactive coping while simultaneously enacting anticipatory coping strategies to deal with secondary sources of stress. Taken in tandem, prior research indicates that investigating reactive *and* anticipatory coping may help shed light on the effectiveness of coping responses in entrepreneurs.

Bird and West (1997, pp. 5-6), advocated for temporal dynamics to be placed at the epicentre of entrepreneurship, noting that "[Entrepreneur's] characteristics and competencies derived from their personal histories – including temporal orientation (past, present, or future) and future time perspective… are critical variables that enter into the formula for successful entrepreneurship".

Summary and Conclusion

In this paper, we reviewed the emergent literature on stress and coping in entrepreneurs to evaluate the application of coping typologies to coping responses among entrepreneurs. Based on this review, we posit that traditionally-adopted coping typologies that focus on the function of coping responses (e.g. task- or emotion-oriented) may not adequately differentiate effective and ineffective coping responses in entrepreneurs.

Given that entrepreneurs are attributed with future-oriented (i.e. temporal) traits (Bluedorn & Martin, 2008; Przepiorka, 2015), and that personality traits may influence coping strategy selection, we urge scholars to adopt a wider temporal lens through which to investigate coping responses in entrepreneurs by examining the effects of both functional and temporal dimensions of coping. Further research could investigate interactions between personality traits and coping strategies and implications for strain in entrepreneurs.

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A STUDY OF THE RELATIONSHIPS AMONG PERCEIVED SERVICE INNOVATION, FLOW EXPERIENCE AND REPURCHASE INTENTION

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Abstract

This study is to investigate the relation among perceived service innovation, flow experience and repurchase intention and to validate if flow experience has mediation effect on service innovation and repurchase intention. The objects of this study were online shopping customers in Taiwan. 330questionnaires were released and 300 valid ones were retaken. The effective response rate is 91 %. The research methods include descriptive statistics analysis, reliability and validity analysis, and correlation analysis. The results of the study are as followings. First, the online shoppers' perceived

service innovation has positive influence on repurchase intention. Second, the online shoppers' perceived service innovation has positive influence on flow experience. Third, the online shoppers' flow experience has positive influence on repurchase intention. Fourth, the online shoppers' flow experience has the mediation effect between service innovation and repurchase intention.

Keywords: online shopping; service innovation; flow experience; repurchase intention

Introduction

Because of the rapid development of the Internet, many people take care of their daily needs through the Internet, such as playing online games, looking for information and doing online shopping, and shopping is people's daily necessary behavior. Before the development of the Internet, many consumers go to the store to buy things in person. With the rapid development of the Internet function and virtual stores, many consumers don't have to buy things in the physical store; instead, they can do that just through the Internet. Compared with the physical retail store, the online store has another priority which can help people to save much time, so when people have to shop, they prefer to buy things on the Internet because they have different kinds of products to choose from just through the computer. Therefore, it is obviously important for the researcher to explore the related factors of online shopping.

Repurchase intention which all the bosses care about most means that consumers feel like buying the same products again or going to the same place to buy things again. Kotler (2003) pointed out that it costs five more times to open new buyers than to maintain the original ones. In marketing graduate school, the researchers always focus on repurchase intention and try to find out the related factors. However, there were already many researches about the factors of repurchase intention. There are perceived value (William & Hu, 2003) , customer loyalty, satisfaction (Michael, 2007; Michael, 2003; Curtis, Abratt, Rhoades, & Dion, 2011). Repurchase intention is important for both physical retail stores and online stores. Though there were many researches about online shopping including online shopping safety and operating problems (Delafrooz, Paim, & Khatibi, 2011) and the factors of the successful online marketing (Huarng, Yu, & Chang, 2008). But the research about the repurchase

intention of the online shopping has been neglected obviously.

Online shopping is a part of the Internet usage, and flow experience is an important issue for online users. Nowadays there are many researches about this topic; however, some of them focus on online games players (Chou, & Ting, 2003; Namin, 2006) , and some focus on online surfers (Dahui, & Glenn, 2006; Huang, Chiu, Sung & Farn, 2011) , and some researchers even think flow experience of online usage as a status of addiction (Chou, & Ting, 2003). Chen, Wigand and Nilan (1999) indicated that almost 40% of online users had achieved the state of flow. Once online users flow experience symptoms, they are willing to spend more time using Internet applications (Van der Heijden H, 2003) and increase their loyalty to e-tailers (Choi, & Kim, 2004; Koufairs, 2002). Therefore, flow experience is an important and common status which happens all the time to the Internet users and this wonderful status will affect the factors of other activities including the effect of the Internet users' flow experience on repurchase intention.

Innovation capability has become a critical component of a firm's marketing capability if it intends to maintain its long-term performance (Atuahene-Gima 1996). To compete in the marketplace and sustain a competitive advantage, service providers need to maintain ongoing innovation (Cromer, 2010; Droege, Hildebrand, & Forcada, 2009). Yang, Yang and chen (2014) indicated that the audit firms provide different services to satisfy clients' demands and thereby adopt different business strategies. From the above points of view, the motivation of this study focuses on consumers' repurchase intention not only at physical retail stores but also at the stores on the Internet. The researcher would like to explore the relation among the repurchase intention, flow experience and service innovation based on the two factors, the consumers' website surfing and the feeling of online shopping.

Literature Review

The relation between service innovation and repurchase intention

Service innovation means that consumers get the service which is different from what he thought before (Gadrey, Gallouj, & Weinstein, 1995). Zeithaml and Bitner (2000) think the process of service innovation is similar to the product innovation, but the quality of service is different from that of the products.

Gilkeson and Reynolds (2003) think that the evaluations from sellers and buyers are the credit of the stores and consumers' shopping experience, which helps other potential consumers or other interested ones understand the service innovation, trustworthiness, satisfaction and the product quality through the evaluation of the stores. Therefore, when consumers want to buy things on the Internet, they think not only their own previous shopping experience but also other consumers' evaluation of the service innovation and product quality at the store to judge the value of the products and to decide if they will buy it or not. Thus, it is known that consumers' service innovation and the product quality will affect consumers' repurchase intention deeply.

Kim, Ferrin and Rao (2009) think that repurchase consumer and buyers for the first time have one thing in common --- surfing the stores online according to their needs. However, they are different because repurchase consumers are already affected by their own experience and they also trust and know the stores that they chose before. Thus, the consumers' service innovation may decide what products they will buy and if they will buy at the same store again. Liu, Yang, Wei and Chen (2009) collected the business deal data from the biggest shopping Website-Taobao in China. The repurchase percentage of the business deal is 24.3. The consumers' repurchase shows their high recognition to Taobao. Reicheld and Schefter (2000) think that focusing on the right consumers is the key point to gain profit. The original consumers have chance to become loyal consumers and they not only have the repurchase action but also advertise for the seller for free. Therefore, consumers' ups and downs of perceived service innovation will affect consumers' repurchase intention. The hypothesis of this research is as the following.

H1. There is positive relationship between online shoppers' perceived service innovation and repurchase intention.

The relation between service innovation and flow experience

Chen et al (1999) find that it is easy to have flow experience for consumers when they use the Internet and it is found that from the result of the flow experience, the environment of the Internet usage can cause pleased experience and obviously change the life satisfaction and personal subjective consciousness. The online stores uses all kinds of innovation methods and all new service in order to build different Internet environment, attract consum-

ers' attention, and expect that consumers can have wonderful flow experience. Massimini and Carli (1998) point that flow experience can be produced by adjusting psychological factors and designing external situation. For example, the stores on the Website attract consumers' recognition and cause their pleased flow experience. According to Oke's (2007) research, service innovation is produced during the process of the service and that is, when selling products or service, new innovation and devotion are produced to the consumers. The researcher will study and discuss more in order to attract consumers' attention. Thus, this study infers if consumers' ups and downs of the perceived service innovation will affect consumers' flow experience. The hypothesis of this study is consumers' innovation service has positive influence on flow experience.

H2. Online consumers' perceived service innovation has obvious positive influence on flow experience.

The relation between flow experience and repurchase intention

When people concentrate on one activity and reach the flow state, they can forget their worries and gain much joy, which is called an optimal experience. People with flow experience often concentrate on what they do and their concentration will reach such an intensive state that they can't notice anything except what they do. Thus, they don't pay attention to other things which has nothing to do with what they do, and their worries will also disappear (Csikszentmihalyi, 1982). Trevino and Webster (1992) think that flow experience creates a very subjective exploratory and playful interaction between people and machine. Flow experience is a kind of self-arousing experience because it is the pleasure produced by someone when he/she does an activity and that pleasure will make him/her do the same it again. That is the same as the flow experience which when people do online shopping can also cause the repurchase intention. Webster, Trevino and Ryan (1993) think flow experience is a kind of interactive experience between people and machine. It has the playful and exploratory characteristic. During the interaction, people can feel pleased and involved with the subjective feeling. Consumers can get positive emotion and satisfaction in various kinds of online shopping and cause further personal exploration. Kolter (2000) pointed that after consumers purchased or got the service, they would have the repurchase intention if they got the satisfactory feeling. Therefore, this study infers that the ups and downs' of the

consumers' flow experience will affect consumers' repurchase intention. Therefore, the hypothesis of this study is as following.

H3. Online consumers' flow experience has positive influence on repurchase intention.

The relation among service innovation, flow experience, and repurchase intention

Kim and Mauborgne (2004) raising that blue sea strategy --- creating new market advocated a company to create its own value innovation with the blue sea strategy and occupy the new market by running this victorious strategy. In the blue sea strategy, there are four action programs including reducing and vanishing action to save cost and expand needs. On the contrary, the aims of reaching differentiation and new value products are received by promotion and creation to avoid the traditional bad price war--- the red sea market. Thus, under such competitive environment, online stores have to try hard to adjust to gain the consumers' recognition in order to cause their repurchase intention. Gefen and Straub (1997) said that when the consumers are familiar with online stores or are knowledge-based about the stores, they will trust the Website and then they will shop on the Website with their Internet purchase intention. Thus, it is important how the online shopping can attract the customer to surf the Net. Fashionable and creative Website which offers service is the most attractive. Dawson, Block and Rideway (1990) expressed that consumers with experience and strong motivation will have more pleasant incentive and satisfactory flow experience. Kolter (2000) pointed that after consumers finished shopping and got served, their satisfied or unsatisfied feeling will affect their purchase intention. In other words, if they feel satisfied, they will have repurchase intention. Therefore, this study tries to explore the relation between consumers' repurchase intention with the flow experience as the intermediate variable.

H4: Online shoppers' perceived flow experience as intermediate variable between service innovation and repurchase intention.

Methods

The Research Structure

This study explored the relation among the consumers' perceived service innovation, flow experience, and repurchase intention based on the data of the researches from all over the world with the service innovation as the

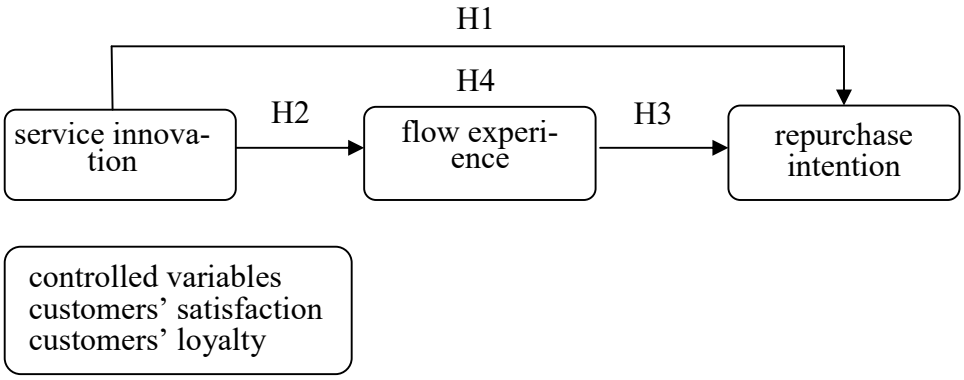

Figure1. Research Structure

independent variable, repurchase intention as the dependent variable, the flow experience as the intermediate variable and the consumers' satisfaction and loyalty as the controlled variable.

Sample

The objects of this study are online consumers. Online consumers are a hidden group, so it is hard to estimate the population characteristic with the standard sampling method. Besides, the researcher adopted convenience sampling method to release questionnaires under the consideration of cost and time. Convenience sampling is an unlimited method and the researcher can choose the objects freely because it accords with the economic efficiency and it is easy to carry out. The researcher collected data through paper questionnaires which were released to the people, their family and friends with online shopping experience to collect more data.

The method of this study to collect data is releasing distributing questionnaires mainly to the online shoppers. There are 330 questionnaires and the retaken ones are 330. The response rate is 100. However, there are 30 invalid ones and 300 valid ones, so the effective response rate is 91.

Measures

Service innovation

Chen and Krumviede (2012) thought that service innovation is the new innovation---the change of the service item innovation and the gradual progress innovation. They developed six innovation scales based on the opinion.

The study examined the perceived service innovation of the online shoppers and scored them with Likert 7-point scale. The questions are for example. (1) The services were modification of an existing company service and (2) The services were revision of an existing company service.

Flow experience

Skadberg and Kimmel (2004) pointed that when surfers have flow experience of being confused about time and enjoying the process, it is mainly because of the abundant design of the Website content attracting surfers to surf the Website so often and they could enjoy the feeling of concentration. Then the flow experience scale of Website surfing was developed and there were three scales as followings. (1) While I was browsing the Web pages, time seemed to go by very quickly. (2) While browsing this Web site, I was not aware of my immediate surroundings. (3) I felt that I was in the world created by the Web site–the Texas Coastal Birding Trail.

Repurchase intention

The test of the repurchase intention is mainly based on Bhattacherjee's (2001) repurchase intention of online banking division (OBD) and there are three scales. The first two scales adopted from Mathieson's (1991) behavioral intention (to accept information systems) scale. They are as followings. (1) I intend to continue using OBD rather than discontinue its use. (2) My intentions are to continue using OBD than use any alternative means (traditional banking). The third item assessed respondents' overall discontinuance intention (worded negatively to control for potential common-method bias). The content of the question is as following. If I could, I would like to discontinue my use of OBD (reverse coded). The original scale mainly explored the consumers' repurchase intention of the online banking don (OBD). Though it is similar to this study, they are not entirely the same. Thus, in order to meet this study's need, the researcher modified the item of the scale to test those online shoppers' repurchase intention and scored them with the liker's 7-point scale. The questions are as followings. (1) I intend to continue using purchase website rather than discontinue its use. (2) My intentions are to continue using purchase website than use any alternative means. (3) If I could, I would like to discontinue my use of purchase website.

Control variables

From the past literature, the influence of consumers' perceived satisfaction and loyalty on purchase intention was explored many times in many study fields. Thus, in this study customers' satisfaction and loyalty are chosen as controlled variables.

Consumers' Satisfaction

The measurement of consumers' satisfaction mainly focused on Bhattacherjee's (2001) research about consumers' repurchase scale of online banking division and there are three questions. Bhattacherjee's (2001) consumers' satisfaction of OBD was adopted to survey consumers' satisfaction and there are four questions. The Likers 7-point scale is adopted to score it and the questions are as followings. (1) Very satisfied. (2) Very pleased. (3) Very contented. (4) Absolutely delighted.

Consumers' Loyalty

Anderson and Srinivasan's (2003) consumers' loyalty of the online user scale was chosen to determine it. There were 7 questions in total and Likert 7-point scale is used to score it. The questions are as followings. (1) Very satisfied. (2) Very pleased. (3) Very contented. (4) Absolutely delighted.

Data Analysis

In order to validate the hypothesis of the study, the data analysis methods of this study include narrative statistics analysis, confirmatory factor analysis, reliability analysis, validity analysis, relevance analysis, and multilevel linear analysis. Also SPSS and AMOS software are used to analyze the data.

Results

Table 1. provides the descriptive statistics, correlations and scale reliabilities for the study variables. As shown in the table, the study variables all possess an acceptable degree of internal consistency reliability and there are significant correlation between all variables ($r = 0.485 – 0.648$, all $ps < 0.01$). The standard deviation of each variable is above 0.99

In model 2 of Table 2 is regression analysis between service innovation and repurchase intention. The result is that service innovation has obvious positive influence on repurchase intention ($\beta = .32$, $p < .001$) Thus, the hypothesis H1 is supported and that is service

Table 1. Descriptive statistics, correlation and reliability

	Mean	SD	α	1	2	3	4
1.Service innovation	5.16	1.06	.843	1			
2. Flow experience	4.68	1.41	.725	.486**	1		
3. Repurchase Intention	5.25	1.10	.600	.573**	.486**	1	
4.Customer Satisfaction	5.15	0.99	.875	.584**	.506**	.564**	1
5. Customer Loyalty	5.02	1.14	.875	.495**	.485**	.551**	.648**

service innovation has obvious positive influence on flow experience. ($\beta = .25$, $p < .001$) Thus, hypothesis H2 is supported. In other words, service innovation has obvious positive relation with flow experience. It is also shown that the higher the recognition of online shopping is, the higher flow experience is.

In model 4 of table 2 is regression analysis between flow experience and repurchase intention ($\beta = .21$, $p < .001$). The result is that flow experience has obvious relation with repurchase intention. It is also shown that the higher the flow experience is, the higher the repurchase intention is.

In model 5 of table 2 is interactive analysis among flow experience, service experience, service innovation, and repurchase intention. The result is that flow experience ($\beta = .29$, $p < .001$) added by service innovation but it is less obvious. That is, there is interactive effect between service innovation and repurchase intention. So the hypothesis H4 is supported.

Discussion and Conclusion

According to the question and goal of the study, the researcher collected much relevant resources and built the hypothesis. With the process of collecting data, empirical analysis, and hypothesis exanimation, the conclusion of the study was got and practical application and academic research was raised. Finally, the limitation and suggestions of this study were also presented and offered to those who may want to study about this topic in the future.

In this study, the flow experience was used as intermediate variable be-

tween customers' perceived service innovation and repurchase intention to explore if customers' perceived service innovation has influence on repurchase intention. According to the examination in this study, it has obvious positive influence on repurchase intention. Flow experience has intermediate effect between customers' perceived service innovation and repurchase intention. Customers' perceived service innovation and flow experience both have influence on customers' repurchase intention. Based on this, some practical suggestions are raised in this section. CEO Mr. Stan Shih in Acer thinks that there are chances of innovation everywhere---not only the management models, products, marketing, and technology but also

Table 2. The Regression Analysis of Service Innovation on Repurchase Intention

	Repurchase Intention		Flow experience	Repurchase Intention	
	Model 1	Model 2	Model 3	Model 4	Model5
Customer satisfaction	.357***	.210**	.22**	.29***	.12**
Customer loyalty	.320***	.254***	.22**	.26***	.22***
Service innovation		.324***	.25***		.29***
Flow experience				.21***	.15**
R^2	.373	.444	.34	.404	.45
ΔR^2		.071		.066	.05
F 值	90.01***	78.85***	50.49***	68.46***	62.56***
VIF	1.73	1.57~2.05	1.57~2.05	1.4~1.8	1.51~2.12

Note 1. **stands for $p < .01$; ***stands for $p < .001$

2. Each variable's VIF is less than 10 and that means there is no collinear problem between them.

the supply chain and different thinking ways of service.

According to Delafrooz, Paim, and Khatibi's (2011) customers' online shopping behavior, they would like to

shop on the Website when they feel safe to do it or the online stores are trustworthy; on the other hand , the process of online shopping should be easy to operate. The wise search engine and competitive product price can attract customers to surf the Internet and buy things online. Because of this, not only exploiting good product quality management but also providing safe online shopping environment and various service innovation can raise customers' repurchase intention positively.

Webster, Trevino and Ryan's (1993) flow experience is a very subjective interaction between people and machines. It has playful and exploratory quality. During the interaction, he/she can feel pleasured and get involved it. There are many kinds of online shopping. Consumers can get more positive emotion and satisfaction and then go further personal exploration. Smart cell phones become an access to electronic business. It is an important issue for the boss of the online stores to establish good operation interface, ways of payment and service innovation of smart cell phones under the competitive online shopping environment. The online traders have to meet different customers' needs and cause their mental recognition. If customers feel satisfied, it is more possible for them to buy things again.

Limitation and Future Research

Though the researcher had already tried his/her best to do the research, there were still limits and shortcomings because of the time, man power, and resource limits. Therefore, the limits and suggestions were raised and provided as references for other researchers. The cross sectional analysis was adopted in this study, so the collected data could only be used to understand the customers' opinion of online shopping, but the time influence was not able to be explored. Thus, there were limits when inferring the conclusion because this study only focused on the online customers and had them do the unit test. There were no ways to do the double sources and vertical section analysis and comparison, so no other outcomes could be got.

In a word, it is confirmed that the stronger the service innovation is, the higher possibility of repurchase intention will be. The higher the consumers' perceived service innovation is, the higher the flow experience will be. The higher the flow experience is, the higher the repurchase intention will be. The degree of customers' perceived service innovation and repurchase intention will be influenced positively by flow experience. Therefore, it is meaningful to examine the relation between the cause

and effect. According to the examination analysis, there are suggestions offering to the follow-up researchers.

The objects of this study focused on the online shoppers, and the questionnaires of this study were released to those who live in the northern of Taiwan. In order to make the result of the study more typical and standard, it is suggested that the research objects can also include the consumers around Taiwan.

