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UTILIZATION OF CLOUD COMPUTING APP FOR HOMESTAY OPERATION – DESIGN AND ANALYSIS

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Abstract

A cloud computing APP for homestay operators of Taiwan has been designed by the study. The prevalent DeLone & McLean information system (IS) success model was used as foundations to the five measures of IS success model based by the study. Seven hypotheses were proposed relating to each of the five measures, "system quality", "information quality", "intention to use", "user satisfaction", and "net benefits". A questionnaire consisted of 26 items was used to grade each of the five measures of the constructed cloud computing APP. Respondents of the internet survey indicated that they were more satisfied with "system quality" and "information quality" of the constructed APP. Although still satisfied with the APP, "user satisfaction" received the lowest mean score, at 3.73 out of the five-point Likert scale. Of the proposed hypotheses, three statistically validated hypotheses are: "information quality positively affects intention to use"; "system quality positively affects user satisfaction"; and "information quality positively affects user satisfaction".

Keywords: cloud computing, homestay, IS success model, service APP

Introduction

Ever since the implementation of full off-days on Saturdays, the policy of two off-days per week has contributed to the growth of tourism/hospitality related businesses. With more people seeking leisure and/or recreational opportunities away from home during weekends, the demand of lodging varieties has increased as well. Diverse populations from Hakka and aborigines make organizational network of culture tourism realizable in rural areas (Saeng-Ngam et al., 2009). A unique industry in Taiwan, called "minshu" in Mandarin, offers guest stays in rural areas where tourists have more opportunities to experience

the natural and local gusto. The term "min-shu" came from the Japanese-style bed and breakfast (B&B), "min-shuku", which is the equivalent of "home stay" or "hostel" in America or "B&B" in Britain. Generally, homestay enhances tourism facilities in a country for ecotourism, rural tourism, and cultural tourism that may not be solved through traditional means of accommodation such as hotel, motel, lodging, and camping (Bhuiyan et al. et al., 2013). Unlike typical hotels, homestay is frequently family oriented with limited manpower. With advanced wireless technology, the study seeks to shorten the lacked manpower by designing a cloud computing platform of information technology (IT) for homestay operation.

Cloud computing is internet protocol (IP) based high development and integration of computer technology. In general, cloud computing is broadly divided into three categories: Infrastructure-as-a- Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS). Cloud computing may also be divided into five layers including "client", "application", "platform", "infrastructure", and "server" to look more reasonable and clearer than the three categories. Human – computer interaction is an important criterion of a successful "application", as well as ease use user experience characteristic (Gong et al., 2010).

The popular APP is the short of "application" which is a type of software in smart phones used by many in their everyday life. Unfortunately, the current operation system (OS) is not uniform across all smart phones. It is similar to the non-compatibility between Microsoft Windows and Apples where the App in Yahoo can not be installed and used in Apple's *i*OS unless compatible *i*OS is developed in Mac. Mobil phones work the same way as in computers where compatible APP developed may be used across all smart phones.

The study seeks to design a cloud computing APP in smart phones for homestay operation. The cloud computing APP is a concept of distributed computing model where dynamic services may be provided to users of the APP from sent data via virtual computing support. The APP would bring convenience to both consumers and homestay businesses. Survey would be used as basis of evaluation, conclusion, and recommendation. The objectives of this study are summarized as follows. (1) To construct a cloud computing APP for homestay businesses. (2) Designed graphics are user- friendly for easier operation. (3) Established APP shortens the communicating distance via faster data transfer. (4) Faster transfer of information reduces consumers' waiting time. (5) Competitiveness of homestay businesses is enhanced by the constructed cloud computing APP.