In this study, only the personal online shoppers were explored. However, because of the Website virtual social group, both gathering more people and taking advantage of negotiating price online can get a good bargain. Group purchase on Website is more and more popular for Internet users, so it is suggested that the follow-up researchers can focus on the group purchase consumers on the Internet in the future.

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International Journal of Organizational Innovation

EVALUATION OF THE X, INC. ORGANIZATION: ARE LARGE MULTINATIONALS IMMUNE TO LEADERSHIP DISEASES, VIRUSES, AND OTHER ILLNESSES?

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Abstract

This article evaluates the X, Inc. organization for leadership diseases. It focuses on the Abilene Paradox, double talk, pseudo work, and diseases identified by W. Edwards Deming. To overcome the issues X, Inc., a large multinational, faces, the organization should recognize root problems, and should apply organizational solutions. The organization should divert its attention from bad management practices identified to focus on improvement and innovation in the services it provides all over the world.

Key Words: Organizational Diseases, Abilene Paradox, Double Talk, Pseudo Work

Introduction

Organizations behave differently in their day-to-day operations. Some behaviors in organizations have positive effect while others negative. Below is a list of patterns one of the authors recognized while working in X, Inc., a large multinational organization that operates in many parts of the world.

Harvey's Cheating / Cooperation

Harvey (1988, 1999) defined cheating as giving or receiving aid, or collaboration. Failure to assist others leads to many problems. X, Inc. collaborates and helps and supports each other, but only at the lower organizational levels. This collaboration and team work is required. Since one employee's work has direct or indirect

effect on the success of the department as a whole.

The upper and middle management, regretfully. Does not seem to collaborate. The environment created by the company and the upper management does not encourage collaboration and team work, rather they give priority to rewarding individual achievement.

Abilene Paradox

Harvey described the Abilene Paradox in 1988. He defines it as the inability manage agreement. Some of the reasons behind falling into Abilene are fear of getting fired, fear of reputation, eagerness to be a team player, fear of dislike by colleagues, wanting to be social, fear of challenging the acceptable course of actions, to go with the flow, etc. Falling into Abilene compounds company's problems instead of solving them.

X, Inc. goes to Abilene often, especially during meetings. A good example is when my colleagues and I went into Abilene when we were told we had to clean the break room area by our manager. We all didn't disagree on the matter; however, thinking that everyone agreed in taking this responsibility, we consented in silence.

We eventually came to understand that everyone did in fact disagree with the decision when one of our colleagues came from vacation and refused to do the task. He went and discussed the matter with our manager and this gave everyone the courage to speak up and disagree.

Another example is company's new requirement that employees should wear uniforms. Everyone went along with the decision, but later led to a lot of problems and conflicts. Some employees were complying and were wearing uniforms, while others did not.

To prevent non-compliance, top management started punishing employees. This whole matter ultimately became an issue reaching the CEO's office. If everyone who disagreed with the idea said something at the time, this issue possibly could have been prevented.

Double Talk

Double-talk is a lie with a malicious intention to hide the truth. It intentionally creates confusion and makes everything vague. Ivanov (2017) argues that double-talk destroys work.

X, Inc. uses doubletalk to manipulate and to hide information from its employees. The CEO of X, Inc. manipulates the staff, and when the truth is uncovered later on, the staff ends up losing trust in the organization. The loss of trust further led to *pseudo work*. Ivanov (2017) explains pseudo work as pretend work or farce, that gives the appearance of work, but in fact it is not work. A person doing pseudo work is going to be less excited and motivated to improve or create change to the organization.

Pseudo Work

Work is the phenomenon that occurs between two or more people,

as defined by Ivanov (2017). Work is the essence of all human beings (Ivanov, 2017). Real work is a positive experience that needs truthful exchange of information (Ivanov, 2017). Ivanov claims that pseudo-work gives a negative experience. Real work, Ivanov continues, on opposite, provides for a positive experience, and makes you dedicate yourself to the work. Real work requires time, long-term planning, structure, discipline, faith, commitment, involvement of a lot of people, and belief that something good would came out at the end. Real work is an opposite experience from Harvey's Abilene Paradox, and Orwell's double talk.

Ivanov further describes pseudo-work, in which individuals who engage in this activity, put minimum effort in the job and lack pride in what they do. They are also not emotionally invested. They receive a negative experience since they have negative emotions, little or no trust. They lack faith, structure, discipline, energy and motivation for their work. This eventually leads to stagnation. Pseudo work will lead to an increase in the organization's deadly disease and obstacles that Deming accurately described (1992, 1993, 1994).

At X, Inc. employees put minimal effort and motivation towards work. Employees usually wait for the upper management to order us to do something, and what to do next.

Employees show little creativity and productivity. Many were just doing the work to just get paid and gain experience. Doing the work, employees feel wasting time for money. This indicates that X, In.c is engaged in pseudo-work, destroying the organization and its workforce.

Deming's Deadly Diseases

W. Edwards Deming described various management diseases (1002, 1993, 1994). We applied Deming's analysis to further evaluate X, Inc. for the presence of these illnesses.

Constancy of Purpose

This is the deadliest management disease as described by Deming. Organizations get infected with this disease when they stay stagnant for years without innovation, and improvement in the existing products and services.

X, Inc. is affected with this disease because it lacks innovation and improvement of its services. During my time at X, Inc., there were no new services developed by the organization, and no improvements were thought or made on the existing services. To gain new customers, the X, Inc. must constantly develop new services and improve the existing services, which X, Inc.'s did not undertake.

Performance Evaluations

This disease type is controversial because many HR professionals argue that performance evaluation helps the organization. The authors believe this disease is deadly, as Deming (1992, 1993, 1994) accurately demonstrated. Deming calculated that upper management has control of 96% where the remaining 4%

is in control of the employee. Ivanov (2015, 2017) argues that the employees have less than 1% of system control, whereas the remaining 99% is under the control of upper management.

X, Inc. uses annual performance evaluations that are destroying the company. This method of ranking is making the staffs to be less collaborative with each other. The organization should instead divert its focus on quality and technology improvement and innovation. The employees should work in collaboration rather than compete with one another for a rank. This particular disease has led to significant reduction in teamwork and collaboration. This is one of the main reasons contributing also to organizational pseudo-work.

Management by Quotas

X, Inc. has a sales plan every quarter and to achieve this sales goal, the management will overload and pressure everyone. They also order to work extra shifts. Management by quotas has led an increase in mistakes and errors. X, Inc. does not even realize it has this disease costing the company's profits. The organization should give more priority to quality instead of focusing on quotas.

Recommendations

Top and middle management should work together as a team. The organization should avoid going to Abilene by creating open lines of communication among its employees at all levels. This may increase trust and the culture of speaking up about their disagreement or opinions. Additionally, open lines of communication could remove communication barriers, and can further motivate employees in applying their skills and knowledge, which would eventually lead employees to do real work.

The company's top and middle management should work to innovate and improve new and existing services. The organization should abolish employee grading and evaluation system, and instead focus on innovation and creativity. X, Inc. should give priority to the high-quality service and safety instead of fixating themselves in meaningless quotas. X, Inc. should acknowledge that this disease causes stress, pressure, errors, and mistakes. The company should find a way to motivate and inspire employees to do real work. X, Inc. should test its organization regularly to determine if the organization is becoming sicker or healthier. The managers should avoid double talk when communicating with employees, and should recognize Deming diseases to find to cure the organization.

Conclusion

X, Inc. faces multiple organizational issues, such as lack of collaboration, double talk, Abilene, and engagement in pseudo work. Deming's deadly diseases are also present. X, Inc. should acknowledge the issues, and try to find ways to treat these diseases in order to achieve its missions, vision, and win its future.

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A STUDY OF CONSTRUCTION COMPANIES' ORGANIZATIONAL EFFICIENCY PERFORMANCE MEASUREMENT MODEL

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Abstract

In an age valuing competitiveness, artificial neural network is widely used to construct measurement model of organizational efficiency in every industry or trade. The researcher uses artificial neural network as measurement model of construction companies' organizational efficiency. After summarizing references and interviews with construction executives of five listed or OTC listed companies of more than ten years old, the researcher concludes that organizational efficiency of construction companies is classified into five categories and 17 variables and develops 17 measurement items. For this research, 200 questionnaires have been handed out and 195 questionnaires have been collected. The 135 effective samples include 105 learning samples and 30 prediction samples. Through traditional backpropagation artificial neural network simulation and that of variable learning efficiency, it is found that organizational efficiency of construction companies should be classified into four categories, namely, background of organizational structure; flexibility, rules and regulations of organizations; adaptation process of personnel; and methods and objectives of organizational strategy. It is also found that backpropagation artificial neural network of variable learning speed is an excellent prediction tool for organizational efficiency construction applied in this research if over fitness can be avoided.

Key Words: artificial intelligence, organizational efficiency, construction executives, traditional backpropagation artificial neural network

Background And Motives Of Research

The 21st century is an age with fierce industrial and commercial competition. Low cost, high quality and high efficiency are always valued in every industry or trade. As for products, quality control, total quality management and conformance to requirements of ISO all aim at the so called "competitiveness". Market demand and supply will also change as external environment changes. Technologies and knowledge provided by the former products or services inside enterprises will be tested by trend. According to development trace theory of S curve, it is found that enterprises formerly devoted to product improvement may undergo aggressive technological change so that the former products are fully replaced and the ability and endowment the former products rely upon for existence will weaken. Consequently, leaders in an industry may become losers but startup new enterprises may quickly become leaders of an industry (Afuah, 1997; Foster, 1986; Khalil, 2000).

Speed, efficiency and performance are basic conditions for survival of enterprises. Besides, diversification of the society requires workers engaged in every industry or trade to value quality and competitiveness. Namely, properly working is no longer sufficient for survival of enterprises. On the contrary, only enterprises with excellent operation can survive in the environment with increasingly fierce global market competition. With many consumption choices, consumers will obviously first consider and seek products or services which can satisfy their demand. In order to obtain desirable profitability, enterprises must deeply know about and satisfy demands of the target customers and work better than their competitors. By observing growth and decline of domestic construction industry, the researcher finds this industry is the mostly influenced by business cycle factors and related overall environment factors.

The recent worldwide financial storm has swept across the globe and caused negative growth pressure to economy and will inevitably greatly impact the construction industry of Taiwan. With economic decline, the government has carried out multiple economic revitalization plans. However, economy hasn't showed signs of improvement. The main reason is that not only has private investment in industries sharply declined but

also many factories are shut down and operation scale is commonly reduced so that unemployed people constantly increase. Traditional construction industry is the first to bear the brunt and it is difficult for it to take a favorable turn within a short period.

For a long term period, the whole construction industry will still be mired in the difficulty of bleak business if efficient reform is not carried out. Vicious 40 cycle will form and recession will follow in case of irrational fierce horizontal competition. Affected by worldwide financial storm, the construction industry must comprehensively enhance its competitiveness in order to operate perpetually. It is no longer enough to only pay attention to technical aspects of new technologies and tools. It is necessary to carry out thorough reform and analysis with respect to organizational efficiency in administrative and technological management aspects. All operation plans of construction companies have short term and Long term objectives.

Thus many factors will influence organizational efficiency. The researcher will collect information from references and interviews with five listed or OTC listed construction companies of more than ten years old. After summarizing such information, the researcher uses artificial neural network to construct measurement model of organizational efficiency. This research aims at carrying out self evaluation of construction companies and enhancing their competitiveness. (Objectives may be further described).

Discussion of Literature

Whether construction companies are competitive and whether their organization is efficient will be very important indexes. Main considerations for perpetual operation of enterprises include proposals of many scholars and experts, such as total quality management, organization reengineering and conformance to ISO standards, and also include other management strategies. They are no longer technology based. Therefore, Robbins (Robbins, 1990) defines organizational efficiency as the extent to which an organization realizes its short term and long term objectives, response of selection strategy supporters, evaluators' own interests and organizational life steps. The so called organization plan proposed by Nadler et al. in 1992 is an obvious management tool.

They propose that two important patterns emphasized by organizational efficiency are appropriate interior and exterior.

According to traditional response method of Miller and Fresien (1984), it is found that organizations must change their internal attribute structure, strategy and process in order to respond to environmental transformation. Hitt (1988) believes measurement of organizational efficiency and its importance lie in creation and design. Organizational efficiency of constructions is mainly determined by organizational structure, strategy and culture (Adas, 1996). These factors greatly influence adaptability of construction industry environment.

Four modes of competition value: (1) Reasonable objective mode emphasizes control and organization focuses, methods set by plan and objectives as well as advantage efficiency value with such considerations as productivity and efficiency;
(2) open system mode emphasizes flexibility and organization focuses as well as advantage efficiency value with such considerations as readiness, flexible method application, internal growth and external support;
(3) internal process mode emphasizes control and internal focuses as well as advantage value efficiency with such considerations as method and control of communication process; and
(4) inter personal relationship mode emphasizes flexibility and internal focuses and advantage value efficiency with such considerations as cohesiveness and the method of boosting employees' morale.

Principle of all the four modes emphasizes organizational efficiency and uses organizational efficiency for defining variables and application of network input. Quinn and Rohorbaugh (1983) suggest selecting this method for defining effective mode of organizational efficiency standards of construction companies. The reasons are as follows. First, its four modes have been taken as the representative combining most efficiency criteria by researchers and managers. Secondly, Maloney and Federle (1993) have proved competition value is applicable to construction companies. Sunil K.Sinhal and Robert A. McKim (2000) classify organizational efficiency of construction companies into four categories, namely,
1. background of organizational structure;

2. flexibility, rules and regulations of organizations;
3. adaptation process of personnel; and 4. methods and objectives of organizational strategy.

Fourteen independent variables and dependent variables are developed from the four modes, namely, 1. harmonization of employees; 2. joint responsibility; 3. subcontracting; 4. diversified project management; 5. coordination; 6. information communication; 7. attitude towards reform; 8. familiarity with rules and regulations; 9. compliance with rules; 10. process control; 11. cultural advantage; 12. workers' participation indecision making; 13. planning; and 14. setting of objectives.

In the 1950s, artificial neural network proved all continuous functions could be expressed by a three layer feedback artificial neural network (Kolmogov, 1957). Therefore, artificial neural network can be called a common solution to all learning problems. The principle of general artificial neural network lies in using the method minimizing energy function to seek optimum weight distribution with gradient steepest descent method.

The reason is that networks of this kind have hidden layer structure and can process nonlinear data (Zeng Xianxiong, Huo Guozhen, 2005). Artificial neural network is precisely defined as follows: artificial neural network is a kind of computer system including hardware and software and it can use many connected artificial neurons to simulate biological neural network. Artificial neurons are simple simulation of biological neurons. They collect information from external environment or other artificial neural networks, perform very simple operation and then output the results to external environment or other artificial neural networks (Ye Yicheng, 1994). In civil engineering, artificial neural network has been successfully used as the method of improving construction companies' efficiency. For example, Karunanithi et al. (1994) successfully used artificial neural network (ANN) to predict flow characteristics of complex river system; Adeli and Wu (1998) used legal network to predict construction cost; Sinha and McKim (1997) used artificial neural network to predict rise of construction cost; Flood and Katim (1994) used implementation structure of artificial neural network basic mode to analyze problems; Moselhi et al. (1991) pointed out that artificial neu-

ral network could be used for soil analysis, optimization, solution to project disputes and facts of implementation.

Artificial neural network is a structure simulating human brain. Its advantage mainly lies in that it can carry out beforehand training and constantly adjusts connected weight until predictive value is very close to actual value (Hegazy et al., 1994). An artificial neural network is multiple nodes or units connected by links. Every link has a corresponding digital weight. Weight is an important method for artificial neural network to carry out long term storage. Learning is usually carried out by updating weight (Stuart Russell, Peter Norvig, 2002). Prediction model of artificial neural network development is feed forward training method calculated by backpropagation. Namely, gradient descent is utilized to adjust ANNweight (Rumelhort et al., 1986). Design of artificial neural network model includes two main items, namely, analysis and construction of problems. Analysis of problems is an independent factor confirming problems.

Construction of problems requires sorting out and identification of independent factors and responds to variables. Training quality of artificial neural network is the quantity depending on training data and the way of inputting data into network. 34

Methods Of Measuring Organizational Efficiency

Prediction model of artificial neural network is developed in three steps. First, define categories and related variables of construction companies' organizational efficiency so as to test efficiency. Secondly, research field covers design and implementation; in the construction industry, variables measure organizational efficiency and structure is also a measurement scale; it is also required to collect representative data acquired by construction companies by using self management questionnaire samples. Thirdly, carry out training and collect correct data about use of artificial neural network, such as principal component analysis (PCA), linear regression and correlation of main factors in data group which are obtained by statistical means. It is found in references that organizational efficiency is classified into four categories.

According to results of interviewing construction executives of

five listed or OTC listed construction companies, it is found that they not only have the same perception and opinion but also play an important role in enhancing organizational performance and efficiency. Therefore, organizational efficiency of construction companies is summarized and classified into five categories. Namely, (1) background of organizational structure including variables 1. harmonization of employees, 2. joint responsibility, 3. subcontracting, 4. diversified project management, 5. coordination and 6. information communication; (2) flexibility, rules and regulations of organizations including variables 1. attitude to wards reform, 2. familiarity with rules and regulations, 3. Compliance with rules and 4. process control; (3) adaptation process of personnel including variables 1. cultural advantage, 2. workers' participation in decision making; (4) methods and objectives of organizational strategy including variables 1. planning and 2. setting of objectives; (5) improvement of organizational performance including variables 1. construction period control, 2. cost control and 3. quality improvement.

The researcher collects correct data by means of research field design. After all variables undergo operation and measurement, the researcher constructs different items to score their degree. Except cultural advantage, all variables are scored by Likert 5 point scale, namely, the highest score is five points and the lowest score is one point (Furnham and Gunter, 1993). As for measurement of organization culture, constant method of Maloney and Federle (1993) is used to measure six main aspects of culture and the measurement results can be converted into Likert 5point scale and are compatible with scoring of other variables. Efficiency index of the construction industry is determined by three factors, i.e., construction period, cost and quality. Efficiency is calculated by average percentage of whether construction scheduling is brought for ward or completion is delayed, whether budget cost is increased or decreased, whether any compensation is made and customers' acceptance of specifications, etc. The calculated value falls between "1" and "0". "0" represents no efficiency and "1" represents 100% efficiency. (Tabulate this discovery) Sources of data mainly include interview, observation, investigation and archives but they must meet two basic requirements, namely, data must be reliable and effective.

As for statistical analysis of data, artificial neural network can reach new state through sample learning and knowledge summary. For example, preprocessed data successfully reduces complexity of network architecture. Correlation analysis is mainly used to deal with linear correlation between two groups of measurement data. When variables researched only include one X variable and one Y variable, linear correlation between them is simple correlation (e.g., Pearson product moment correlation). When variables researched include only one Y variable but p X variables, the linear correlation between the p variables and Y variable is multiple correlation. When variables researched include p X variables and q Y variables, the linear correlation between the p X variables and q Y variables is typical correlation (Cheng Binglin, 2005).

Pearson correlation is used to control construction data group and is main predictor observing the six variables as correlation analysis output. Regression analysis is mainly used for explanation and prediction. Its explanation function mainly lies in predicting variables as well as correlation intensity and correlation direction. Prediction function lies in applying regression equation and using known independent variables to predict unknown dependent variables (Cheng Zheng Chang, 2005). The researcher conducts linear regression analysis over the 17 independent variables and dependent variables. Stepwise regression analysis starts with all variables selected. Remove unimportant variables step by step until all variables kept are important ones. It is main predictor observing the eight variables as output of stepwise regression analysis. Combining networks is intended to develop accurate prediction model of construction organizational efficiency. Five continuous networks are combined. Each network represents a stage of completing mode evolution.

Different statistical methods are used to obtain multiple combinations of important prediction and evaluate implementation ability. Test data of network is unknown so error will occur. Such error is called root mean square error (RMSE). Its calculation formula is:

$$RMSE = \sqrt{\sum_{i=1}^{N} \{Y - Y^*\}^2 / N}$$

Y = actual output; Y * = predicted output; N = observed value. It is also required to calculate total time for network weight and implementation.

Total time necessary for implementing one training cycle is (Skapura, 1996):
W = total weight within network; Tf = forward propagation time; Tb= backpropagation time; Tt = conversion function time; Nt = training sample size; Ne = number of repetitions; M = machine operation time.

Data input by it consists of 17 dependent variables. Accordingly, the researcher constructs prediction efficiency of construction organizations and uses five different networks to construct prediction structure of construction companies' efficiency. The first 17 processing elements (PEs) are constructed in input two hidden layer network. Network output is single neuron. This is general network mode (GEN). The second network mode is based on principal component analysis (PCA), including the eight input processing elements, the first hidden layer and four processing elements at the second hidden layer. As for the third mode, network is constructed through regression analysis. Input and output respectively need two hidden layers made up of eight neurons. The third mode is called regression analysis mode (REGR). The fourth mode is correlation analysis mode (CORR) based on correlation analysis results. This mode is made up of six output processing elements and two hidden layers. The fifth mode is constructed by using GEN and PCA. Appropriate number of neurons is selected at hidden layers according to PCA information of construction data.

Therefore, for network construction, 17 processing elements are at hidden layers, with eight processing elements at the first hidden layer and four at the second hidden layer. This mode is called principal component analysis artificial neural network (PCAANN).