Literature Review

Although Vaquero et al. (2009) had listed 22 definitions and provided comprehensive analysis of cloud computing characteristics, the term "cloud computing" may have been inspired by the cloud image often used to represent internet flowcharts or diagrams. It is a large pool of virtualized resources that are ease to use while enabling on-demand network access to a shared pool of computing resources that is fully managed by the provider. As an example, Chieu et al. (2010) had previously designed and implemented a cloud-based demand driven business analytic solution of platform for cross enterprise improvements. Also, studies had identified 10 characteristics of cloud

computing: “user friendliness”, “virtualization”, “internet centric”, “variety of resources”, “automatic adaptation”, “scalability”, “resource optimization”, “pay per use”, “service SLAs (service-level agreements)”, and “infrastructure SLAs” (Buyya et al., 2009; Geelan, 2008).

Based on the communications research of Shannon and Weaver (1949) and the information “influence” theory of Mason (1978), DeLone and McLean (1992) proposed Information Systems (IS) Success Model for measuring the complex-dependent variable in IS research. As shown in Figure 1, there are six aspects in the DeLone & McLean IS Success Model in which “system quality” and “information quality” influence “use” and “user satisfaction” of the information system. Not only do “use” and “user satisfaction” mutually influence each other, they also influences “individual impact” and sequentially the “organizational impact”. Later, Pit et al. (1995) and Myers et al. (1997) proposed an additional aspect, the “service quality”, in addition to “system quality” and “information quality” of the DeLone & Mc-Lean IS Success Model. Then, Seddon (1997) proposed an additional measure, the “society” in addition to “individuals” and “organizations” in IS use, which may have served as a precursor to the Updated IS Success Model by DeLone and McLean (2003). There were three major modifications to the DeLone and McLean Updated IS Success Model. First, “service quality” was added to “system quality” and “information quality”. Second, the aspect of “Use” was defined more specifically to “intention to use” and “use”. Finally, “net benefits” replaced “individual impact” and “organizational impact” for the inclusion of “society impact”, as shown in Figure 2.

Methodology

From literature review, the study constructed the following hypotheses regarding cloud computing APP system for homestay operators of Taiwan.

H1: System quality positively affects intention to use.
H2: Information quality positively affects intention to use.
H3: System quality positively affects user satisfaction.
H4: Information quality positively affects user satisfaction.
H5: User satisfaction positively affects intention to use.
H6: Intention to use positively affects net benefits.
H7: User satisfaction positively affects net benefits.