Research Methods

(1) Sample questionnaire design

Measurement of this questionnaire originates from the second aspect. The first source is collection and summary of related literature. The second source is in depth interview with construction executives of five listed or OTC listed construction companies. After making summary, referring to the references and making other efforts, the researcher finally concludes organizational efficiency of construction companies is classified into five categories and 17 variables. The researcher then discusses with construction operators

the important points valued at each construction level and has altogether developed 17 measurement items. For background of organizational structure, six items are designed; for flexibility, rules and regulations of organizations, four items are designed; for adaptation process of personnel, two items are designed; for other matters related to improvement of organizational performance, three items are designed. Altogether 17 items are designed.

(2) Sampling process

For this research, samples are collected for questionnaires of construction operators in the north, the mid, the south and the east of Taiwan. It is intended to predict the results according to answers filled in by the construction operators. Therefore, when artificial neural network is constructed through MATLAB 2007a, effective samples are classified into learning samples and prediction samples. For this research, altogether 200 questionnaires have been handed out and 195 questionnaires have been collected in total.

(3) Sampling results, analysis and discussion (It is suggested to make supplement with respect to this subject because it is not sufficient to discuss artificial neural model.)

This research adopts prediction model. Therefore, questionnaires not completely answered are ineffective samples. Altogether, there are 60 ineffective samples and 135 effective samples. The researcher regards 105 of the effective samples as learning samples and 30 of them as prediction samples. Conditions of ceasing model learning include learning times and MSE. For stabilizing the results, steadily set the upper limit at 10,000 times and MSE at zero. Cease the model when it satisfies either condition. Set the initial weight as random weight. As for variable conversion mode, the researcher adopts the answers originally filled in as output value. It is intended to reduce degree of freedom and increase prediction error when 0 + 1 S function is used to convert output value. It is inappropriate for learning speed to be too high or too low. Besides, backpropagation artificial neural network can now provide variable learning speed. When MSE changes greatly, increase learning speed; when MSE changes slightly, reduce learning speed to increase learning efficiency. For the purpose of determining optimum prediction model, the researcher compares which of the two learning methods will produce better learning effect. There is no fixed formula for calculating the

number of neurons. In addition, learning effect and efficiency will be influenced if the neurons are too many or too few.

Therefore, for the purpose of avoiding influences caused by the number of neurons, the researcher sets the number of neurons between 1 and 21 and respectively builds models to compare the results. This research is intended to build a reliable prediction model. Although prediction objectives are answers filled in the questionnaires, the prediction is essentially quantitative prediction. Therefore, the researcher compares the predicted numeric value with actual data and uses GOAL, MSE, mean absolute percentage error (MAPE) to measure error for the purposes of determining accuracy of predictive value and finding out better structure of artificial neural network. As for prediction of possible answers of a single questionnaire informant, the research defines prediction error by difference between predicted value and actual value. Its calculation formula is as follows:

eit = Fit Oit

Where in, eit = prediction error of question t in sample i; Fit = predictive value of question t in sample i; Oit = actual value of question t in sample i. Deviation of predictive value from actual value in this research can be used for reference. Therefore, the researcher uses percentage to show degree of error.

The common indexes include Mean Absolute Percentage Error (MAPE). Its calculation formula is as follows:

$$MAPE_i = \frac{\sum_{i=1}^{n} \frac{|e_{it}|}{O_{it}}}{n}$$

Lewis (1982) believes that MAPE is the most effective evaluation index and formulates related evaluation standards, as shown in Table 1. In addition, the researcher also uses GOAL as one of the comparison standards. This research is intended to predict answers of questionnaire. Using backpropagation artificial neural network to predict results doesn't necessarily produce integer solution but produces status of continuous integer solution. Therefore, the research defines as follows: prediction is correct if the difference between predictive value and actual value is within ±0.5; prediction is correct if predictive value is 3.1 and questionnaire value is 3 and prediction is wrong if predictive value is 3.6. Simulation results of backpropagation artificial neural

network in this research are shown in the following figures. In Figure 1, Figure 2 and Figure 3, GOAL, MAPE and MSE can be found when traditional backpropagation neural network algorithm is applied. When the number of neurons is set between 4 and 18, performance is desirable within the range of Q1 Q4 (MAPE is lower than 0.15 and GOAL is higher than 0.5). When the number of neurons is set at 6, performance is optimum. Its MPAE is lower than 0.1. Performance is not desirable at Q5 but it is within the range of reasonable prediction. In Figure 4, Figure 5 and Figure 6, it can be found that prediction results of backpropagation artificial neural network perform better than those of traditional backpropagation artificial neural network algorithm when variable learning speed algorithm is applied. Its optimum performance only requires four neurons.

When efficiency is pursued, variable learning speed will perform better. The maximum difference between the two algorithms lies in that extreme results may occur when the number of neurons is set at 19. In such event, neither variable learning speed algorithm performs correctly and the performance even falls beyond prediction. On the contrary, MSE increases by more than 50. The researcher concludes over fitness may occur during learning prediction process. If such circumstance is avoided, variable learning speed backpropagation artificial neural network can be deemed as an excellent prediction tool applied in this research.

Conclusion

Through artificial neural network calculus, the research finds that Q5 doesn't perform desirably. Namely, three variables of organizational efficiency improvement status are within reasonable prediction scope but are obviously unimportant. Therefore, organizational efficiency of construction companies is classified into four categories, i.e., flexibility, rules and regulations of organizations; adaptation process of personnel; methods and objectives of organizational strategy. The researcher also finds that variable learning speed backpropagation artificial neural network is an excellent prediction tool applied in this research if over fitness can be avoided. (This part is analysis results and conclusion should put forward with regard to the overall discovery)

Table 1. Evaluation Standards of MAPE

MAPE (%)	Description
<10	Highly accurate prediction
10-20	Excellent prediction
20-50	Reasonable prediction
>50	Inaccurate prediction

Figure 1. MAPE of GDA Algorithm

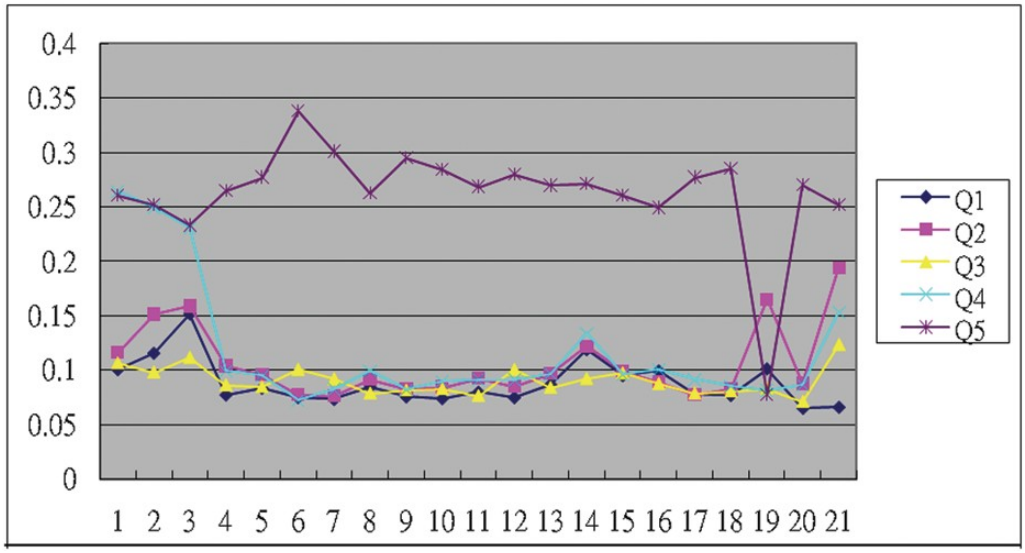


Figure 2. MSE of GDA Algorithm

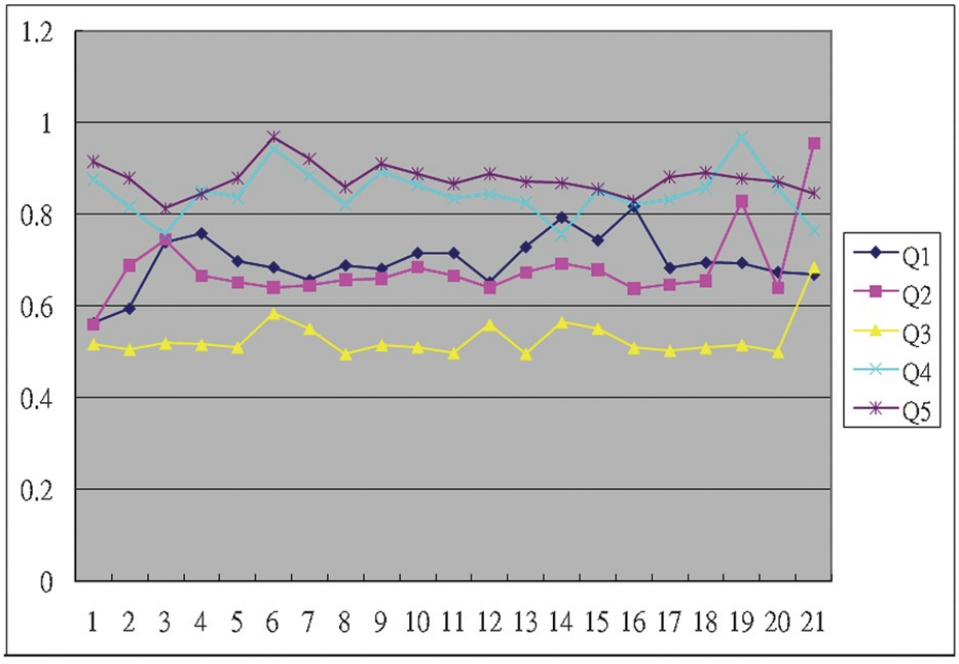


Figure 3. GOAL of GDA

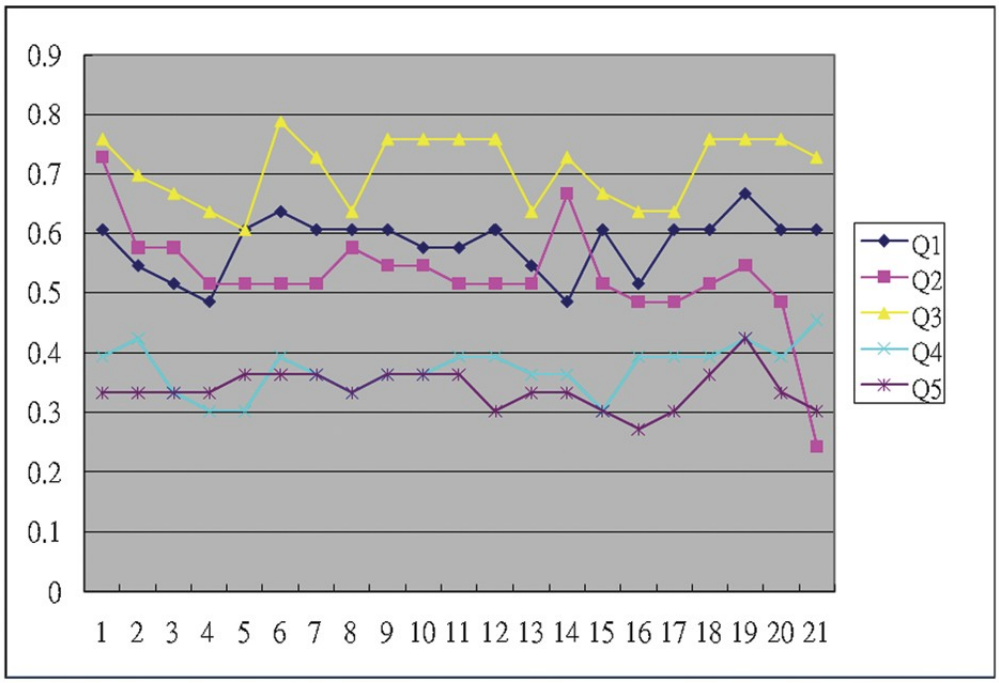


Figure 4. MAPE of GDX

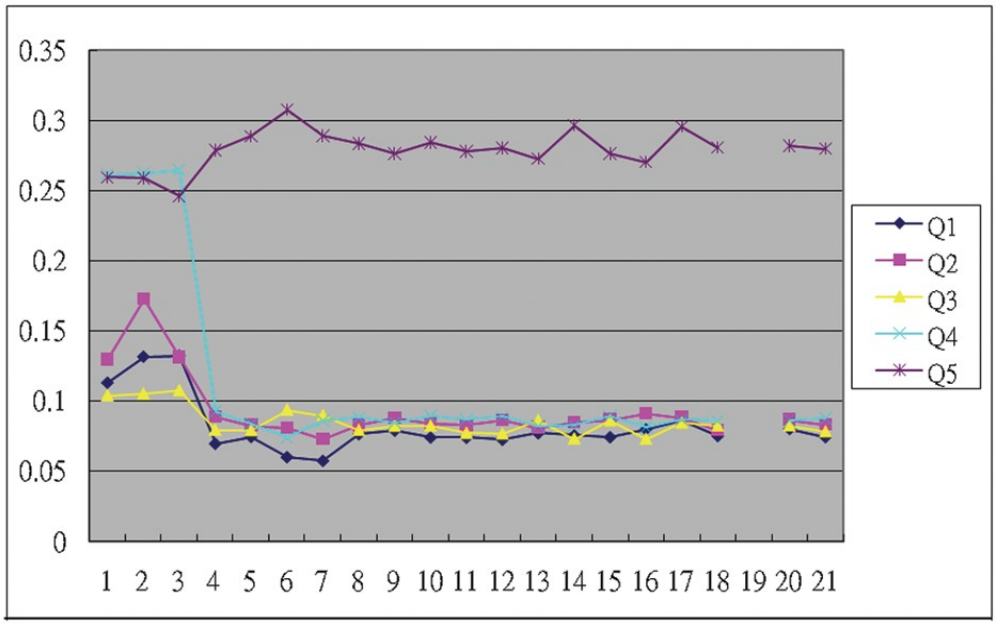


Figure 5. MSE of GDX

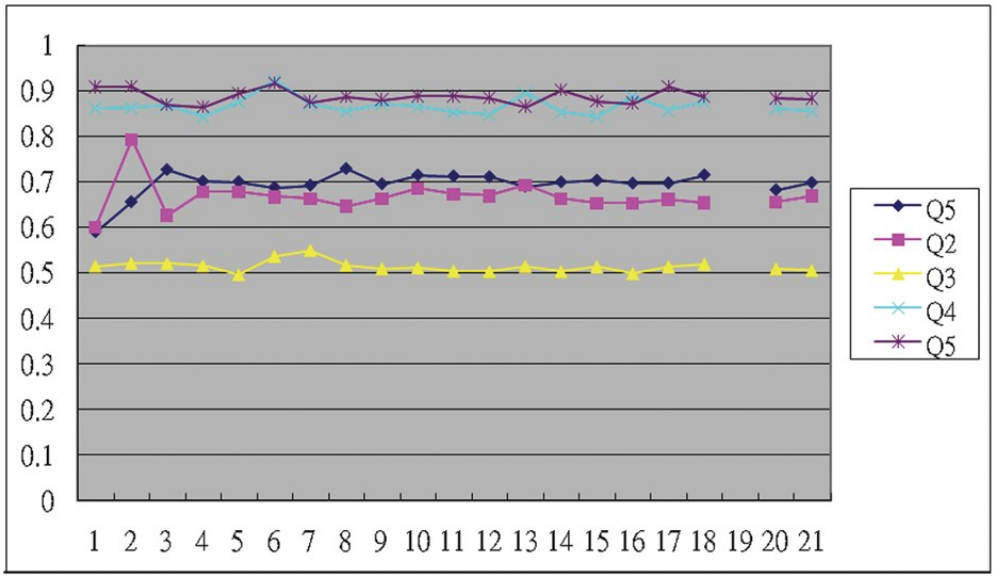
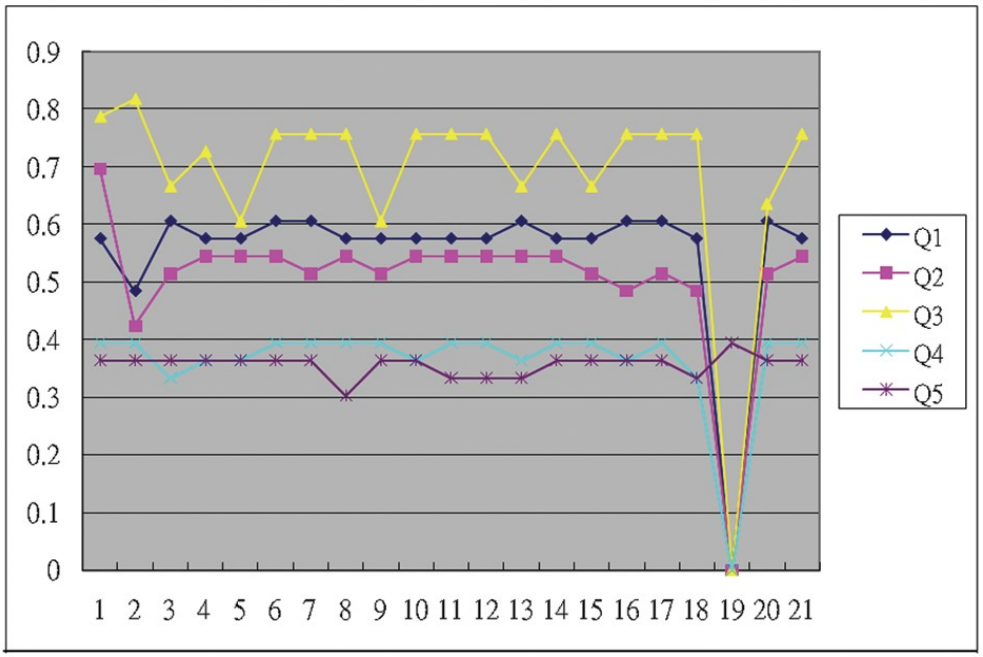


Figure 6. GOAL of GDX



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THE ROLE OF MANAGEMENT COMMITMENT AND EMPLOYEE INVOLVEMENT IN SAFETY MANAGEMENT

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Abstract

Researchers have recognized safety-related organizational factors have greater influences on safety performance. Little attention, however, has been focused on how these important organizational factors influence safety outcomes. This research explored the relationships among organizational factors (especially management commitment and employee involvement) and safety outcomes through structural equation modeling (SEM) analysis. Data were collected from front-line employees of Taiwanese steel plants. This research postulated that organizational factors would affect safety outcomes through safety management system and work group processes. SEM was used to test the relationships among these factors. Results revealed management commitment and employee involvement demonstrate different effects on safety management system and work group processes, which in turn influence employees' safety awareness and behavior. These findings provide valuable implications for improving safety management programs in other high-risk industries.

KEY WORDS: Safety management; Safety culture; Safety climate; Management commitment, Employee involvement

Introduction

Since the 1980s, a paradigm shift occurred from technical analysis period toward the organizational and management factors period in the research of accident causation theories (Zohar, 2014). All of the studies, either quantitative or qualitative, indicated that organizational factors can be viewed as antecedents of accidents occurrences for large complex systems (Reason, 1997; Seo et al., 2004; Casey et al., 2017) and as effective indicators to assess organizational safety (Flin et al., 2000). In the past thirty years, many studies related to safety management have focused on factorial structure of measurement scales and its predictive validity with regard to a variety of safety outcomes. (Colley et al., 2013; Flin et al., 2000; Glendon & Litherland, 2001; Zohar, 1980). However, much of the work in this field has focused on methodological rather than theoretical or conceptual issues (Zohar, 2010; 2014). To provide more theoretical foundations in this field, safety researchers have recently begun turning their attentions on the roles of organizational factors in relation to safety practices and unsafe behavior (Brown et al., 2000; Casey et al., 2017; Colley et al., 2013; Huang et al. 2014; McFadden et al., 2015; Oliver et al., 2002; Seo, 2005; Siu et al., 2004; Tomas et al., 1999). Much of the work has focused on the influences of leadership style on safety outcomes (Barling et al., 2002; Barling & Zacharatos, 1999; Kelloway et al., 2006; McFadden et al., 2015). Other organizational and management factors, such as organizational climate and safety climate, that have been found to be related to safety performance (Brown et al., 2000; Huang et al. 2014; Seo, 2005).

Among these organizational factors related to safety, management commitment and employee involvement have been widely viewed as the important factors influencing organizational safety (Brown & Holmes, 1986; Dedobbeleer & Beland, 1991; Flin et al., 2000; Glendon & Litherland, 2001; Wiegmann et al., 2002; Zohar, 1980). Studies have indicated that management commitment to safety is a critical factor significantly influencing organizational safety behaviors (Cheyne et al., 1998, Wiegmann et al., 2002; Zohar, 1980). In an effective safety program, upper management must demonstrate positive safety attitudes towards safety and their concern for employee well-being. While upper management demonstrates their organizational

commitment to safety, they will identify safety as a core value or guiding principles of an organization (Eiff, 1999). Barling & Zacharatos (1999) pointed out that high levels of management commitment to safety could enhance safety behavior of employees. Hofmann & Morgeson (1999) reached a similar finding, indicating that high-quality management support to safety enhances safety communication and safety commitment of employees, ultimately reducing workplace accidents.

In addition, persistent participation from operations personnel is also a fundamental prerequisite for a total safety culture (Geller, 1994). Employee involvement provides the viable solutions to improve safety problems and reveals their own commitment to safety (OSHA, 2017), which can increase employees' motivation to assume safety responsibility and reduce potentially unsafe behaviors and injuries of organization (Geller, 2001). Organizations with a good safety culture should involve employee suggestions to safety improvement and ensure that employees clearly comprehend their vital responsibilities in facilitating occupational safety. An effective safety management system in an organization should incorporate employees' concerns and suggestions at different hierarchical level.

Although management commitment and employee involvement are well recognized to significantly influence safety outcomes, exactly how these two safety-related organizational factors are associated with safety outcomes has seldom been addressed. Therefore, this study attempts to elucidate the relationships between the two factors and safety outcomes. We adopt the perspectives of how an organization functions to develop the conceptual structural framework (Hsu et al., 2008; Zohar, 2000). According to the hierarchy of organizational operation, upper management sets organizational goals in response to the fluctuations of external environment. They also make policies and devise organizational strategies to achieve the established goals. Middle level management formulates operating procedures and provides tactical action guidelines based on upper management policies and strategies. Line managers at work group level execute policies and procedures from upper and middle management, provide instructions to frontline workers, and monitor the work progress to ensure the operating performance (Zohar & Luria, 2005). Based on above concepts, we

develop a safety management model, which postulates that organizational factors affect safety awareness and behavior through safety management system and work group processes.

Linkages Between Management Commitment And Safety Outcomes

Zohar & Luria (2005) has indicated that the safety policies of upper management may influence the tactical action plans of frontline supervisors at the work group level. Once demonstrating an organizational commitment to safety, upper management prioritizes safety as a core organizational value. Upper managers also become personally involved in daily safety-related activities critical and decision-making meetings on safety to provide guiding organizational principles, which will facilitate frontline supervisors to play a more active supervisory role (i.e. more task instructions and progress monitoring) to comply with the expectations and requirements of upper management. Thus, increased supervisory involvement might make employees more aware of safety risks in the workplace and more receptive to comply with safety procedures and regulations. Simard & Marchand (1994) indicated that supervisory involvement in safety activities is effective in reducing accident rate. Therefore, we hypothesize the following.

Hypothesis 1a: In an organization with higher management commitment to safety will be positively related to the supervision of line managers. Additionally, increased supervision of line managers will be positively related to safety awareness and behavior of employees.

While demonstrating a persistent and positive attitude towards safety, management becomes intimately involved in critical safety activities within the organization (Wiegmann et al., 2002). They often improve organizational safety performance through holding safety related activities. Safety activities refer to how an organization promulgates safety policies and promotes safety management practices. Safety training and safety campaigns are the most common methods among safety-related activities. Safety training can upgrade knowledge expertise of employees towards safety operations. Safety campaigns can raise safety awareness among employees towards risk and safety-related capabilities. Holding safety training and campaigns will provide helps to

promote safety awareness and safety behavior of employees. We thus hypothesize the following.

Hypothesis 1b: In an organization with higher management commitment to safety will be positively related to safety activities. Additional safety activity efforts will be positively related to safety awareness and behavior of employees.

Furthermore, upper management with a high level of management commitment to safety provides adequate resources and methods to nurture and promote proactive system management. Here, proactive safety management refers to the perceived quality and effectiveness of a safety management system, including formalization of safety policies, formulation of safety procedures, as well as investigation of safety incidents/accidents, risk assessment and solutions. In an effective safety management system, upper management highly prioritizes proactive risk management of safety (Geller, 2001; Santos-Reyes & Beard, 2002). A proactive safety management within an organization might increase the safety risk awareness of employees in the workplace and encourage employees to actively participate in and comply with safety procedures and regulations. We thus hypothesize the following.

Hypothesis 1c: In an organization with higher management commitment to safety will be positively related to proactive safety management. A proactive safety management system will have positively related to safety awareness and behavior among employees.

Linkages between employee involvement and safety outcomes

As mentioned in earlier paragraph, employee involvement can increase a sense of responsibility among employees and hold accountable ownership for their safety actions, enabling them to concentrate on continuously elevating proactive safety management. That is, employees can participate in decision making, including formulation of safety policies, procedures and practices, as well as investigation and evaluation of safety incidents/accidents. Employees with incentives to offer their ideas and whose contributions are taken seriously are more satisfied and productive on the job (OSHA, 2009). Management that adopts em-

ployee suggestions will increases employees' motivation to make a difference and go beyond in ensuring organizational safety (Wiegmann et al., 2002; Geller, 1994), and in complying with safety records of organizations. Consequently, employees become proactive in safety management, which in turn increase their aware of safety risks in the workplace and actively comply with safety procedures and regulations. We thus hypothesize the following.

Hypothesis 2a: In an organization with higher employee involvement will be positively related to proactive safety management. A proactive safety management will be positively related to safety awareness and behavior among employees.

An organization with a good safety climate thus encourages employees to report safety problems without fear of retribution, as well as provides timely and valuable feedback to all employees (Wiegmann et al, 2002). Increased employee participation motivates them to constantly provide safety suggestions in the workplace, thus encouraging them to actively report safety concerns and share their knowledge expertise with colleagues (Geller, 1994). A reporting system can function as an effective feedback loop that enables management to understand safety problems in the workplace. This system also acts as an information sharing and organizational learning venue for incidents in the workplace, ultimately preventing future incidents proactively (IAEA, 2002; Reason, 1997). Employees who demonstrate free and uninhibited reporting of safety issues increase their safety awareness and willingness to comply with safety practices. We thus hypothesize the following.

Hypothesis 2b: In an organization with higher employee involvement will be positively related to safety reporting among employees. A sound safety reporting climate will be positively related to safety awareness and behavior among employees.

In addition, several accidents in high-risk systems are related to teamwork failure (Helmreich & Merritt, 1998). Teamwork, which comprises communication, coordination, and collaboration among team members, profoundly impacts safe operation. Employee involvement increases interaction and autonomy of team members, leading to a sense of

responsibility for safety among team members (Parker & Turner, 2002). A strong feeling of responsibility and ownership for safety can encourage workplace safety, subsequently increase group communication and collaboration and reduce monotony (Cohen & Ledford, 1994). Through safety reminders and knowledge sharing among team members, employee awareness of workplace risks can be enhanced. Additionally, cohesion and collaborative relations among work group members and supervisors are positively associated with safety compliance (Simard & Marchand, 1995, 1997). Hofmann & Stetzer (1996) indicated that group processes such as planning and coordinating approaches prevent team members from engaging in unsafe acts, subsequently resulting in fewer injuries and less unsafe behavior. In sum, with higher quality teamwork atmosphere in an organization will be help to increase the safety awareness and behavior. We thus hypothesize the following.

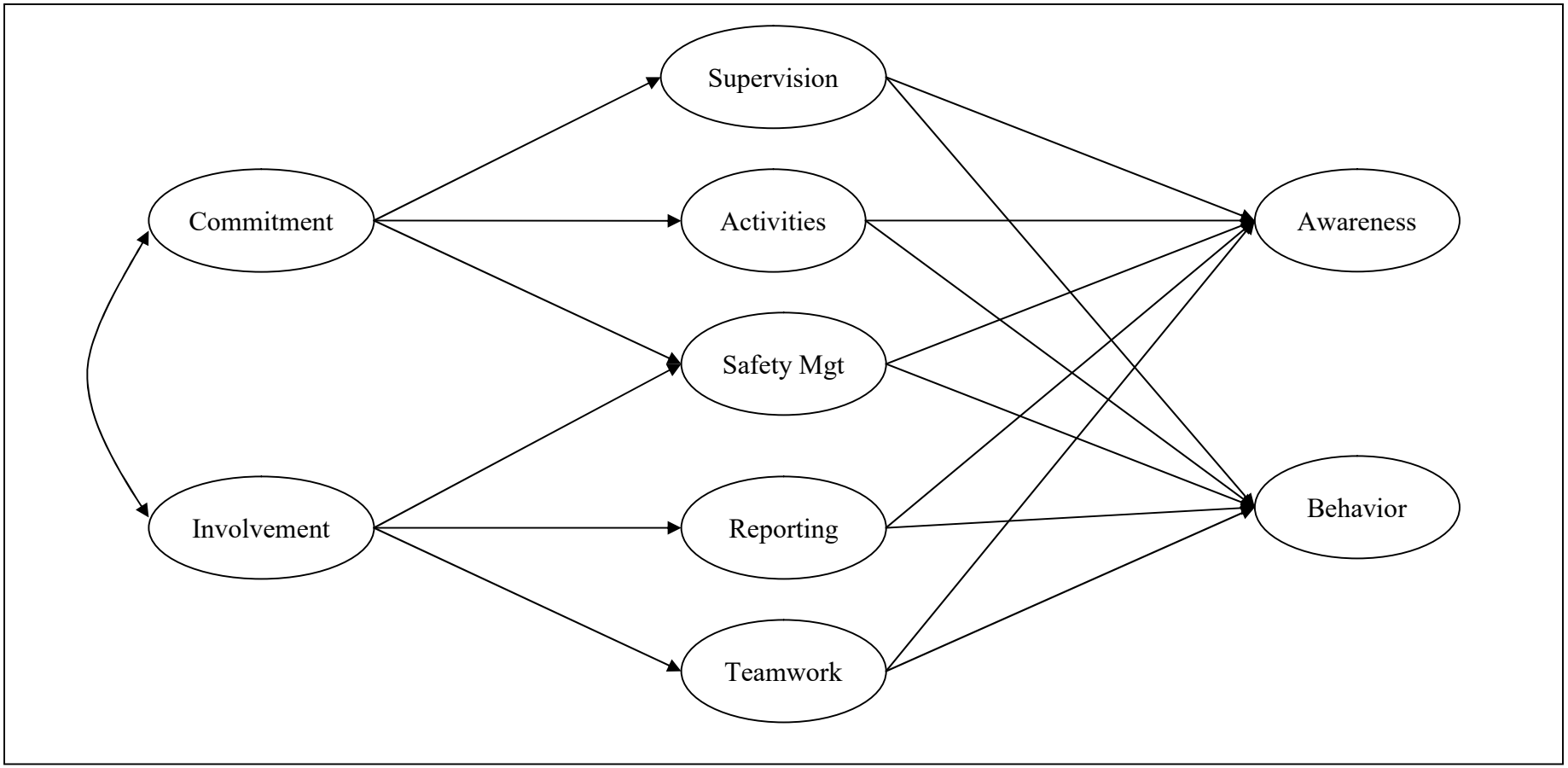
Hypothesis 2c: In an organization with higher employee involvement will be positively related to teamwork climate among employees. With higher quality teamwork climate will be positively related to safety awareness and behavior among employees.

Based on those relationships between organizational factors (management commitment and employment involvement) and safety performance (safety awareness and safety practices), a fully integrated structural model is developed. Figure 1 graphically depicts the relationships specified in the above hypotheses.

Methods

Participants

Survey questionnaires of this study were distributed to 350 frontline workers from steel plants of two steel companies in Taiwan. The participants were selected using a stratified random sampling method. Thus, the number of samples selected from a department was proportional to the relative size of the department in one company. The questionnaires were administered during working hours. The investigators described the procedures of the study, and promised confidentiality. The process was supervised by members of research team. Participants were asked to fill out the questionnaire anonymously and collected immediately by



Note. Commitment=Management commitment; involvement=Employee involvement; Activities=Safety activities; Safety Mgt= Proactive safety management; Reporting= Safety reporting; Awareness=Safety awareness; Behavior=Safety behavior

Figure 1. The hypothetical model of the present research

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Table 1. Profile of respondents from frontline employees (N=323)

Demographic variable	Respondents	
	Frequency	(%)
Gender		
Male	304	94%
Female	19	6%
Age		
21-30	23	7%
31-40	58	18%
41-50	123	38%
51-60	113	35%
>61	6	2%
Job categories		
Plant services	36	11%
Shop floor	264	82%
Other	23	7%
Work experience		
< 5 years	23	7%
6-10	39	12%
11-15	61	19%
16-20	68	21%
21-25	71	22%
>25	61	19%

investigators. The response rate was 92% (n=323). Respondent characteristics are shown in Table 1 above.

Materials and Measures

The survey questionnaire items were adopted from a safety assessment system questionnaire, as developed by the Central Research Institute of Electric Power Industry (CRIEPI) in Japan (Takano et al., 2001). Each questionnaire item uses a 5-point Likert-type scale, with answers ranging from 1 (strongly disagree) to 5 (strongly agree), indicating the extent to which the respondent agreed with items. The reliability and validity of the Taiwanese-version questionnaire has been demonstrated in earlier studies (Hsu, 2005; Hsu et al., 2008). To fulfill the objectives of this study, questionnaire items were selected in the above-mentioned factors from four categories: organizational factors, including management commitment and employee involvement; safety

management factors, including safety activities, proactive safety management and safety reporting; work group process factors, including supervision and teamwork; and safety outcome factors, including safety awareness and behavior. Table 2 lists the definition, item number, and an example item of each factor.

Data Analysis Procedures

Questionnaire items were analyzed to confirm the construct validity of the factor measurement model using confirmatory factor analysis (CFA), as conducted by LISREL version 8.54. The internal consistency reliability of each factor was examined using Cronbach's alpha coefficient (Churchill, 1991; Nunnally, 1978). The factor variables were analyzed using descriptive statistics and intercorrelations. Hypothetical structural relationships among organizational factors were examined using structural equation modeling (SEM), also conducted by LISREL version 8.54.

Measurement adequacy of CFA and SEM was evaluated using several goodness-of-fit indices, as recommended by researchers (Bentler, 1992; Bentler & Bonett, 1980; Joreskog & Sorbom, 1993; Maruyama, 1998): chi-square (χ^2), normed fit index (NFI); non-normed fit index (NNFI); comparative fit index (CFI); incremental fit index (IFI); root-mean-squared error of approximation (RMSEA). Bentler (1992) recommended NNFI, CFI, IFI scores of .90 or more indicate an acceptable data fit. A RMSEA value up to .05 indicates a good-model fit; a value of .08 or lower indicates a acceptable model fit; a value exceeding .10 indicates poor model fit (Joreskog & Sorbom, 1993).

Results

Measurement Model Testing

The overall measurement model fit was evaluated by χ^2 (557) =1614.95, $p < 0.01$. Since χ^2 is affected by sample size, we recommend using other fit indices. RMSEA values of 0.077 (i.e. lower than 0.08) indicate that the measurement model is an acceptable model fit. Others indices exceeding or near 0.9 indicate that the measurement model is acceptable (i.e. the NFI was 0.92; the NNFI was 0.94; the CFI was 0.95; the IFI is 0.95). In sum, test results indicate that the construct validity of factors is adequate. The Cronbach's alpha value of

Table 2. The definition, item number, example item for all constructs

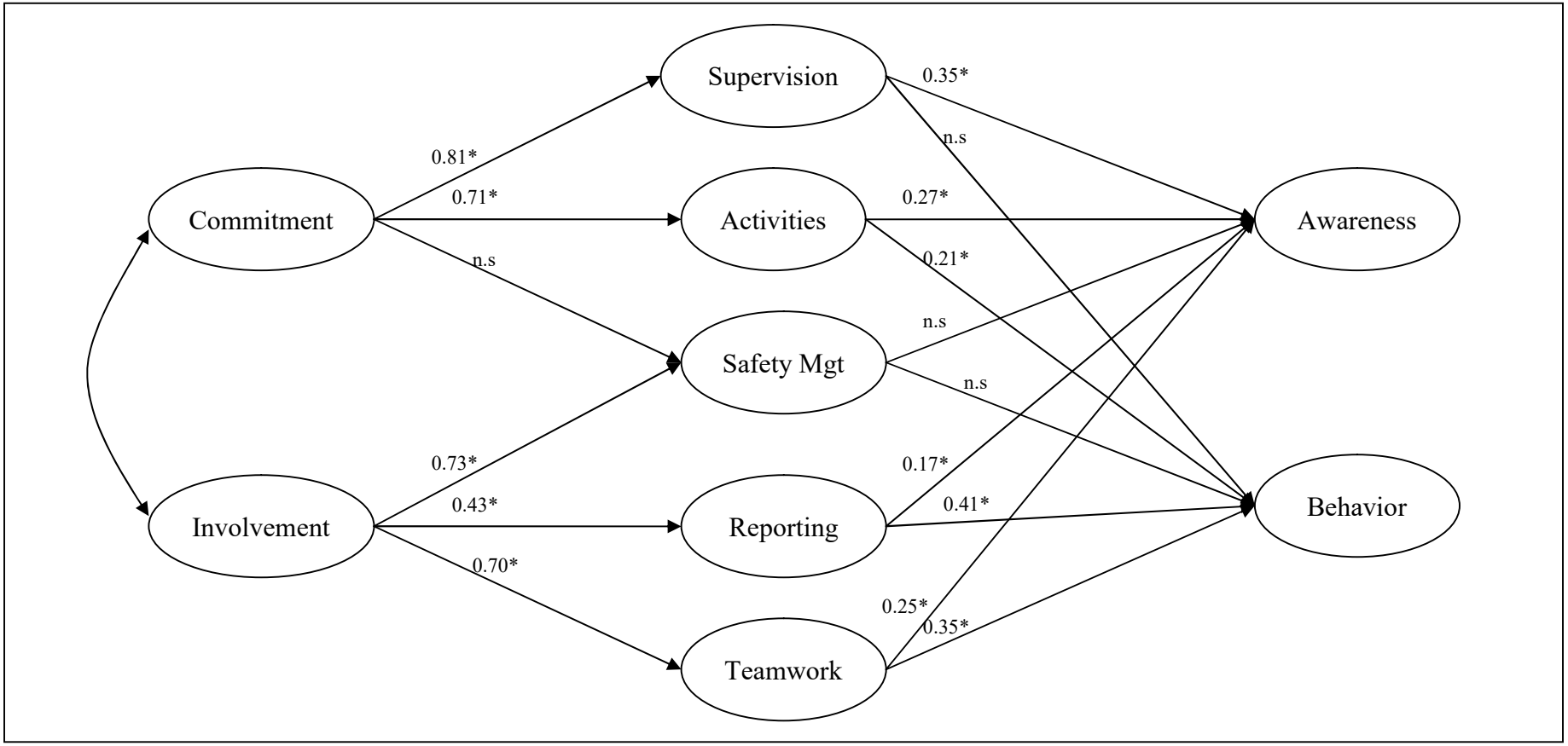
	Constructs (# of items)	Definition	Example item
1	Management commitment (4)	Top management identifies safety as a core value and demonstrates positive and supportive safety attitudes	Management places a high priority on safety operations in company
2	Employment involvement (4)	Employees are involved in safety meetings and safety decision-making processes.	Employees were involved in safety decision meetings in the workplaces
3	Safety activities (4)	The ways how an organization implements safety policies, and promotes safety management practices	Safety activities are frequently held at workplace.
4	Proactive safety management (4)	Perceived quality and effectiveness of proactive safety management system in an organization	The company modifies safety procedures in response to incident occurrence
5	Safety reporting (4)	Employees are willing to report safety problems of mistakes in the workplace	Coworkers are willing to making reports to upper management regarding safety mistakes
6	Supervision (4)	Supervisor's efforts spent in instructing and monitoring employee safety	Supervisors frequently go around inspecting the workplace.
7	Teamwork (4)	Communication, coordination, and collaboration among team members	Team members help each other finish their work.
8	Safety awareness (4)	Employees' risk perception to workplace	When in doubt about safety is in question, I proceed with great caution.
9	Safety behavior (5)	Employees' risk-taking behavior and compliance to safety rules and procedures	I comply with safety rules and procedures.

Table 3. Descriptive Statistics and Intercorrelations for all constructs in present study (N=323)

	Constructs	M	SD	1	2	3	4	5	6	7	8	9
1	Management commitment	3.96	0.59	0.85								
2	Employment involvement	3.84	0.61	0.71**	0.83							
3	Safety activities	4.00	0.60	0.77**	0.68**	0.87						
4	Proactive safety management	3.85	0.64	0.61**	0.75**	0.77**	0.79					
5	Safety reporting	3.64	0.49	0.20**	0.45**	0.27**	0.23**	0.67				
6	Supervision	3.83	0.61	0.68**	0.74**	0.63**	0.71**	0.17**	0.81			
7	Teamwork	3.74	0.53	0.55**	0.45**	0.44**	0.44**	0.26**	0.48**	0.75		
8	Safety awareness	3.95	0.54	0.59**	0.62**	0.60**	0.58**	0.20**	0.67**	0.45**	0.80	
9	Safety behavior	4.06	0.46	0.57**	0.51**	0.59**	0.55**	0.37**	0.50**	0.41**	0.57**	0.77

Element in the diagonal are the values of Cronbach's alpha for each construct

* $p < 0.05$. ** $p < 0.01$.



Note. Commitment=Management commitment; involvement=Employee involvement; Activities=Safety activities; Safety Mgt=Proactive safety management; Reporting= Safety reporting; Awareness=Safety awareness; Behavior=Safety behavior. *$p < .05$

Figure 2. The modified structural model with standardized path coefficients

each factor exceeds 0.6, demonstrating the adequacy of the internal consistency reliability of the questionnaire (Churchill, 1991; Nunnally, 1978). Table 3 lists the descriptive statistics and inter-correlations among the factors in different levels.