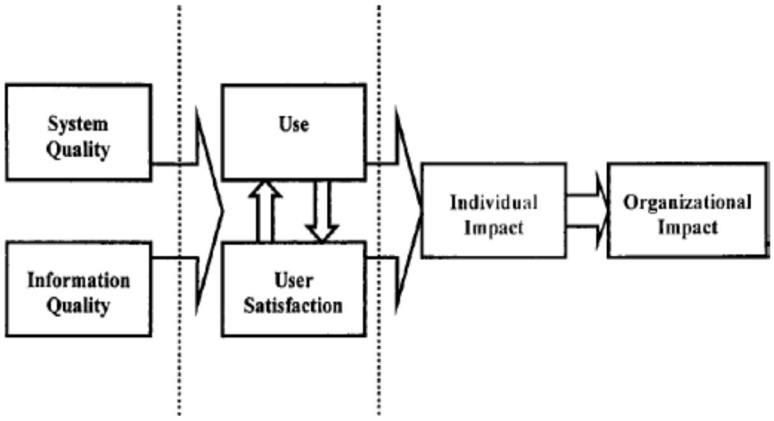

Figure 1. DeLone & McLean (1992) IS success model

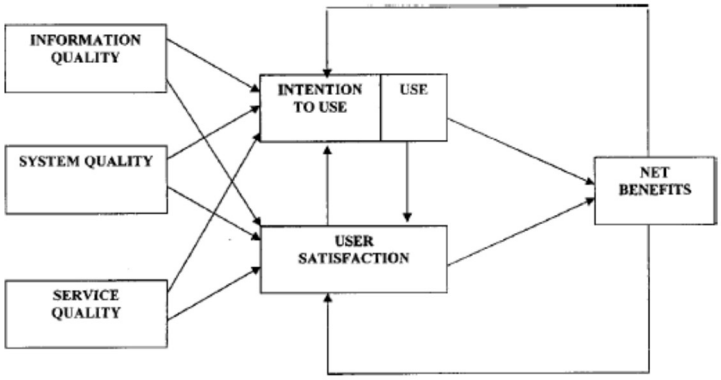

Figure 2. Updated DeLone & McLean (2003) IS success model

The construct was derived from the DeLone & McLean (2003) updated IS success model, as shown in Figure 3. Since survey would be taken on respondents who had just experienced cloud computing APP system for homestay operators, exclusion of "service quality" takes place because it is not applicable for the study. "Service quality" applies more toward long haul maintenance of the cloud computing APP system. From the hypotheses, a questionnaire was developed which consists 26 items concerning operation of cloud computing APP for homestay businesses of Taiwan. Then, subsequent survey and data analysis would follow.

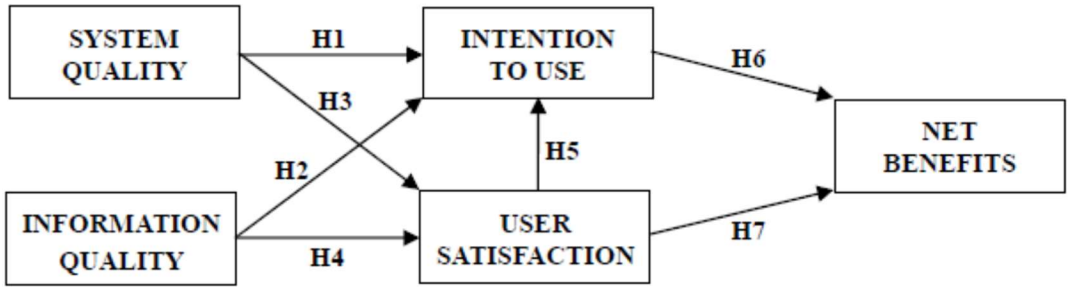

Figure 3. Research construct of cloud computing APP for homestay operation

The research team developed a cloud computing APP for homestay ("min-shu") operators of Taiwan. Primarily, the developed APP provides services to consumers and bridges communication between travel agencies and homestay businesses. As shown in Figure 4, potential consumers may use their smart phones or tablet computer (e.g. *i*Pad, Android devices) to choose a prospective homestay that fits their needs. Then, the established 3G web connects to the prospective homestay cloud computing APP environment, followed by security mechanism (i.e. certification). Data from consumers' inputs are sent to cloud computing (IaaS, PaaS, and SaaS) which redirects to the service platform of the prospective homestay. In turn, consumers see information of the prospective ho-

mestay on their smart phone or tablet computer which saves time and effective integration of travel agencies and homestay