Structural Model Testing

The hypotheses of structural model depicted in Figure 1 were validated by performing structural equation modeling (SEM). The overall fit of the structural model was evaluated by χ^2 (577) =1760.07, $p <$ 0.01. Since χ^2 tends to be affected by sample size, other fit indices are used in this study. The values of RMSEA were 0.080 (near 0.08), indicating that the measurement model has a reasonable model fit. Others indices (the NFI was 0.91; the NNFI was 0.93; the CFI was 0.94; the IFI was 0.94) exceeded or approached 0.9, indicating that the structural model is acceptable. In sum, test results indicate that the structural model is adequate. According to model testing results, most paths in the structural model were statistically significant except four paths from management commitment to safety management, from safety management to safety awareness and behavior, and from supervision to safety behavior. Figure 2 presents the standardized path coefficients in the modified model.

Discussion

This study explores the relationships between management commitment and employee involvement and safety outcomes by performing structural model analysis. The results of the structural models revealed these two important organizational factors (management commitment and employee involvement) related significantly affect safety awareness and behavior of employees, which are consistent with previous studies, indicating that management commitment and employee involvement are essential to safety performance (Brown & Holmes, 1986; Dedobbeleer & Beland, 1991; Flin et al., 2000; Zohar, 1980). The findings of this research have several theoretical and practical implications for safety and organizational studies, which will be discussed as follows.

First, our results demonstrate that management commitment significantly affects the supervision of line managers. However, increased supervision has significant effects on employee safety awareness than employee safety behavior. This finding can be explained by that Taiwanese

line managers tend to be involved in daily safety activities and demonstrate their safety supervisory capability. Continuous work instructions and process monitoring from a line manager only increase risk awareness and safety knowledge of employees at the cognitive level, and the improvement of safety behavior is not significant. To promote safety behavior of employees, Taiwanese upper management and line management should emphasis on the importance of behavioral safety. They should provide visible management and become actively involved in implementing safety programs. Doing so would help all organizational members to understand clearly management commitment to safety, performance required and the measures achieving goals. Additionally, management should stress the importance of accountability to avoid employees from over relying on line managers. Employees should be held accountable for safety responsibilities, and their performance should also be evaluated in relation to standards or goals that yield positive consequences (OSHA, 2009).

Second, we find upper management commitment to safety has significant effects on safety activities, and however, the effect on proactive safety management is not significant. This result reveals management of Taiwanese steel industry tends to adopt an activity-based reactive approach to respond to safety problems. This finding is consistent with the research conducted by Hsu et al. (2008). In the workplace, the performance of holding safety activities and safety campaigns is apparent and attainable. Conversely, enhancement of proactive safety management practices requires additional efforts, and safety management performance is not apparent. Therefore, Taiwanese management should shift their style of safety management system from reactive approach to proactive approaches (Geller, 2001; Hsu et al., 2008, 2002). Although our research indicates holding safety-related activities such as training and campaigns are very important in promoting safety awareness and behavior, they should more heavily emphasize establishing the importance of proactive safety management system, especially with respect to preventing and controlling potential hazards at workplace. Establishing safe work practices and using personal protective equipment (PPE) can significantly reduce employee exposure to potential hazards. Companies should also computerize their hazard monitoring systems, which

can easily search hazards and accidents investigation reports and track their corrections. Moreover, management must be aware of possible emergency contingencies and plan the most effective means of controlling or preventing hazards during emergencies (Geller, 2001; Santos-Reyes & Beard, 2002; OSHA, 2009). In addition, we also find that employee involvement significantly affects proactive safety management in Taiwanese steel plants, which is consistent with the findings of Geller (1994), who stated employee involvement can improve safety management programs from reactive to proactive. It is a good way to increase proactive safety management through employee involvement. Employee involvement can provide an effective means of continuously solving safety problems and expressing their own commitment to safety, subsequently causing employees to more heavily emphasize the importance of proactive safety management (Wiegmann et al., 2002). To ensure their greater satisfaction and productivity on the job, employees should be invited to participate in management or specific purpose decision-making committees. They should be encouraged to provide recommendations and presentations at safety meetings, especially those employees who offer their ideas and whose contributions should also be taken seriously. Additionally, employees should be regularly involved in developing and modifying the site safety rules. They should also be authorized to conduct site inspections and participate in accident/incident investigations. Analyzing hazards in the work process and preparing safe work practices would help to eliminate or reduce workplace hazards. Taiwanese management should shift their thinking from top-down directive to bottom-up involvement (Geller, 2001).

Third, our results indicate that employee involvement significantly affects safety reporting among employees. An effective safety reporting system is the keystone of preventing accidents (Eiff, 1999, Reason, 1997). Employee involvement can also help to establish a good reporting culture, ultimately enhancing employees' safety awareness and behavior, which are consistent with the previous studies (Brown & Holmes, 1986; Dedobbeleer & Beland, 1991; Reason, 1997; Zohar, 1980). To establish a sound reporting culture, management should incorporate the employee suggestions in safety-related decisions for the safety reporting system. Employees should be encouraged to freely and uninhibitedly

report safety issues during daily activities (Wiegmann et al, 2002). Management should also avoid blaming an individual or group for mistakes of injury-producing incidents in the workplace. Mistakes or injuries provide an opportunity to accumulate facts from a system (Geller, 2001). For a successful safety program, employees must draw attention to safety mistakes without fear of retribution; otherwise, knowledge expertise is suppressed (Reason, 1997). Additionally, management should establish a structural feedback system to inform employees that their recommendations or concerns to occupational safety have been reviewed and what improvement actions are taken (Wiegmann et al., 2002).

Finally, our results indicate that employee involvement significantly can help to facilitate high quality of teamwork among employees, ultimately enhancing employees' safety awareness and behavior. This finding is consistent with the previous studies (Parker & Turner, 2002). Teamwork issues in the workplace have been increasingly paid more attention. To achieve the goals of operations in an organization, employees must be able to collaborate with others effectively. Employee involvement can enhance communication, coordination and collaboration of team members, and increase group cohesiveness. Therefore, management should stress the importance of teamwork building while involving employees into safety meetings or activities. To facilitate the high quality of teamwork, an organizational incentive system should be designed based on the team performance. Management should continuously encourage open information sharing among employees. Employees should also be invited to support team members by providing feedback on risks and assisting them to eliminate hazards. Additionally, management should establish an organizational learning culture. Through sharing knowledge expertise within an organization, teamwork quality increases, which will help to promote the safety awareness and behavior of employees.

Despite the above contributions, this study has certain limitations. First, this study was only one cross-sectional research, making it impossible for us to investigate how these two factors influence safety outcomes over time. This clear limits the extent to which we can make a causal inference. To further clarify the efficacy of this study, future studies should perform a longitudinal study. Second, the samples in this study are limited to Taiwanese front-line workers in the steel industry.

Results of this study clearly limit the extent to which we can make inferences for various high risk industries, thus necessitating further safety studies in different high risk industries. Third, according to previous studies (Barling & Zachararos, 1999; Barling et al., 2002; Hofmann & Morgeson, 1999; Kelloway et al., 2006), management leadership styles significantly affect safety outcomes. Future research should attempt to incorporate the role that leadership styles play in current studies. Fourth, previous studies indicated that these two safety-related organizational factors have cross-cultural characteristics. However, exactly how these two safety-related organizational factors influence safety management may differ across different cultures, thereby necessitation further comparative studies in other cultures.

Conclusion

As is widely recognized, management commitment and employee involvement significantly influence safety performance. However, exactly how these safety-related organizational factors influence safety outcomes has seldom been addressed. By performing structural model analysis, this study explores how management commitment and employee involvement and safety outcomes are related. Analytical results support our hypotheses, in which we postulate that management commitment and employee involvement significantly influence the safety awareness and behavior through a safety management system and work group processes. Results of this study have valuable implications for upgrading safety management programs in other high-risk industries.

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FACTORS AFFECTING SERVICE QUALITY, CUSTOMER SATISFACTION AND LOYALTY OF MOBILE PHONE SERVICE PROVIDERS IN VIETNAM

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Abstract

In recent years, the concepts of customer satisfaction and loyalty had become increasingly popular. Both academics and practitioners regard customer satisfaction and loyalty as being crucial to a company's success. One of the key challenges is how to manage service quality, a critical role to the satisfaction and the loyalty, in order to improve the satisfaction and enhance customer loyalty. The aim of this study is to analyze the factors affecting customer satisfaction and loyalty. Five dimensions in service quality (SERVQUAL), Reliability, Responsiveness, Assurance, Empathy and Tangibility, were included for this empirical research. Convenience sampling was used to collect 150 respondents of the service users for satisfaction and loyalty. Results confirmed that all the six proposed hypotheses and the customer satisfaction had positive influence on customer loyalty. The results also showed that "Empathy" had the greatest impact on satisfaction followed by "Assurance" and "Reliability". Finally, managerial implications were provided based on the results.

Keywords: SERVQUAL, satisfaction, loyalty, mobile phone service provider

Introduction

The aim of this study is to present an exploratory study using the SERVQUAL approach to assess the factors affecting the quality of Vietnam mobile phone provider's services and the relationship between the potential factors and customer satisfaction and between the customer satisfaction and loyalty. Although the approach had been used extensively to assess the quality of the service sectors (Ilyas et al. 2013), this study was different due to the dramatically changing environment met by all the mobile phone service providers in VN currently. A decade ago, the mobile phone industry in VN entered a totally new era when Vietnam became one of the WTO members on January 11th, 2007. Being a member of WTO implies that the entities providing mobile phone services have to face competitions from both domestic and international provid-

ers. According to the data of world bank (2016), the number of mobile phone subscribers in VN was 130.6 million in 2015, indicating that 142 mobile subscriptions as a percentage of the total population. However, the total mobile phone subscribers had maintained at the levels of 130 to 147 million since 2011. The saturated market suggests that the mobile phone service providers need to fulfil certain ways to retain or increase the market share in this competitive environment. In addition, the implementation of number portability regulations in VN is expected to become effective in 2018. Lower switching barriers in turn will further increase competition in the mobile phone market. The changes in Vietnam's mobile phone service market demonstrate the importance of identifying the factors that influence customer satisfaction and loyalty.

There is little doubt that the satisfaction and loyalty of the customers directly impact profitability since it is less expensive to retain existing customers than it is to continuously attract new customers (Berry, 1995). With the ever-increasing competitive environment and a saturated market of mobile phone in a developing country like Vietnam, the mobile phone service providers need to implement market strategies focusing not only on customer retention but also on acquiring new subscribers to increase market share. Some studies had supported that the SERVQUAL is suitable for the mobile phone service sectors (Turel and Serenko, 2006; Lai et al., 2007; Arokiasamy and Abdullah, 2013). SERVQUAL was based on research mostly in USA. Customers in other cultures, however, may perceive service quality differently (Tsoukatos and Rand, 2006), and others also suggested that culture and industry sector could impact customers' expectation of service quality (Furrer et al., 2000; Alnsour et al., 2014). As Vietnam has different cultural background and operating environment of its own, it is essential to understand the relationship between the potential factors with the customer satisfaction and loyalty and further establish effective strategies to follow.

Six mobile phone network providers are operating in VN currently. Among them, Viettel, founded in 2004 and a state-owned enterprise, has the largest market share of 40.7%. Vinaphone, the second largest provider, has a market share of 30%, followed by MobiFone, with market share of 17.9%. The questionnaires in this study were distributed to the users of the Viettel phone service provider.

Literature Review

Service quality is defined in many different ways depending on the object and the environment of the research. For a long time, many researchers have been trying to define and measure service quality. For example, Grönroos (1984) suggested two areas of service quality: (1) technology quality and (2) the function quality. According to Parasuraman et al. (1985), service quality is the gap between customer expectations and their perceptions after using the service. Parasuraman et al. (1988) provided five elements of service quality model, referred to as SERVQUAL. The SERVQUAL model provides a theoretical basis for examining the relationship between the service quality and customer satisfaction. Some empirical studies had shown that service quality was related to customer satisfaction (Zeithaml et al., 1996; Levesque and McDougall, 2000) and suggested that

service quality positively affected customer satisfaction (Kim et al., 2004; Turel and Serenko, 2006) and loyalty (Alnsour et al., 2014). In this study, the service quality was measured using the SERVQUAL questions developed by Parasuraman et al. (1988) with minor adaptations due to the translation into Vietnamese.

Regarding the definition of satisfaction, several concepts had been proposed. Among the definitions, certain ideas such as "consumers' response", "person's feelings", "customer's attitude", and "perception" are always mentioned (Oliver, 1999; Kotler and Armstrong, 2012). Thus, satisfaction can be seen as a post-evaluation of products or services with expectations taken into consideration and is a function of the difference between results and expectations (Grönroos, 2004, Kotler and Armstrong, 2012). The influences of different factors on the customer satisfaction were intensively investigated in mobile phone industries recently. In 2012, Mohafez et al. adapted the model presented by Turel and Serenko (2006) to investigate the impacts of various factors on the customer satisfaction, complaint and price tolerance. The study by Arokiasamy and Abdullah (2013) investigated the impacts of the five dimensions in SERVQAL on the customer satisfaction. Kruger and Mostert studied the influence of relationship intention on cell phone users' satisfaction, loyalty and retention after service recovery (2014). Their findings revealed significant positive relationships between respondents' relationship intentions and satisfaction, loyalty and retention. Since customer satisfaction is based on the customer's experience on a particular service encounter, it is in line with the fact that service quality is a determining factor of customer satisfaction because service quality results from service outcome from the service providers. The level of service quality has potential impacts on the customer satisfaction. Thus, customers compare the overall perceived and expected service delivery to form subjective judgement of satisfaction.

Customer satisfaction and loyalty are highly correlated but form two distinct constructs (Leverin and Liljander, 2006). Loyalty is interpreted as consumers' repeated purchase behavior of certain products or services brand without any commitment (Kotler and Armstrong, 2012). The customers with higher level of loyalty have more positive influences on the sustainability of the business because satisfied customers have a higher lifespan value to service providers, as these customer will spread positive word-to-mouth and are more likely to establish partner relationship with the service providers (Dorai and Varshney, 2012). Loyalty comprises both attitudinal and behavioral dimensions, which can be jointly referred to as composite loyalty (Dick and Basu, 1994, Oliver, 1999). Some studies indicated that there was a direct positive relationship between satisfaction and loyalty (Homburg et al., 2003; Lee, 2010; Ganiyu et al. 2012). Vázquez-Casielles et al. (2009) concurred by suggesting that customer satisfaction influences attitudinal loyalty particularly through a positive effect on repurchase intention, price tolerance, and positive recommendations. Hence, the relationship between customer satisfaction and the loyalty in the telecommunication industry of Vietnam was explored in this study. The scale of Zeithaml et al. (1996) consists of five variables; this research applied this scale as it was deemed appropriate with the circumstances.

Research Process and Method

Based on the literature discussed above, all five dimensions, Reliability, Responsiveness, Assurance, Empathy, and Tangibility in the SERVQUAL were maintained and served as the independent variables to customer satisfaction and the customer satisfaction was furthermore served as the independent variable to the customer loyalty in this study. The framework of the questionnaire was based on the results obtained by Parasuraman et al. (1988). As to the satisfaction and loyalty dimensions, the authors discussed directly with 5 customers and Viettel managers respectively with the contents of "the factors affecting the satisfaction and loyalty." After finishing the first draft of questionnaire, the authors asked the participants the question "what else factors could have impacts on the satisfaction and loyalty?" The final edition was made according to the suggestions of the customers and managers and was used in the official research.

H1: Reliability has a positive effect on customer satisfaction.

H2: Responsiveness has a positive effect on the customer satisfaction.

H3: Assurance has a positive effect on customer satisfaction.

H4: Empathy has a positive effect on customer satisfaction.

H5: Tangibility has a positive effect on customer satisfaction.

H6: Customer satisfaction has a positive effect on customer loyalty.

The research processes in the study were as follows:

(1) The pilot test was employed to identify the ambiguity and correction for this particular case. The authors also put the data collected in the pilot test in the reliability test to determine which observed variables should be kept or removed.

(2) After correcting the questionnaire, the authors came up with the official questionnaire and started the survey.

(3) The official research is implemented by using quantitative research methods. The methods used were descriptive statistics, factor analysis, correlation, and regression analysis.

Two major parts included in the questionnaire are: (1) demographic information of the respondents, (2) assessment on customer's satisfaction and loyalty. In the first part of the questionnaire, the nominal scale was used to categorize the customer into groups (gender, age and living location). In the second part of the questionnaire, a 5-point Likert scale (1 – Strongly Disagree, 5 – Strongly Agree) was used to measure the observed variables. As the Likert scale is a type of interval scale, it is possible to collect and analyze the collected data to identify the correlation and the regression relationship between independent and dependent variables. A total of 170 questionnaires were collected. After screening, 20 of them were ignored and150 samples were valid, which accounted for a proportion of 89%. The data collected were analyzed with statistical software PASW-SPSS 20.0.

Research Results

Two hundred questionnaires were released and a total of 170 questionnaires were returned, of which 20 were discarded as incomplete, which resulted in 150 valid samples as shown in Table 1.

Table 1. Profile of respondents involved in this study

		Frequency	Percentage (%)
Gender	Male	94	62.7
	Female	56	37.3
Age	Under 25	7	4.7
	25 - under 35	64	42.7
	35 - under 45	59	39.3
	Over 45	20	13.3
Location	Rural	57	38.0
	Township	14	9.3
	Town	34	22.7
	City	45	30.0

Reliability test was conducted first to check the validity of the questionnaire scale. The Cronbach's alpha for individual variables of reliability (0.761), responsiveness (0.809), assurance (0.835), empathy (0.928) and tangible (0.865) indicated that the measure is compositely reliable and internally consistent. However, the item REL1 has an Item-Total Correlation of less than 0.3 and was removed from the scale and the associated Cronbach's alpha coefficient of variable reliability increases to 0.826. Factor analysis extracted five factors from 21 observation variables and the extracted variance was 72.308%. Based on the results of the Rotated Component Matrix, the TAN22, having a weight of less than 0.3 is omitted from the construct. After the inappropriate variables were removed, the components of factors affecting satisfaction are measured by 20 observation variables. Factor analysis results at the second round showed that total variance extracted from five factors with eigenvalues greater than 1 are equal to 72.628% as shown in Table 2.

To indicate the relationships among factors of service quality and customer satisfaction, Pearson product-moment correlation coefficients (r) are applied. Table 3 shows that there are positive and significant relationships between all five independent variables and the dependent variable of customer satisfaction (SAT). Among the factors, the EMP has the highest correlation coefficient of $r=0.686$ ($p<0.01$), followed by ASS with $r=0.530$ ($p<0.01$), TAN with $r=0.525$ ($p<0.01$), REL with $r=0.514$ ($p<0.01$) and RES with $r=0.481$ ($p<0.01$). The correlation indicates that an increase in these five independent variables would lead to an increase in customer satisfaction. These correlations are also further evidences of validity and reliability of measurement scales used in this research. Regarding to the average scores in each dimension of SERVQUAL, assurance ranks highest

Table 2. Factor Analysis of user's satisfaction to service providers

Items	Factor Loadings	Eigenvalues	Variance explained (%)	Cumulative Variance (%)	Cronbach's alpha
EMP14	.680	7.780	38.900	38.900	0.928
EMP15	.835				
EMP16	.843				
EMP17	.876				
EMP18	.731				
ASS10	.818	2.231	11.157	50.056	0.835
ASS11	.721				
ASS12	.749				
ASS13	.744				
REL2	.809	1.787	8.934	58.990	0.826
REL3	.793				
REL4	.803				
REL5	.651				
RES6	.791	1.475	7.376	66.366	0.809
RES7	.780				
RES8	.844				
RES9	.550				
TAN19	.778	1.252	6.261	72.628	0.865
TAN20	.816				
TAN21	.823				

Table 3. Means, standard deviation and correlation matrix

Construct	Mean	SD	SAT	REL	RES	ASS	EMP
SAT	3.58	0.874					
REL	3.44	1.155	0.514**				
RES	3.49	0.948	0.481**	0.237**			
ASS	4.10	0.824	0.530**	0.315**	0.362**		
EMP	3.61	0.986	0.686**	0.503**	0.437**	0.515**	
TAN	3.59	0.880	0.525**	0.306**	0.462**	0.470**	0.489**

** $p<0.01$

followed by empathy and tangibility. The reliabilty and responsiveness are relatively low in the five constructs.

The multiple regression analysis of the effects of service quality on customer satisfaction is shown in Table 4. The hypotheses in this study predicted that SERVQUAL dimensions would positively affect customer satisfaction. Results of regression analysis indicated that the independent variables explained 57.1 percent of the variance in the dependent variable (customer satisfaction), illustrating a significant and positive effect of SERVQUAL dimensions ($p<0.000$). The results pointed out that a strong relationship existed between

SERVQUAL and the satisfaction. According to Table 5, all five dimensions of service quality had significantly positive effects on customer satisfaction. The effect of empathy (EMP) ranked first (standardized coefficient of 0.371), followed by reliability (REL) (0.200), assurance (ASS) (0.156), responsiveness (RES) (0.151), and tangibility (TAN) (0.140). The results support all five hypotheses proposed in this study. The regression analysis of the effects of satisfaction on loyalty is shown in Table 5. According to the results, the · of 0.756 indicated that the customer satisfaction had significant and positive impact on customer loyalty. The sixth proposed hypothesis was also supported. Both the standardized regression functions are shown below.

Table 4. The multiple regression analysis of the effects of service quality on customer satisfaction

	.	t	Sig
Constant		-1.393	.166
REL	.200	3.210	.002
RES	.151	2.386	.018
ASS	.156	2.371	.019
EMP	.371	5.050	.000
TAN	.140	2.080	.039
R square		.585	
Adjusted R square		.571	
F(p-value)		40.669 (.000)	

Table 5. The regression analysis of the effects of customer satisfaction on loyalty

	.	t	Sig
Constant		6.132	.000
SAT	.756	14.036	.000
R square		.571	
Adjusted R square		.568	
F(p-value)		197.0239 (.000)	

Discussion

According to the users' perceptions, the highest agreed upon dimension in the SERVQUAL model was assurance (M=4.10). Thus, one can infer that the users are the most satisfied with the assurance dimension. This could imply that the employees of Viettel were well educated and trained and that the customers felt confident about the operations the employees fulfilled. Empathy has the highest positive correlation coefficient (r=0.686) and the strongest impact (β=0.371) on the service satisfaction and ranks the second highest in the SERVQUAL dimension. Empathy refers to the service provider's attention, con-

cerns, and understanding of the customers' needs. The results pointed out that the mobile phone service providers should devote themselves more on the individual attention or users' best interest at heart in order to increase the users' overall satisfaction. The arrangement of employees with better a sense of and understanding about psychology and demand of customer is one of the available approaches the Viettel can adapt. Some policies that the Viettel can implement include adjusting the promotion criteria, enriching the training programs, creating a friendly environment. Additionally, they can enhance soft skills such as smiling through conversations, strengthening communication skills, and so on. According to the results of regression analysis, reliability has the second largest impact on satisfaction.

The perceived score, however, is the lowest of the five dimensions. This implies that the customers expressed relatively low level of consent about what Viettel promises to do. Therefore, Viettel needs to consider establishing a standard service process and updating practical service process in order to meet requirements from customers punctually and further improve customer satisfaction. Responsiveness has a relatively medium level of contribution to satisfaction and loyalty of customers. This factor implies that the staff must be warm to the customers. Guidance map should be designed clearly and be at convenient location so customers may feel easy to follow up while processing. Besides, the website of the company should have detailed explanations and clear linking maps for the customers. This would help the customers interact quickly and conveniently at remote locations and further decrease the service loadings or costs at the local office since some services have been replaced by the website. The results illustrated that the tangible devices and facilities of Viettel accounted for the lowest percentage on fluctuated customer-service satisfaction. The results could imply that the customers are much more concerned about the reliability, assurance, and responsiveness instead of the tangible factors. However, Viettel should also put forth more effort on this item since the appearance image can also have positive impacts on the service quality (Bitner, 1990; Alnsour et al., 2014).

Conclusions and Limitations

Mobile phone user's satisfaction toward the service quality, provided by the largest market share of service providers in Vietnam, was measured in terms of reliability, responsiveness, assurance, empathy, and tangibility by using the SERVQUAL model. Five hypotheses were proposed to predict that the service quality dimensions would positively affect customer satisfaction and the sixth hypothesis predicted that the customer satisfaction would have a positive impact on customer loyalty. A quantitative approach was exploited to determine how the mobile phone users perceived the aforementioned dimensions, the users' overall satisfaction with the service they received, and the relationship between the customer satisfaction and loyalty. The results supported these predictions by the data collected in VN and concurred with the outcome of other studies on traditional service quality setting (Parasuraman et al., 1988; Bitner, 1990) and mobile phone users' perception of service quality (Lai et al., 2007; Lee, 2010; Arokiasamy and Abdullah, 2013). Service quality positively influenced customer satisfaction, indicating that when mobile phone compa-

nies provide good service quality, customer satisfaction can be enhanced.

Although the authors believed that this research has contributed positively to Viettel in understanding the factors affecting satisfaction and customer loyalty, these findings should be viewed with some limitations. The study used convenience sampling, targeted at customers in the transaction at Viettel Company only and 150 samples may not be large enough to generalize the whole picture of the mobile phone service industry in Vietnam.

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EXPLORING HOW AFFECTIVITY INFLUENCE ON JOB BURNOUT THROUGH ORGANIZATIONAL POLITICS PERCEPTION

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Abstract

Recent years have seen increased attention being given to job burnout. However, within the extensive literature, comparatively little research has focused on between organizational politics, negative and positive affectivity, and burnout. Therefore, the purpose of this study is to use organizational politics as a mediator to explore how negative and positive affectivity influence on burnout. A total of 521 hotel managers participated in this study. Data were analyzed using LISREL. Results indicated that through organizational politics, employees high in negative affectivity tend to more exhaustion and disengagement than positive affectivity.

Keywords: Job burnout, Organizational politics, Affectivity

Introduction

It is a stressful working situation to work with hotel industry. Long working hours including nights and weekends, low pay and stress from difficult guests are the factors employees' job burnout come from and decide to leave the industry. Most previous studies about job burnout focus on role conflict, role ambiguity, poor management, poor communication and work overload (Zellars et al., 2000; Allen and Mellor, 2002; Goddard et al., 2004). Very little empirical research has been conducted on the effect of organizational politics, negative and positive affectivity. Therefore, the purpose of this study is to develop a model to investigate the relationship between organizational politics, negative and positive affectivity, and burnout.

Literature Review

Organizational politics whereby "organizational members attempt either directly or indirectly to influence other members by means not sanctioned by formal standard operating procedures or informal norms, in an attempt to achieve personal or group objectives" (Witt et al., 2000) is a potent reality in today's organizations. Indeed, recent reviews and empirical studies show that favoritism, unfair practices, unfair rewards and promotions are rampant in hospitality-related job settings (Wan, 2010). Employees working in politically charged work environments where unfair outcomes, procedures, and favoritism are widespread are susceptible to work-related strain (Ross, 2005). These coupled with limited career and promotional opportunities, inadequate training and rewards that permeate in the hospitality industry (Kusluvan et al., 2010) may heighten employees' tendencies to engage in organizational politics.

Trait affect, also referred to as affectivity, is a stable dimension of personality (Thoresen et al., 2003). It is dispositional, enduring and differs from state affect which is transitory, situational and momentary (Thoresen et al., 2003). High negative affectivity individuals tend to perceive the world around them in a generally more negative way and often appear to be anxious, nervous and afraid (Cropanzano et al., 1993). As Watson and Clark (1984) argue, individuals with high negative affectivity often experience discomfort across situations, even in the absence of overt stress. Individuals low in negative affectivity are calm and serene. Evidence shows that negative affectivity erodes job satisfaction and organizational commitment, and intensifies absenteeism and turnover intentions (Thoresen et al., 2003).

On the contrary, research shows that positive affectivity enhances creativity, increases job satisfaction and organizational commitment, lowers absenteeism, and reduces turnover intentions (Amabile et al., 2005; Thoresen et al., 2003). High positive affectivity entails full concentration, enthusiasm, high energy, excitement, pleasurable engagement and determination (Watson et al., 1988). Individuals high in positive affectivity tend to perceive events and other individuals in a generally more positive manner (Iverson et al., 1998). Individuals with low positive affectivity are more likely to experience feelings of fatigue and apathy (Watson et al., 1988).

Both negative and positive affectivity influence employees' perceptions of organizational politics, which is a dysfunctional side of organizational life and a potential source of stress (Treadway et al., 2005). Individuals with high negative affectivity react more strongly to stressful situations (Watson and Clark, 1984). They are more prone to elevated levels of perceptions of organizational politics (Adams et al., 2008) whereas individuals high in positive affectivity

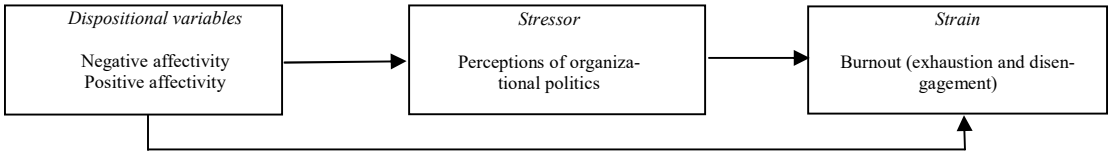

Figure 1 Research Model

tend to have lower perceptions of organizational politics (Adams et al., 2008). Both negative and positive affectivity also affect exhaustion and disengagement. Exhaustion refers to "a consequence of intensive physical, affective, and cognitive strain Disengagement, in turn, is defined as "distancing oneself from one's work, and experiencing negative attitudes toward the work object, work content, or one's work in general" (Demerouti et al., 2001). Research indicates that negative affectivity exacerbates burnout, while positive affectivity reduces it (Thoresen et al., 2003). Research also shows that employees' perceptions of organizational politics intensify burnout (Advani et al., 2005; Huang et al., 2003).

Figure 1 shows the proposed model of this study. Perceptions of organizational politics act as a partial mediator of the effects of negative and positive affectivity on exhaustion and disengagement. We contend that the effect of negative affectivity on burnout via organizational politics perceptions is higher than positive affectivity. Grandey (2000) argues that individuals high in negative affectivity respond more strongly to negative events as they are pessimistic and have aversive mood states. Such individuals have difficulty in regulating their emotions in stressful work situations and experience higher levels of burnout.

Empirically, Adam et al.'s (2008) study indicates that the impact of negative affectivity on organizational politics perceptions is much higher than that of positive affectivity.

Thoresen et al. (2003) meta-analytic inquiry demonstrates that the associations of negative affectivity with emotional exhaustion and depersonalization are higher than that of positive affectivity. Also research shows that positive affectivity influences job satisfaction more strongly than negative affectivity (Connolly and Viswesvaran, 2000). Such findings are consistent with the affect matching hypothesis which states that negative affectivity predicts perceptions of unpleasant events and positive affectivity predicts perceptions of pleasant events (Valle et al., 2002). In other words, negative affectivity is linked to negative consequences, while positive affectivity is linked to positive consequences. Therefore, we advance the following hypotheses:

H1. The indirect influence of negative affectivity on exhaustion, through organizational politics perceptions, is stronger than the indirect influence of positive affectivity.

H2. The indirect influence of negative affectivity on disengagement, through organizational politics perceptions, is stronger than the indirect influence of positive affectivity.

Methodology

From previous empirical studies in the relevant literature, a questionnaire was developed to investigate the relationship between organizational politics, negative and positive affectivity, and burnout. Data were gathered from a sample of full-time frontline employees in five-star hotels in Taiwan in 2017. A number of 600 questionnaires were distributed to frontline employees working in these hotels. After removing the records containing heavily missing values, a total of 521 responses remained in the analysis.

The measures of all the perceptual study variables were subjected to an exploratory factor analysis (principal components) with oblique rotation. The factors collectively accounted for 56% of the variance in item scores. The first factor explained only 24.9% of the variance, which is much less than the 50% benchmark used in Harman's single-factor test to determine if common method variance is present. This result suggests that common method bias may not be a problem. All items loaded on their respective underlying factors where loadings ranged from .47 to .87 with an average of .66. Furthermore, all the cross-loadings were less than .30. These results provide initial evidence that the measures exhibit convergent and discriminate validity. Also the measures demonstrated acceptable levels of internal consistency reliability where coefficient alphas were .77 (negative affectivity), .76 (positive affectivity), .88 (perceptions of organizational politics), .78 (exhaustion) and .75 (disengagement).

Results

We conducted two separate path analyses through LISREL 8.30 to estimate the relationships depicted in our conceptual model and to test the research hypotheses. First, we used the estimated covariance matrix of the underlying latent constructs (including the single-item tenure) resulting from a test of the measurement model which explicitly included a method factor. This covariance matrix is free from measurement error and from any bias due to common method variance; hence it is purified. Second, we also conducted path analysis using the covariance matrix obtained from aggregate measures for each construct in the model by averaging scores across all items of a particular scale. These aggregate scores represent model constructs at a molar level of abstraction, but they are not necessarily free from measurement error and common method variance. The comparative results provide insight

regarding the influence of measurement error and common method variance. The correlations, means and standard deviations of the aggregate variables are presented in Table 1.

As shown in Table 1, the mean scores of exhaustion and disengagement in our study were 2.28 and 2.57. We compared these averages to the mean scores obtained in other studies which used the Oldenburg Burnout Inventory (OLBI) (Demerouti et al., 2001) to measure job burnout among employees in other professions. In their Dutch study, Bakker et al. (2004) reported that the mean scores of exhaustion and disengagement among employees working in such jobs as industrial work, health care, trade, and construction were 2.09 and 2.16. Halbesleben and Demerouti (2005) in their U.S. study reported that the mean scores of

Table 1 Correlations, means, standard deviations and internal consistency reliability estimates (Cronbach's alpha) of study variables

Variables	1	2	3	4	5	6
1 Negative affectivity (NA)	1.00					
2 Positive affectivity (PA)	- .05	1.00				
3 Perception of organizational politics (POPS)	.35	- .22	1.00			
4 Exhaustion (EXH)	.41	- .08	.39	1.00		
5 Disengagement (DENG)	.28	- .37	.57	.46	1.00	
6 Organizational tenure (TEN)	- .11	- .07	- .10	- .13	- .06	1.00
Mean	2.86	3.08	3.01	2.28	2.57	2.28
Standard deviation	.95	.90	.74	.53	.48	.81
Alpha	.77	.76	.88	.78	.75	-

Note: Composite scores for each construct were calculated by averaging respective item scores. The scores for NA, PA, and POPS ranged from 1 to 5, while the scores for EXH and DENG ranged from 1 to 4. Higher scores indicated higher NA, PA, POPS, EXH, and DENG. Tenure was recorded using a four-point scale, ranging from 1 (less than a year) to 4 (more than 10 years). Correlations >|.11| are significant at the .05 level.

Table 2 Tests of the research model and hypotheses

Estimated effects	Results based on covariance matrix input from of measurement and method effects		Results based on covariance matrix input from aggregated scale scores		
	Standardized estimate	*t*-values	Standardized estimate	*t*-values	Hypothesis test result
NA→POPS	.39	10.49	.33	8.80	
PA→POPS	- .15	- 4.13	- .21	- 5.62	
NA→EXH	.30	8.23	.31	8.30	
PA→EXH	- .12	- 3.17	- .01	- 0.12	
NA→DENG	.05	2.03	.10	2.92	
PA→DENG	- .16	- 6.80	- .25	- 7.89	
POPS→EXH	.37	10.20	.28	7.18	
POPS→DENG	.74	28.54	.48	14.07	
Hypothesis 1:					Supported
Indirect influence (mediated by POPS) of:					
NA on EXH	.14	7.31	.09	5.56	
PA on EXH	- .06	- 3.83	- .06	- 4.42	
Hypothesis 2:					Supported
Indirect influence (mediated by POPS) of:					
NA on DENG	.29	9.85	.16	7.46	
PA on DENG	- .11	- 4.09	- .10	- 5.22	
Model fit statistics:	χ^2_2 = 1.38 (p = .50), RMSEA = .00, NFI = 1.00, CFI = 1.00, SRMR = .007		χ^2_2 = 4.09 (p = .13), RMSEA = .041, NFI = .99, CFI = 1.00, SRMR = .016		
	R^2 for: POPS = .23, EXH = .38, DENG = .68		R^2 for: POPS = .17, EXH = .23, DENG = .39		

Note: RMSEA = root mean square error of approximation; NFI = normed fit index; CFI = comparative fit index; SRMR = standardized root mean square residual. NA = negative affectivity, PA = positive affectivity, POPS = perceptions of organizational politics, EXH = exhaustion, DENG = disengagement. The control variable tenure had a significant negative impact on only POPS under both covariance input conditions (_ = −.07, t = −1.91 and _ = −.08, t = −2.04 respectively).
With the exception of PA → EXH under covariance input from aggregate scores, all direct linkages are significant at the .05 level. In addition, the indirect effects of NA and PA on EXH and DENG are significant beyond the .05 level.

exhaustion and disengagement among working adults in telecommunications, manufacturing, and banking/financial services were 2.99 and 2.87 at Time I, and 2.78 and 2.99 at Time II. They also reported that the mean scores of exhaustion and disengagement among fire department employees were 3.29 and 2.96. In a study conducted with nurses in the Netherlands, the mean scores of exhaustion and disengagement were found to be 2.24 and 2.29 (Bakker and Heuven, 2007). These findings suggest that frontline hotel employees in our study scored somewhat higher on the two components of burnout than employees in industrial work, health care and construction in Bakker et al. (2004) and nurses in Bakker and Heuven (2007) stud-ies. However, they scored lower on exhaustion and disengagement than fire department and banking/financial services employees in Halbesleben and Demerouti (2005) study.

The results of two separate path analyses are presented in Table 2. It should be noted that direct influences from both negative and positive affectivity constructs to exhaustion and disengagement were allowed as part of testing our research model in Fig. 1 since they were statistically significant. As shown in Table 3, the model fits the data very well under both input conditions (with covariance input free from measurement error and common method variance: $\chi^2_2 = 1.38$, $p = .50$, RMSEA = .00, NFI = 1.00, CFI = 1.00, SRMR = .007; with covariance input obtained from aggregate scale scores: $\chi^2_2 = 4.09$, $p = .13$, RMSEA = .041, NFI = .99, CFI = 1.00, SRMR = .016). The results from the purified covariance input show that the model explains 23% of the variance in perceptions of organizational politics, 38% in exhaustion, and 68% in disengagement, while the corresponding results based on the covariance matrix of aggregate scores are 17%, 23%, and 39%, respectively.

The path coefficients and t-values in Table 2 indicate that the results from the two covariance inputs are comparable in terms of statistical significance. The only exception is the direct effect of positive affectivity on exhaustion, which is not significant under covariance input from aggregate scale scores ($\gamma = -.01$, $t = -.12$). Both sets of results indicate that negative affectivity has a significant positive effect on perceptions of organizational politics, exhaustion and disengagement, while positive affectivity exerts significant negative effects. In addition, perceived organizational politics significantly increase frontline employees' exhaustion and disengagement.

H1 and H2 predict that negative affectivity exerts a stronger influence, relative to the influence of positive affectivity, on exhaustion and disengagement through perceptions of organizational politics. The results in Table 3 show that indirect influences (mediated by perceptions of organizational politics) of both negative affectivity and positive affectivity on exhaustion and disengagement are statistically significant. Consistent with H1, the absolute strength of the indirect influence of

negative affectivity on exhaustion under both covariance input conditions (.14 and .09) is much higher than the absolute indirect influence of positive affectivity (−.06 under both covariance input conditions). In fact, in absolute terms, the indirect influence of negative affectivity on exhaustion is more than twice the absolute magnitude of indirect influence exerted by positive affectivity (.14 versus −.06) under the covariance input free form measurement and method errors. These results provide support for H1.

Consistent with H2, the absolute strength of the indirect influence of negative affectivity on disengagement under both covariance input conditions (.29 and .16) is much higher than the indirect influence of positive affectivity (−.11 and −.10). The absolute indirect influence of negative affectivity on exhaustion is again more than twice the absolute magnitude of indirect influence exerted by positive affectivity (.29 versus −.11) under the covariance input free form measurement and method errors. These results collectively provide support for H2.

Conclusions

Our results show that employees high in negative affectivity have the tendency to perceive the work environment more political and such perceptions, in turn, lead to more exhaustion and disengagement. As explained by Schwarz (2000), affect plays a critical role in guiding one's cognitive processes and behaviors. Thus, employees with dispositions to experience negative affect have the tendency to examine environmental cues much more elaborately and exert a great deal of effort and energy to figure out what may be wrong. Such a systematic focus on details consumes one's psychological and physical resources and directly leads to exhaustion and disengagement from work. Hence, negative affectivity influences exhaustion and disengagement directly and indirectly through perceptions of organizational politics.

Our findings demonstrate that employees high in positive affectivity tend to have lower perceptions of organizational politics, which, in turn, lead to less exhaustion and disengagement. Positive affectivity also influences exhaustion and disengagement directly in addition to the intervening role of perceptions of organizational politics. Because of their general tendency to experience frequent positive moods, employees high in positive affectivity are not afraid of or threatened by the work environment. Employees with high positive affect engage in less elaborate assessments of environ-mental cues and less effortful information processing (George and Zhou, 2007). This tendency leads to lower perceptions of organizational politics which, in turn, results in lower levels of exhaustion and disengagement. Also employees high in positive affectivity do not have to consume as much psychological and physical resources to cope with organizational politics and consequently experience lower exhaustion and disengagement. These explanations are consis-

tent with the positive affect perspective advanced by Fredrickson and Losada (2005), who state that "because the broaden-and-build effects of positive affect accumulate and compound over time, positivity can transform individuals for the better, making them healthier, more socially integrated, knowledgeable, effective, and resilient".

Our findings also indicate that the indirect influences of negative affectivity on exhaustion and disengagement via perceptions of organizational politics are stronger than the indirect influences of positive affectivity. These results are congruent with the affect matching hypothesis which states that negative affectivity predicts perceptions of unpleasant events better and positive affectivity predicts perceptions of pleasant events (Valle et al., 2002). On a broader front, our results lend support to the work of Valle and Perréwe (2000), who investigated perceptions of organizational politics as a mediator of the effects of personality variables (e.g., Machiavellianism, external locus of control) on such outcomes as job satisfaction, job anxiety, and turnover intentions. They also partially corroborate Adams et al.'s (2008) findings, which have suggested that negative affectivity serves as an antecedent of perceptions of organizational politics, while positive affectivity best serves as a moderator in the perceptions of organizational politics-outcomes relationship.