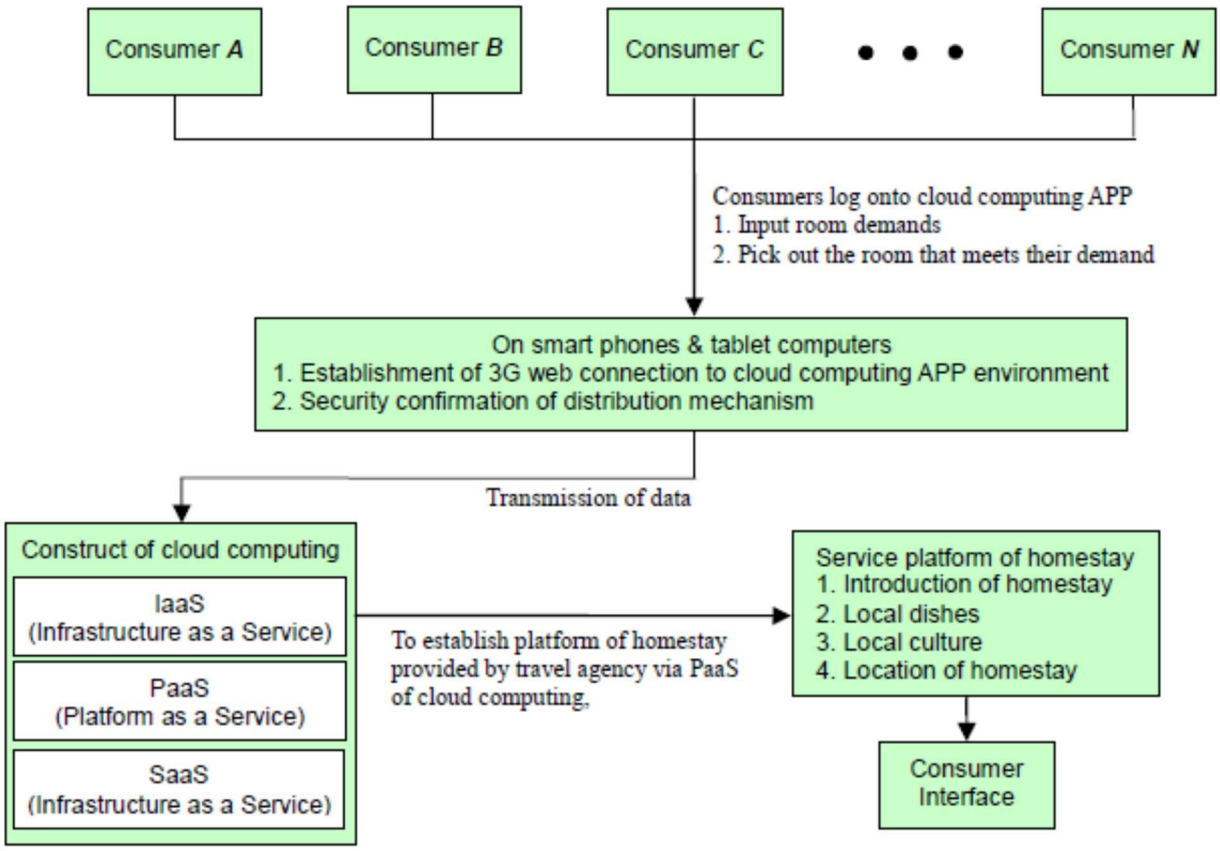

Figure 4. Construct of the APP on homestay operation

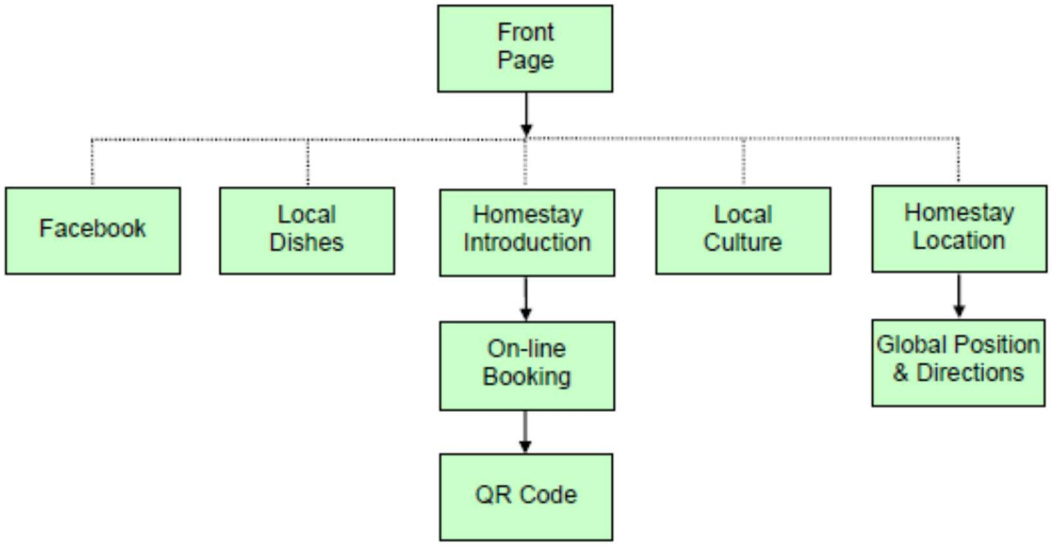

Figure 5. APP functions of homestay remote booking

Figure 6. The developed APP platform on http://www.cmoremap.com.tw/

businesses. Finally, functions of the APP developed by the study for remote booking of homestay are shown in Figure 5.Internet survey was taken on 150 consumers who had used the APP platform services of http://www.cmoremap.com.tw/, as shown in Figure 6. There were five constructs in the questionnaire which included a total of 26 items under "system quality", "information quality", "intend to use", "user satisfaction", and "net benefits". Each item was rated on a five-point Likert-type scale, 1 = strongly disagree, 2 = tend to disagree, 3 = neutral, 4 = tend to agree, and 5 = strongly agree. Items relating to gender, age, occupation, education level, and income level were included for analysis of respondents'

Table 1. Demographic characteristics of the respondents

Demographic Characteristic	Number of Respondents	Percentage of Respondents
Gender		
Male	70	46.7
Female	80	53.3
Age		
25 or under	48	32.0
26 – 30	48	32.0
31 – 35	19	12.7
36 – 40	17	11.3
41 – 50	9	6.0
Over 50	9	6.0
Occupation		
Professional / Technical	30	20.0
Blue collar	23	15.3
Service worker	36	24.0
Student	55	36.7
Others	6	4.0
Education		
Junior high school or less	12	8.0
High school	36	24.0
College	88	58.7
Post graduate	14	9.3
Monthly income		
Less than NT$20K	65	43.3
NT$20K – 30K	20	13.3
NT$30K – 40K	50	33.3
NT$40K – 50K	12	8.0
More than NT$50K	3	2.0

demographic characteristics. Items relating to behavior characteristics of respondents were also included.

Results and Discussion

As shown in Table 1, 53.3% of the respondents were female while male represented 46.7% of the population. By age, majority of the respondents were in the age group of "under 25" and "26 – 30 years old", represented by 32% in each group. By occupation, majority of the respondents were students (36.7%), followed by service workers (24.0%). By education, a heavy majority of the population had earned a college degree, at 58.7%. By monthly income, majority of respondents were earning less than NT$20,000 (48.3%), followed by "NT$30,000–40,000" (33.3%).As shown in Table 2, majority of the respondents were experienced visitors to a homestay in which 62.0% had more than three times of stay. Also in the majority was how respondents

Table 2. Behavior characteristics of the respondents

Behavior Characteristic	Number of Respondents	Percentage of Respondents
How many times have you stayed in a homestay?		
Once	8	5.3
Twice	17	11.3
3 times	32	21.3
More than 3 times	93	62.0
How did you receive information about the homestay?		
Large events	7	4.7
Travel agency	17	11.3
Travel handbook	9	6.0
Newspaper / magazines	1	0.7
Pass by	1	0.7
TV commercials	2	1.3
Internet	21	14.0
Friends / relatives	92	61.3
What is the number of party in your travel group?		
2 or less	4	2.7
3 – 5	105	70.0
5 – 10	30	20.0
More than 10	11	7.3
What type of leisure activities do you participate in a homestay?		
Hiking	87	58.0
Cycling	34	22.7
Fishing	7	4.7
Bird watch	1	0.7
Photographing	4	2.7
Others	17	11.3
Will you pay a repeat visit to the homestay?		
Yes	89	59.3
Maybe	55	36.7
No	6	4.0
The reason you refuse revisiting a homestay is:		
Traffic	4	2.7
Too crowded	3	2.0
Bad service	8	5.3
Lack of attractiveness	26	17.3
Old facility	17	11.3
Lack of views and uniqueness	92	61.3