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EFFECTS OF NEGATIVE INFORMATION ON TEAM IMAGE, FAN IDENTIFICATION, AND PURCHASE INTENTION AMONG CHINESE PROFESSIONAL BASEBALL LEAGUE FANS

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Abstract

Chinese Professional Baseball League (CPBL) had gone through several negative news caused tarnished image and the fans lost. The literatures review in past about negative information were focused on "gambling" and "baseball match-fixing" to effect on professional baseball club. However, the negative information also included the issues of sportsmanship and social ethic and morals. Thus, the aim of this study was to explore the effect of negative information on the team image, fans identification, and fans' purchase intention. The study used Questionnaire Survey to select CPBL's fans as research subjects recruiting the four game events in Taipei, Taichung, Tainan, and Kaohsiung based on "convenient sampling." This study was adopted questionnaire survey, receiving 432 effective questionnaires. As expected, the results found that the negative information of CPBL had the negative effect on team image and purchase intention; team image had the positive effect on the fans identification and purchase intention; fans identification had the positive effect on purchase intention. Finally, the research recommends that professional baseball club could be through record enhanced, creating star player, and enriching the content of sport event to enhance the team image as well as strengthen fans' team identification and purchase intention to the sport team.

Keywords: Chinese professional baseball league, Negative information, Team image, Fan identification

Introduction

The Chinese Professional Baseball League (CPBL), established in 1990, has operated for only 24 years. In the beginning, there were only four teams; by contrast, at the height of the industry in Taiwan, there were two leagues with 11 teams. During this period, the CPBL was subjected to several alleged incidents of match fixing and a "two Leagues." Despite the negative image of the league as well as that of the professional baseball clubs, the CPBL refused to discontinue operations. Liu (2006) indicated the CPBL endured a continuous stream of negative information since its fifth year of operation, during which the average number of spectators decreased from 5,000–6,000 to 2,000–3,000. Despite the two leagues merging, and Chinese Taipei having record success in the thirty-fourth session of the World Baseball Championship in 2001 that rejuvenated Taiwanese interest in professional baseball, negativity resurfaced and resulted in the dark age of Taiwan's professional baseball.

Previous studies about professional baseball have mostly focused on the image and loyalty of the fans toward the team (Jian and Li, 2011; Li et al. 2012), or team identification (Chang and Yao, 2010; Li, Wang and Nien, 2011). Few studies have explored the effect of negative information on the image of and identification with a professional baseball team. Moreover, current research related to the negative information has mostly focused on gambling and match-fixing scandals (Dai, 2005; Liang, 2011). However, the CPBL is currently receiving negative criticism regarding its sportsmanship, social ethics, and morals. Consequently, this study explored different concepts of negative information, considering their effect on team image, fan identification, and fan purchase intention in professional baseball. This study is expected to enable professional sports leagues and clubs to more clearly understand their fans' consumer behavior, and inform future business strategizing.

Literature Review

Negative Information

Weinberger and Romeo (1991) defined negative information as slander of people, products, or corporations. The information may originate from consumers, related groups, statutory bodies, or competitors. Negative information includes personal feelings, personal decisions, rumors, fears, product recalls, and negative advertisements. Sherrell and Reidenbach (1986) defined negative information as information that is destructive to a product, service, corporation, or individual through printing, rumor, reputation, or public information. Chang (2010) suggested that even when negative information comes from news reports about political, economic, and social illegalities or irregularities, it can still engender negative thoughts and result in a less than positive evaluation for an individual or organization.

Pulling (2006) divided negative information into the categories of performance-related and value-related information. Performance-related information pertains to functional benefits of products; value-related information pertains to social or ethical concerns, such as sexual harassment or racial discrimination. Both of these affect what a product symbolizes. Liu (2006) divided negative information for the CPBL into team-related, player-related, and institu-

tion-related information. Player-related information was further divided into doping, match fixing, and gambling; team-related information into sportsmanship, and players or coaches being fired without warning; and institution-related information into a poor record and dissolution, and negative information about the parent company.

Team Image

Team image is extended from the concept of brand image; there is not much difference between the two (Bauer et al., 2008; Jian and Li, 2011). Brand image involves the consumer's mental associations with the brand, as reflected in the relevant perception of the brand (Keller, 1993). It arises from a corporation's responses to the needs of consumers (Park et al., 1986). Nandan (2005) indicated that brand image is a consumer's associations with the product, including product function, product attributes, consumers' feelings toward the product, and the overall judgment of these emotional relationships. Farhat and Khan (2012) defined the brand image as the consumer's perception of the attributes and uniqueness of the product.

Peng and Chen (2009) divided the brand image of professional teams into association factors, management factors, and performance factors. Li et al. (2012) divided the image elements of CPBL teams into combat capability, commodity marketing, caring behavior, and value of identity. Fans' evaluation of combat capability and value of identity, which included team performance and players' attitudes in the game, tended to be positive. However, the elements of commodity marketing and caring behavior, which included player treatment, inhibiting players from joining a union, and low quality peripheral products, were rated lower. Jian and Li (2011) studied the image of baseball teams and identified four elements, including the team, the organization, and marketing. The team element included records, coaches, players, logo design, and venues; organization included team traditions, entertainment packages, opposing teams, product transfers, peripheral products, service quality, and image of the parent corporation; and marketing included media, support, and sponsor image.

Fan Identification

Han and Harms (2010) indicated that the concept of fan identification is evolved from organizational identity, and defined as whether the individual is considered part of their own community. Sutton (1997) indicated that fan identification is a personal, psychological commitment and entails emotional ownership of a team. Mael and Ashforth (1992) considered fan identification a spectator perception of the team as a whole, with the fans regarding the team's victory as their own personal experience. Wann et al.(2001) considered fan identification a psychological connection among fans, players, and teams. Luellen and Wann (2010) asserted that fan identification is the fans' feelings or emotions concerning their favorite team.

Funk and James (2006) suggested that positive image and belief produce symbols, function, and emotion for the fans, as well as transfer fan identification into an emotional response of liking the team. Moreover, young fans' sense of identification with the team is stronger than older fans' (Chang and Liu, 2012).

Purchase Intention

Schiffman and Kanuk (2004) claimed that purchase intention is an individually produced specific behavior of tendency and possibility for something, the major function of which is to evaluate the possibility that consumers will buy a commodity in the future. Dodds et al.(1991) found that a positive attitude toward a product strengthens purchase intention whereas a negative attitude weakens it. Moreover, they divided purchase intention into the following dimensions: the possibility of buying a product, agreeing with the price of product, whether to purchase a product according to the price, the chance of purchasing a product, and the degree of purchase intention. Baker et al.(1992) modified these dimensions to the possibility of staying in a store, the willingness to purchase from a store, and the willingness of recommending a store to friends and relatives.

Methods

Research Subjects

The research subjects were spectators in the twenty-fourth CPBL season. One hundred participants were selected for the pilot study administered at Taichung Baseball Stadium. Fans' home teams were considered when selecting the 100 spectators from each of the five Taiwanese stadiums (Taoyuan International Baseball Stadium, Taichung Baseball Stadium, Kaohsiung Cheng Ching Lake Baseball Stadium, Tainan Baseball Stadium, and Taipei Tianmu Baseball Stadium) for a total of 500 subjects.

Research Hypotheses And Frameworks

Negative information affects the image of a corporation and its products, as well as its relationship with consumers; thus, corporations should pay attention to negative information lest it affect business or advancement opportunities (Tao and Chang, 2008). When a company disseminates negative or irresponsible information, it affects the image of the company itself (Deshpande and Hitchon, 2002). When consumers receive negative information, it does not increase brand awareness; however, both positive information and negative information affect brand image (Berger et al., 2010). Given all of this, the first hypothesis of this study is the following:

H1: Negative information has a significant negative effect on team image.

Lin and Taylor (2009) indicated that negative information may influence consumers' identification with a company. Since consumers' identification depends on their feelings for a company, their perceptions, recognition, and emotions concerning the company are relevant. Because of the recent gambling scandals and match-fixing allegations, fans have been unhappy with the ethics of the CPBL and this has caused a decline in the number of spectators. In the shadow of the match-fixing scandal, there has been considerable tension and little vitality during the game. However, the CPBL handling of these scandals did not help to positively establish fans' identification with the team. Thus, fans transfer the commitment to their team or players to themselves. This leads to the second hypothesis of this study:

H2: Negative information has a significant negative effect on fan identification.

Kapferer (1997) claimed that brand identity comes from the business expressing itself to the public through a variety of symbol-laden messages. The brand image, however, results from consumers' interpretation of the symbols. Nandan (2005) observed that brand identity stems from an enterprise itself, reflecting its nature, whereas brand image represents a consumer's perception of a company. Brand image and brand identity are the interrelated elements of which a brand is built. Blombäck and Ramirez-Pasillas (2012) reported that a company's brand identity is emphasized through the dimensions of various functions, which further reproduce the company's brand image. Srivastava (2011) suggested that brand image and brand quality can enhance consumer loyalty, and that brand image can be attributed to consumers identifying with a product and decoding the message of a brand's characteristics. Starting with brand image and brand identity seems inconsistent, but these are necessary for establishing an effective brand, which in turn can engender customer identification. This leads to the third hypothesis of this study:

H3: A positive team image has a significant positive effect on fan identification.

Koh and Fang (2012) stated that consumers create their image of a company in light of previous consumption experiences, and this determines their purchase intentions. Wang (2005) indicated that the image characteristics for a professional team, including the team colors, mascot, and the performance of coaching staff, attract fans to watch the games. Tsai (2007) expressed that the team image can diminish for fans who are dissatisfied with the management, and along with it the willingness to watch games. This leads to the fourth hypothesis for this study:

H4: A positive team image has a significant positive effect on purchase intention.

Fans with strong identification still consider the cost of sports-related commodities before purchasing them (Li et al., 2011). Fans with strong identification were willing to make purchases to support their team. Thus, a company could develop team characteristics and brand image to achieve the effect of line stretching (Wang and Lin, 2007). Regardless of how fans watching the game (over a broadcast or at the stadium), it is important to strengthen fans' team identification if professional teams would like to increase fans' purchase intention. Kwon et al. (2008) indicated that fans who strongly identify with a team are more willing to go to the stadium to watch the game, buy peripheral products such as balls and jerseys, and promote the team's image as loyal fans. Madrigal (2001), on the basis of social identity theory, indicated that fans transfer the emotions felt for their team to peripheral products, and the purchase of peripheral products could strengthen fans' sense of belonging with the team. Luellen and Wann (2010) observed that fan identification could predict the number of fans viewing games at the stadium, broadcast ratings, radio ratings, and sponsors' goods. This leads to the fifth hypothesis of this study:

H5: Fan identification has a significant positive effect on purchase intention.

Consumers are influenced in their purchase decisions, positively or nega-

tively, by word of mouth when the message source has high credibility (Sussman and Siegal, 2003). Previous studies about negative information and consumer behavior have indicated that whether the negative information is true or not, it can affect consumers' purchase intention for the product (Dean, 2004). Professional sports provide a platform for competition and spectators encounter different types of situations that affect their willingness to watch a game. If spectators belong to a specific ethnic group, their willingness to buy tickets could be an important index of professional sports' success or failure (Greenwell et al. 2007). When fans do not trust the authenticity of a game, they are unwilling to watch that game at the stadium, even for their home team (Bruce and Tini, 2008). This leads to our sixth hypothesis: H6: Negative information has a significant negative effect on purchase intention.

Questionnaire

These instruments covered five sections: a negative information inventory, a fan identification inventory, a team image inventory, a purchase intention inventory, and a fans' background inventory. All items were scored using a 5-point Likert scale.

One hundred subjects were selected in each of the five CPBL stadiums for a total of 500 subjects, with 432 valid responses obtained. A majority of the 432 respondents providing valid samples were male (77.3%), were 21 to 40 years old (86.5%), had a college-level education (95.9%), and earned a monthly income lower than 30,000 NTD (69.9%).

Reliability and Validity of Research Instruments

This study used principal axis and orthogonal varimax rotations to extract the dimensions of negative information, team image, fan identification, and purchase intention, employing Cronbach's α to analyze the internal consistency of the survey. Hair et al. (2010) considered Cronbach's α = 0.60 to be the minimum acceptable value in social science research. The values of Cronbach's α across all dimensions of all inventories ranged from 0.620 to 0.701, which is in compliance with Hair's (2010) proposal.

Data Analysis

This study considered the effects of negative information, team image, fan identification, and purchase intention through regression analysis. The first regression model showed that negative information significantly and negatively affected team image (β = -0.204, p □ 0.000). If negative information is severe, there is a negative effect on team image; thus, Hypothesis 1 was verified. The second regression model presented no significant negative effect of negative information on fan identification (β = -0.094, p □ 0.05); thus, Hypothesis 2 was not verified. According to the third regression model, there was a significant positive effect of team image on fan identification (β = 0.522, p □ 0.000), which showed when team image was robust, fan identification was enhanced; thus, Hypothesis 3 was verified. The fourth regression model showed a significant positive effect of team image on purchase intention (β = 0.506, p □ 0.000); when team image was more robust, fans' purchase intention was enhanced; thus, Hypothesis 4 was verified.

Table 1. Result of regression analysis

Dimensions /Variables	β	R^2	Adj. R^2	T value	F	P value
Model 1: Negative information to Team image	-0.204***	0.041	0.039	-4.31	18.577	0.000
Model 2: Negative information to Fans identification	-0.094	0.009	0.007	-1.955	3.820	0.051
Model 3:Team image to Fans Identification	0.522***	0.272	0.271	12.689	161.011	0.000
Model 4:Team image to Purchase intention	0.506***	0.256	0.254	12.149	147.595	0.000
Model 5: Fans identification to Purchase intention	0.494***	0.244	0.242	11.778	138.728	0.000
Model 6: Negative information to Purchase intention	-0.112**	0.013	0.010	-2.242	5.487	0.020

P<0.05* ， P<0.01** ， P<0.001***

The fifth regression model showed that there was a significant positive effect of fan identification on purchase intention (β = 0.494, *p* □ 0.000): when fans' identification with the team was higher, their purchase intention was enhanced; thus, Hypothesis 5 was verified. The sixth regression model showed that negative information had a significant negative effect on purchase intention (β = -0.112, *p* □ 0.005); in the face of severely negative information, fans' purchase intention was lowered; thus, Hypothesis 6 was verified.

Conclusion and Commendations

The results show significant effects of negative information on team image and fans' purchase intention. When negative information is disseminated about a professional team, fans evaluate the team negatively and are less willing to go to the stadium and purchase peripheral products. However, negative information does not significantly influence team identity; no negative effect on fans' sense of team identification was observed. These results are similar to those of Dai (2005) and Bristow and Sebastian (2001), who found that fans' emotions about the teams they supported were not easily shaken. Today, CPBL game broadcasting enables fans to watch the game without going to the stadium, but being able to follow baseball tournaments over the Internet or television does not seem to affect fan interest. Hsieh (2012) found that despite negative information events about professional baseball, fans were still involved in related activities, creating a phenomenon of remote fans. Gate receipts are one of professional baseball's major sources of income; consequently, fans may use this fact to express their dissatisfaction with the league and

team while still watching games remotely.

This study found positive effects of team image on team identification and purchase intention: fan identification and purchase intention are enhanced when team image is more robust. This leads to three recommendations. First, teams should focus on their records, so that fans have a positive attitude and praise players' attitude toward the game (Bristow and Sebastian, 2001; Han and Harms, 2010; Li et al., 2012). As the team records improve, this can motivate die-hard fans to view games at the stadium as well as attract new fans. Second, a professional team should develop star players to increase its positive image (Funk and James, 2006; Jian and Li, 2011; Wang, 2005) and draw fans' attention. Finally, the team's own fighting spirit should make fans feel the team's hard work and focus (Funk and James, 2006; Horng and Chang, 2010; Peng and Chen, 2009). Presenting games with an exciting sense of tension lets fans enjoy the fighting spirit of players, and attracts fans to the stadium.

Limitations are inevitable in any study. This study used a modified version of Liu's Negative Information Questionnaire (2006). Because all participants were administered the questionnaire in the stadium, it is reasonable to assume that most of those who completed the survey were die-hard fans; future research should approach fans elsewhere to explore the effects of negative information on fans' purchase intention.

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COCREATION EXPERIENCES: A STRATEGIC APPROACH TO PRODUCT INNOVATION AND DESIGN

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Abstract

In the present study, NPD project managers in information and communications technology (ICT) industries were recruited as for two surveys. The ICT industry was selected because new products and services have a short life cycle in this industry. The proposed value cocreation (VCS) conceptual model was tested using survey data on the innovation, marketing, design, cocreation strategies they adopted and their subsequent NPD performance. NPD project managers in information and communications technology industries were approached to complete a two-stage questionnaire survey. The first survey investigated the VCSs they adopted for their marketing, innovation, and design activities. The valid respondents completed a second survey measuring their NPD performance after launching a new product. The primary findings of this study are summarized as follows: A VCS conceptual model was constructed to explain the effects of innovation, marketing, and design cocreation strategies on NPD performance. A qualitative comparative analysis was performed to examine which strategy configurations affected NPD performance and to explore any regular patterns in them.

Keywords: Value cocreation strategy (VCS), marketing, innovation, design, new product development (NPD)

Introduction

Enterprises endeavoring to create long-term competitive advantage must efficiently allocate their internal resources, pay attention to external stakeholders, and create, deliver, and manage customer value (Brashear et al., 2012; Ramirez, 1999). Ramaswamy and Gouillart (2010) empirically investigated business cases in the United States and determined that during new product development (NPD), enterprises tended to emphasize innovative value over product or service value. Value is derived from the outcomes cocreated through forming collaborative partnerships in the value chain, which provides a communication channel with consumers through the value cocreation process. In addition, enterprises can increase their market coverage by focusing on developing products and services through promoting interdepartmental collaboration as well as collaboration with internal and external stakeholders (Bhalla, 2010; Camarinha-Matos et al., 2009; Nataraajan and Angur, 2014).

A considerable volume of research has investigated methods for jointly developing products and services, efficiently integrating business design processes, and improving business performance (Andi and Minato, 2003). Several studies have suggested that NPD performance can be improved by controlling enterprise product design processes (Durward et al., 1998; Olson, 1994; Song et al., 1997). Product design is a critical value cocreation activity for enterprises and a crucial mechanism for integrating product development functions. Moreover, design is a critical component of the entire value chain (Aydin et al., 2007; Baxter, 1995; Fujimoto, 1991; Ge and Wang, 2007; Olins, 1990). When promoting product design, enterprises often require cooperation among and implementation at all business strategy levels to ensure that the overall business strategy is fulfilled (Mozota, 2006; Renee, 2007). Although Landwehr et al. (2013) and Griffith and Rubera (2014) proposed a relational model that illustrates the strategies for and implementations of product design, product marketing, and

innovation activities. However, empirical research on relational model and specific practices for marketing, innovation, design, and NPD is scant.

Accordingly, this proposed a model of a value cocreation strategy (VCS) for analyzing how enterprises adopt innovative, marketing, and design strategies to achieve their performance goals through cocreation.

In the present study, NPD project managers in information and communications technology (ICT) industries were recruited as for two surveys. The ICT industry was selected because new products and services have a short life cycle in this industry. The proposed VCS conceptual model was tested using survey data on the innovation, marketing, design, cocreation strategies they adopted and their subsequent NPD performance. In addition, the proposed VCS model exhibited a favorable fit to the survey data, and the effects of the VCS model variables on NPD performance were subsequently analyzed. Finally, various strategy configurations derived from the VCS model were summarized, and their effects on NPD performance were compared.

Literature Review

Cocreation

Traditional management scholars have examined value creation according to the precondition that enterprises are the creators of value. In an empirical case in the United States, Ramaswamy and Gouillart (2010) determined that, to enterprises, innovation value is more critical than product or service value when developing new products. The value originates from the outcomes of collaboration and the experience gained by all partners in the value chain. Thus, enterprises continually communicate with consumers through the process of value cocreation and develop products and services through collaboration with various departments in order to increase market share (Bhalla, 2010; Camarinha-Matos et al., 2009). Based on Camarinha-Matos et al. (2009); Bhalla (2010); Komulainen (2014); Leticia Santos-Vijande et al., 2013; Prahalad & Ramaswamy (2004) , the current study derived four cocreation dimensions, as follows: emphasized the importance of

customer opinions (CS1) "applying customer intellectual capital (CS2) "customer participation (CS3), and rapidly responding to customers.

NPD Performance

Driva et al. (2000) examined the manufacturing industry and proposed five NPD performance measurement indicators: total project costs and the differences between actual and projected costs, completion time, product launch date, and project completion date. Leenders and Wierenga (2002) indicated that NPD performance comprised NPD decision-making speed, NPD decision-making quality, NPD speed, commitment to NPD decisions converted into actions, NPD cost efficiency, and capacity to respond to new opportunities. Ulrich and Eppinger (2004) and Ciriaco et al. (2010) have proposed five dimensions for the performance indicators of product development: product quality, product cost, development time, development cost, and development ability. In addition, these scholars have emphasized nonfinancial performance indicators including enhanced product quality, customer familiarity with products, and corporate image. For the present study, the discussed NPD performance measurement indicators were classified into financial and nonfinancial indicators, from which six performance indicators were derived: Financial indicators: sales volume (NP1), sales amount (NP2), and profits (NP3). Nonfinancial indicators: enhanced corporate technology competence (NP4), improved corporate image (NP5), and customer product evaluations (NP6).