received information about the homestay where 61.3% received from friends and/or relatives. Most traveling parties to a homestay had three to five people (70.0% of respondents). Hiking was found to be the most frequent leisure activity while staying at a homestay, by 58.0% of the respondents. Majority of respondents indicated that they were willing to revisit the homestay they had stayed (59.3% of respondents). The top reason that respondents refuse to revisit a particular homestay is the lack of views and uniqueness

offered by the homestay (61.3% of respondents). As shown in Table 3, results of the satisfaction analysis were proven reliable by the Cronbach's alpha (> .70). In the six measures of "System Quality", highest mean was found in "personal security" (4.44), followed by "capability to handle multiple tasks" (4.42) and "easy to use" (4.39). There were also six items in "Information Quality" in which the highest mean was found in "fits my personal needs" (4.46), followed by "easy to understand" (4.45), "accurate" (4.39), and "up-to-date" (4.39). There were five items in "Intention to Use" in which the highest mean was found in "increases my trust on the website" (4.22), followed by "intend to purchase more" (4.20)" and "intend to use repeatedly" (4.19). Of the four items under "User Satisfaction", both "satisfied with the menu truthfulness" and "satisfied with the overall function" were the highest mean at 3.75. Finally, there were five items in "Net Benefits" in which the highest mean was found in "saves communicating time" (4.29), followed by "saves planning time' (4.24) and "knowledge of actual amount exchanged" (4.20).

Regression analysis was performed on each of the seven established hypotheses. The results of regression analysis for "System Quality" and "Information Quality" as independent variables with "Intention to Use" as the dependent variable are shown in Table 4. The positive regression coefficient (Beta = .459) in "Information Quality" indicated that the regression model was statistically significant and that "Information Quality" positively affects respondents' "Intention to Use". However, the negative regression coefficient (Beta = -.021) in "System Quality" indicated statistical insignificance, meaning invalid hypothesis that "system quality affects intention to use".

The results of regression analysis for "System Quality" and "Information Quality" as independent variables with "User Satisfaction" as the dependent variable are shown in Table 5. The positive regression coefficient (Beta = .273) in "System Quality" indicated that the regression model was statistically significant and that "System Quality" positively affects "User Satisfaction". Similarly, the positive regression coefficient (Beta = .771) in "Information Quality" also indicated statistical significance in that "Information Quality" positively affects "User Satisfaction". Specifically, significance was shown highly of the validated hypothesis from $p = .001$.

The result of regression analysis of "User Satisfaction" as the independent variable with "Intention to Use" as the dependent variable is shown in Table 6. The negative regression coefficient (Beta = -.035) indicated that the regression model was statistically insignificant, meaning the invalid hypothesis that "user satisfaction positively affects intention to use".

The results of regression analysis for "Intention to Use" and "User Satisfaction" as independent variables with "Net Benefits" as the dependent variable are shown in Table 7. The negative regression coefficient (Beta = -.054) in "Intention to Use" indicated that the regression model was statistically insignificant that the hypothesis of "intention to use positively affects net benefits' was proven invalid. Similarly, the negative regression coefficient (Beta = -.049) in "User Satisfaction" also indicated statistical insignificance, meaning invalid hypothesis that "user satisfaction affects net benefits".