Marketing

Armstrong and Kotler (2003) reported that marketing strategies are formulated to guide enterprises through allocating resources to meet target customer needs more effectively and efficiently than competitors can. Cravens et al. (1999) claimed that marketing strategies include branding, low-cost, channel, and innovation strategies. The term innovation strategy implies a close relationship between marketing strategies and product innovation. In addition, scholars have proposed various arguments about which marketing strategies are more effective. However, among all research

perspectives, the marketing mix, which comprises the dimensions of product, price, place, and promotion, is arguably the most frequently used tool for explaining marketing strategy types (Kotler, 1997). Following the logic of previous studies (Eleri and Robert, 2007; Hughes and Morgan, 2007; Kotler, 1997; Perreault and McCarthy, 2003), the present study classified the marketing mix variables into four primary strategy dimensions: product (MS1), price (MS2), channel (place; MS3), and promotion (MS4).

Innovation

Innovation strategies refer to strategies in which enterprises create an environment that is conducive to innovation. Enterprises can differentiate from their competitors by ensure that their products and services are unique (Schuler and Jackson, 1987). In the current study, innovation strategies were classified according to the following three strategic dimensions: Technological innovation, Business model innovation, and Management innovation. Accordingly, in the present study, innovation strategies were divided into technology (IS1), business model (IS2), and management (IS3) strategy dimensions.

Design

Design strategies are effectively overall business strategy guidelines for designing new products (Crawford, 1994). Design strategies critically affect an enterprise's competitiveness and effectively establish a communication channel between upstream and downstream partners in the value chain (Hua et al., 2011). In specifying the goal of design strategies, Mozota (2003) cited three fundamental strategies (i.e., design for cost, design for image, and design for focus) based on the competitive strategies proposed by Porter (1980). In addition, Kelley (1992) analyzed successful product cases and proposed 12 strategic design factors. Sung and You (1999) claimed that design strategies belong to the actual responses of organizational design innovation activities. Integrating the strategic design factors proposed by Kelley (1992), they produced 10 product design factors and defined product design strate-

gies as decision-making processes aimed at achieving product design goals and deriving unique competitive advantages in design. Thus, design strategies effectively provide a pathway to achieving product innovation goals. When customer needs and competitor influences are analyzed in combination with an enterprise's core R&D abilities, design teams can execute design strategies to achieve the performance goals of the enterprise (Hill et al., 2014; Simoni et al., 2014). In the current study, the design strategy perspectives of Mozota (2003) and Kelley (1992) were adopted to divide product design strategies into the following dimensions: strengthen R&D capacity (DS1), reduce production costs (DS2), ensure product quality (DS3), and promote enterprise image (DS4).

Research Methods

Pretest Questionnaire Survey

To develop a pretest questionnaire, a focus group interview was conducted to determine the research participants, scope, and relationship among the proposed research dimensions. Seven experts (four product design managers and three design scholars) were invited to discuss some relevant preliminary cases and the structure of the proposed conceptual model. The experts ascertained that the measurement variables extracted from the literature were suitable for the current study, and the pretest questionnaires were administered. Respondents indicated their level of agreement with each item in the questionnaire by using a 5-point Likert scale ranging from 1 (Never or do not agree at all) to 5 (Always or totally agree). For the pretest questionnaire survey, 200 NPD project managers were randomly selected from the Taiwan Electrical and Electronic Manufacturers' Association (TEEMA) database, and 42 questionnaires were recovered. A factor analysis and reliability analysis were conducted to verify the construct validity and questionnaire reliability. The results showed that the meaning of all the variables could be fully explained according to the extracted factors, indicating that the constructs were valid. The cocreation strategy (CS), marketing strategy (MS), innovation strategy (IS), and design strategy (DS) variables significantly and positively correlated with

NPD performance (NP; Pearson correlation coefficient = 0.897, $p < .01$). In addition, all items attained Cronbach's α values higher than 0.8, demonstrating adequate reliability. Accordingly, a formal questionnaire survey was conducted using the validated questionnaire constructs.

Formal Questionnaire Survey

From the TEEMA database, 1,000 enterprises were randomly sampled for the two formal surveys. After repeated follow-up tracks, valid questionnaires were retrieved from 295 enterprises for the first survey. After a new product launch period of 18 months, the enterprises that responded to the first survey were surveyed a second time to obtain data on their NP, from which 256 valid questionnaires were recovered, yielding a 25.6% effective recovery rate.

This study adopted the partial least squares (PLS) method, which is an analysis technique for constructing and examining predictive models, particularly causal relationships between latent variables. The PLS method is superior to common linear structural relations models and widely used in the fields of management and marketing (Chen and Su, 2011; Dawes et al., 2007; Law and Ngai, 2008; Qureshi and Compeau, 2009).

The PLS method was adopted because (a) it can include multiple dependent and multiple independent variables, (b) it can be used to control multicollinearity among independent variables, (c) it maintains robustness, even with noisy or missing data, (d) it can be used to perform strong predictions for independent latent variables based on response variables, (e) it allows for reflective and formative latent variables, (f) it can be applied to small samples, and (g) it is not subject to distributional constraints (Pirouz, 2006). Bootstrapping was performed 1,000 times on the questionnaire data to estimate and infer the parameters.

Qualitative Comparative Analysis

After the VCS conceptual model was verified, the strategy configurations contributing to high and low NPD performance were investi-

gated to identify any regular patterns in them. Accordingly, following Fiss (2007, 2011), a fuzzy set qualitative comparative analysis (QCA) was conducted to explore the relationships among the strategy configurations by using fsQCA Version 2.0 (Drass and Ragin, 1999). In addition, Boolean algebra was employed to refine the strategy configurations and adopted set relations and logical computation rules among the set to enable investigating the strategy configurations (Ordanini et al., 2014).

Table 1. Truth Table indicating NPD Performance Results Generated by Conditions

MS	IS	DS	CS	FS	BT	NP	Cases	%	Raw	Sym
1	1	1	1	1	1	1	10	4.28	.916	.782
1	1	0	1	0	1	1	5	3.19	.914	.784
0	0	0	0	1	1	1	5	2.08	.913	.807
1	0	0	1	1	1	1	38	13.74	.895	.801
1	1	1	1	1	1	1	12	6.13	.876	.863
1	1	0	1	1	0	1	6	2.49	.867	.836
0	0	1	0	1	1	1	4	2.56	.865	.804
0	1	1	1	0	0	1	27	10.51	.864	.796
1	1	1	0	1	1	1	5	3.05	.860	.756
1	0	1	0	0	1	1	3	1.27	.856	.758
0	0	0	0	0	1	1	23	10.07	.843	.785
1	0	0	1	1	0	1	4	1.56	.841	.782
1	0	0	0	1	0	1	5	1.89	.839	.773
0	0	1	0	1	0	1	3	2.13	.834	.795
0	0	0	1	1	0	1	31	11.28	.82	.792

Development Of Set-Membership Measures

To implement the fuzzy set QCA method, the variables were transformed into sets calibrated according to three thresholds: fully-in membership, fully-out membership, and neither fully in nor fully out membership (Ragin, 2008). After the thresholds were confirmed, fsQCA was employed to confirm calibration completion. In this study, a 5-point Likert scale was employed to measure the independent variables following the method for treating continuous variables proposed by Fiss (2007) and Ragin (2008); subsequently, the responses of 1 (Never or do not agree at all), 3 (Maybe), and 5 (Always or totally agree) were recoded

as “fully out” (membership = 0), “neither fully in nor fully out” (membership = 3), and fully in (membership = 1), respectively.

Property Space

QCA starts by defining the property space, which consists of all of the possible configurations of conditions leading to an outcome of interest. Because the property space delimits the potential explanations of the outcome, the conditions should be carefully chosen and theoretically grounded (Ordanini et al., 2014). To analyze the relationships and influences of firm size (FS) and business type (BT) in each configuration, the present study investigated the following six conditions and outcomes of NPD performance: IS, MS, DS, CS, FS, and BT. A total of 64 combinations of the condition variables were obtained (i.e., 26 = 64 combinations).

Following the methods employed by Fiss (2011) and Ragin (2008), the present study excluded the combinations involving fewer than three samples and with a raw consist smaller than 0.8. Finally, Table 1 shows the 15 combinations and 181 samples that were obtained through this process. In the table, the strategy configurations are presented as rows.

Data Analysis And Results

Table 2 lists the means, standard deviations (SDs), average variance extracted (AVE) squared, and a correlation matrix of the primary dimensions (i.e., MS, IS, DS, CS, NP, FS, and BT). Table 3 shows the standardized loading, composite reliability, and AVE of all factor dimensions. The composite reliability values of all the primary dimensions are 0.897 (MS), 0.881 (IS), 0.921 (DS), 0.897 (CS), and 0.901 (NP).

The overall composite relatability is 0.899, which is higher than the standard value of 0.70 recommended by Hulland (1999), indicating that the model demonstrates adequate internal consistency. In addition, the AVEs of the primary dimensions are 0.879 (MS), 0.866 (IS), 0.897 (DS), 0.884 (CS), and 0.876 (NP). The overall AVE is 0.884, which is higher than the

Table 2. A correlation matrix and AVE squared for all items

	Mean	Sd	MS	IS	DS	CS	NP	FS	BT
MS	3.916	.265	(.767)						
IS	4.139	.513	.834	(.759)					
DS	4.019	.321	.792	.851	(.801)				
CS	3.374	.236	.773	.867	.818	(.768)			
NP	4.382	.413	.836	.901	.793	.802	(.786)		
FS	4.505	.216	.785	.841	.873	.852	.810	(.831)	
BT	3.683	.389	.716	.823	.861	.799	.771	.813	(.765)

Notes: MS: Marketing strategy; IS: Innovation strategy; DC: Design strategy; CS: Co-creating strategy; NP: New Product Development Performance; ( ): AVE^2; SI: Size; BT: Business type.

Table 3. Accuracy analysis statistics

Core	Item	*CL*MS	*CL*IS	*CL*DS	*CL*CS	*CL*NP	Alpha	SL	CR	AVE
MS	*MS1*	*.923*	.868	.882	.813	.845	.894	.965	.912	.879
	MS2	*.862*	.854	.846	.793	.827				
	MS3	*.912*	.899	.837	.797	.861				
	MS4	*.916*	.883	.875	.821	.851				
IS	*IS1*	.852	*.861*	.804	.816	.835	.872	.969	.904	.866
	IS2	.837	*.905*	.841	.823	.856				
	IS3	.849	*.859*	.832	.813	.798				
DS	*DS1*	.927	.931	*.969*	.912	.944	.858	.875	.868	.897
	DS2	.924	.936	*.953*	.903	.918				
	DS3	.918	.948	*.967*	.916	.931				
	DS4	.924	.916	*.972*	.907	.941				
CS	*CS1*	.813	.847	.849	*.851*	.787	.883	.844	.899	.884
	CS2	.785	.827	.793	*.841*	.823				
	CS3	.833	.819	.788	*.837*	.798				
	CS4	.825	.833	.796	*.847*	.781				
NP	*NP1*	.944	.929	.962	.967	*.975*	.901	.903	.895	.876
	NP2	.925	.958	.918	.915	*.963*				
	NP3	.943	.931	.924	.938	*.951*				
	NP4	.944	.948	.965	.941	*.977*				
	NP5	.941	.912	.953	.945	*.963*				
	NP6	.951	.963	.927	.943	*.983*				

Notes: CL: cross loadings; SL: standardized loading; CR: composite reliability; AVE: average variance extracted.

0.5 standard value recommended by Fornell and Larcker (1981).

Strategy Configuration for Achieving High NPD Performance

To examine which strategy configurations produce high NP, this study followed the notation method of Ragin and Fiss (2008). The results shown in Table 1 were obtained using

Boolean algebra. The black circles ("●") represent the presence of a causal condition, the hollow circles with a cross in the center ("⊗") represent the absence of a causal condition, and the blank spaces indicate that a causal condition may exist but has no significant effect on the result. In addition, the large and small font sizes indicate core and peripheral conditions, respectively. Table 4 provides the results.

Table 4 presents the six types of casual path configurations (1, 2, 3a, 3b, 4, 5), with a solution coverage of 0.451, thus indicating that these casual paths account for 45.1% of the research sample. Following is a summary of the analysis of the causal paths in Table 4:

(1) MS contributed to high NP in Configurations 1, 2, 3b, and 5. When MS is employed to elevate NP, the other measures must be coordinated with the MS. For example, in Configurations 1, 2, and 3b, both IS and DS must be present. This finding is similar to the viewpoints suggested by Armstrong and Kotler (2003), whom indicated that MSs guide enterprises to use their resources efficiently, under the assumption that they can satisfy market demands more effectively than their competitors can, thereby achieving their marketing objectives.

Table 4: High NP configurations

	Solution					
Configurations	1	2	3a	3b	4	5
Marketing strategy	●	●		●	⊗	•
Innovation strategy	●	●	●	●	•	⊗
Design strategy	•	•	●	•	●	●
Co-creation strategy	⊗	•	•	•	●	
Firm Size	⊗	⊗	•	•	⊗	⊗
Business type	•	●	⊗	⊗	⊗	•
Raw Coverage	.26	.27	.28	.21	.28	.29
Unique Coverage	.00	.02	.01	.03	.02	.01
Consistency	.80	.81	.80	.80	.81	.80
Solution Coverage	.451					
Solution Consistency	.798					

(2) IS contributed significantly to high NP. Among the six configurations, IS is absent only from Configuration 5. Adopting IS to elevate NP in Configurations 1, 2, 3a, 3b, and 4 would require DS and IS objectives to be coordinated. This finding indicates that to successfully develop new products, an enterprise must coordinate its IS and DS objectives (Dell'Era and Verganti, 2007; Mozota,

2006; Sari et al., 2007; Sung and Gilmour, 2002).

(3) DS contributed significantly to high NP and is present in all six configurations, indicating that DS and NP are closely related (Cooper and Kleinschmidt, 1987; Souder and Song, 1997; Ulrich and Person, 1998) and that the extent an enterprise invests in product design may be reflected in its NP (Pawer and Driva, 1999; Driva et al., 2000). For Configurations 2, 3a, 3b, and 4, if an enterprise sought to elevate its NP through executing a DS, then its IS and CS objectives must be coordinated with its DS objectives.

(4) CS was limited in its contribution to high NP. Among the six configurations, CS is present in Combinations 2, 3a, 3b, and 4. If an enterprise employed a CS to elevate its NP under Configurations 2, 3a, 3b, and 4, then its IS and DS objectives must be coordinated with its CS objectives. This finding is in agreement with the viewpoints proposed by Camarinha-Matos et al. (2009) and Bhalla (2010), whom indicated that value is cocreated through collaborative partnerships in the value chain. In addition, collaboration among various departments, suppliers, employees, and other interested parties is necessary to improve market coverage.

(5) Neither FS nor BT contributed significantly to high NP. FS is present only in Configurations 3a and 3b, and BT is present only in Configurations 1, 2, and 5.

Strategy Configurations Leading to Low NP

This study adopted the method proposed by Ragin and Fiss (2008) to examine which strategy configurations resulted in low NP. The results in Table 1 were processed using Boolean algebra, yielding results as shown in Table 5, which presents the five types of casual path configurations (i.e., 1, 2a, 2b, 3, 4). The solution coverage of 0.434 indicates that these five configurations account for 42.1% of the research sample. Following is a summary of the analysis of the causal paths in Table 5:

(1) MS was limited in its contribution to low NP and is present only in Configurations 3 and 4.

(2) IS contributed significantly to low NP and is present in Configurations 1, 2a, 2b, and 3. This finding suggests that the appropriateness of IS planning and execution is a critical factor contributing to low NP.

Table 5: Low NP configurations

	Solution				
Configurations	1a	2a	2b	3	4
Marketing strategy	⊗	⊗	⊗	●	•
Innovation strategy	●	●	•	●	⊗
Design strategy	●		⊗	●	
Co-creation strategy	•	●	●	•	●
Firm Size	•	•	●	⊗	⊗
Business type	⊗	•	•	●	•
Raw Coverage	.279	.234	.243	.216	.203
Unique Coverage	.017	.026	.008	.014	.020
Consistency	.807	.801	.811	.803	.806
Solution Coverage	.434				
Solution Consistency	.802				

(3) DS was limited in its contribution to low NP and is present in Configurations 1a and 3.

(4) CS contributed significantly to low NP and is present in all five configurations, indicating that the appropriateness of CS execution (e.g., emphasize the importance of customer opinions, applying customer intellectual capital, enhancing customer participation, and rapidly responding to customers) was the main cause of low NPD performance.

(5) FS contributed significantly to low NP and is present in Configurations 1, 2a, and 2b, thus implying that the appropriateness of FS-related factors was the primary cause of low NP. Such factors include the number of employees, amount of capital, and business revenue.

(6) BT contributed significantly to low NP and is present in Configurations 2a, 2b, 3, and 4, indicating that whether appropriate BS-based MS (using own-brand products or products produced under original equipment manufacturer [OEM] license) is selected was the influential factors contributing to low NP.

Conclusion

Previous studies have considered design activities and strategies as the integrated resources of enterprises and a product integration mechanism in the entire innovation value chain (Baxter, 1995; Bruce and Jevanker,

1998; Fujimoto, 1991; Olins, 1990; Twigg, 1998; Wheelwright and Clark, 1992). However, most of these studies were cases or individual conceptual interpretations that were not adequately grounded in theory. The current study validated the relationships among these matters, particularly among MS, IS, DS, and CS. The survey respondents were NPD project managers that had rapidly launched new products or services to replace existing products or services. Based on the IS, MS, DS, CS, and NP data, this study proposed a VCS model. In addition, survey data achieved a favorable fit to the VCS model, validating the applicability of the proposed model.

A total six types of causal path configurations resulted in high NP, accounting for 44.5% of the sample. Among the various configurations, the effects of MS, IS, and DS were statistically significant; by contrast, the effects of CS, FS, and BT were nonsignificant. These findings accord with the viewpoints suggested by Camarinha-Matos et al. (2009) and Bhalla (2010), whom indicated that cocreated value derives from forming collaborative partnerships in the value chain. In addition, collaborations among various corporate departments (e.g., marketing, R&D, and design departments), suppliers, employees, and other interested parties were necessary conditions for increasing market coverage.

In total, five types of causal path configurations contributed to low NP, accounting for 42.1% of the sample. Among the various configurations, IS, CS, FS, and BT had significant effects; by contrast, no significant effect was exerted by MS or DS. These findings indicate that whether the following methods were appropriately executed was an influential factor contributing to low NP: satisfying customer needs, increasing operation efficiency, continuing service innovation, and responding rapidly to market changes. We determined that value cocreation was a crucial factor influencing the relationship between enterprise internal resources and profit performance. From the perspective of customer value theory, enterprises must understand the characteristics of the products and services that customers truly need by examining their customers' views

and values, as well as the ultimate goals for and outcomes of their products and services. Enterprises can create value by the process of learning, creating, and delivering customer value (Brashear et al., 2012; Hakola, 2013; Ulkuniemi et al., 2011; Woodruff, 1997). Customer value perspectives can elucidate how customers contemplate and perceive the interactive relationship between products/services and profits/losses, thereby revealing the processes customers adopt when evaluating product functions, services, relationship benefits, monetary benefits, and nonfinancial losses (Blocker & Flint, 2007; Rundh, 2011; Flint, 2004). Accordingly, to derive competitive advantages, enterprises must first focus on customer value perspectives and subsequently develop a series of customer value activities.

The results indicate that the cocreation strategies influenced and mediated its relationship with NPD performance and that different combinations of casual paths lead to different NPD performance outcomes, indicating that when enterprises support and adopt a VCS, their innovation, marketing, and design activities have an increasingly significant influence on their NPD performance. Therefore, an enterprise's capacity for product innovation, marketing, and design can elevate its NPD performance; in addition, adequately incorporating the following core perspectives of value cocreation can improve NPD performance substantially: customer opinions, customer interaction, and customer participation. The findings of this study can enhance the results of previous studies (Claudio and Roberto, 2007; Gupta et al., 1985; Souder, 1987; Li and Atuahene-Gima, 2001; Maidique and Zirger, 1984; Mozota, 2006; Ritala et al., 2013; Ritala and Huizingh, 2014; Sari et al., 2007; Sung and Gilmour, 2002).

Under an open economic system, satisfying customers should be the top priority of enterprises. Similar to the concept of the power school proposed by Mintzberg et al. (2005), perhaps the decisions on resource allocation in an organization are derived from integrating and compromising on various personal ideas and benefits; in addition, regarding the processes in the external environment that ensure or-

ganizational survival, establishing networks and strategic alliances may involve factors that sometimes embed more strategic significance than focusing on satisfying customers would.

Accordingly, firms are pleased when their managers successfully motivate engineering designers to willingly engage in team cooperation. Nevertheless, whether the compatibility of firm goals and visions with the work philosophy of designers can assist firms in achieving this management outcome, and the reasons behind such cooperation, remain unclear; it is these questions that motivated and guided this study. In short, this study identified several mediators to explain how and why the relationships between designers and hiring firms affect designer team cooperation. Furthermore, a design cocreation strategies on NPD performance was proposed to not only theoretically explain the relationships between marketing, innovation, and team cooperation strategy, but also provide feasible strategies for firms and managers to inspire team cooperation among designers.

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