Table 3. Satisfaction analysis

Attributes	Mean	S.D.
System Quality (α = .705)		
1. Fast response	4.13	0.559
2. Reliable operating system	4.21	0.457
3. Easy to operate	4.39	0.528
4. Capability to handle multiple tasks	4.42	0.522
5. Operation stability	4.35	0.478
6. Personal security	4.44	0.549
Information Quality (α = .725)		
7. Completeness	4.22	0.447
8. Fits my personal needs	4.46	0.500
9. Accurate	4.39	0.490
10. Up-to-date	4.39	0.517
11. Easy to understand	4.45	0.538
12. Provides good layout	4.17	0.540
Intention to Use (α = .801)		
13. Intend to spend more time	4.14	0.645
14. Intend to use repeatedly	4.19	0.711
15. Intend to purchase more	4.20	0.760
16. Intend to recommend to others	4.17	0.632
17. Increases my trust on the website	4.22	0.767
User Satisfaction (α = .802)		
18. Satisfied with the web interface	3.70	0.825
19. Satisfied with the information content	3.73	0.776
20. Satisfied with the menu truthfulness	3.75	0.810
21. Satisfied with the overall function	3.75	0.957
Net Benefits (α = .749)		
22. Saves planning time	4.24	0.539
23. Saves communicating time	4.29	0.638
24. More understanding of what is provided	4.13	0.598
25. Increased affection	4.09	0.665
26. Knowledge of actual amount exchanged	4.20	0.666

Table 4. Results of regression analysis on H1 and H2

Variables	Beta	S.D.	*t*-value	Significance
Constant	.191	0.041	4.645	.000***
System Quality	-.021	0.115	-0.182	.856
Information Quality	.459	0.169	2.708	.008**

$F = 3.681$; $R^2 = .048$; Adjusted $R^2 = .035$; $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 5. Results of regression analysis on H3 and H4

Variables	Beta	S.D.	*t*-value	Significance
Constant	.445	0.058	7.700	.000***
System Quality	.273	0.162	1.637	.094
Information Quality	.772	0.238	3.240	.001**

$F = 6.067$; $R^2 = .076$; Adjusted $R^2 = .064$; $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 6. Results of regression analysis on H5

Variables	Beta	S.D.	*t*-value	Significance
Constant	.287	0.026	10.885	.000***
User Satisfaction	-.035	0.058	-0.602	.548

$F = 0.362$; $R^2 = .002$; Adjusted $R^2 = .004$; $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 7. Results of regression analysis on H6 and H7

Variables	Beta	S.D.	*t*-value	Significance
Constant	.280	0.026	10.669	.000***
Intention Use	-.054	0.061	-0.885	.378
User Satisfaction	-.049	0.043	-1.138	.257

$F = 7.792$; $R^2 = .096$; Adjusted $R^2 = .084$; $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Conclusion

In general, respondents were very satisfied with "System Quality ($M = 4.32$)" and "Information Quality ($M = 4.35$)" of the developed cloud computing APP system. The also indicated highly of "Intention to Use ($M = 4.18$)" and "Net Benefits ($M = 4.19$)". Interestingly, "User Satisfaction" received the lowest mean score, at 3.73. Four items relating to "User Satisfaction" were web interface, information content, menu truthfulness, and overall function. It may be interpreted that respondents were not as satisfied with the design APP as they were satisfied with the cloud computing information system (IS). This particular finding is understandable that the developed web page interface, information, menu, and functions are in the early phase which requires constant modification according to user feedback. Nevertheless, the overall cloud computing APP system for homestay has proven to be successful.

The regression analysis validated three of the seven proposed hypotheses; H2: Information quality positively affects intention to use; H3: System quality positively affects user satisfaction; H4: Information quality positively affects user satisfaction. Statistical significance was not found in H1 (System quality positively affects intention to use), H5 (User satisfaction positively affects intention to use), H6 (Intention to use positively affects net benefits), and H7 (User satisfaction positively affects net benefits). It must be noted that statistical insignificance doesn't necessary mean that these four hypotheses are invalid. Under different circumstances (e.g. larger sample, different sample population, etc.), these four hypotheses may yet be proven valid. The authors take note that the imbalance of

the sample population (e.g. most respondents were young, students, and low income) may have limited representation of the sample population. A caveat to be made here is that respondents who made the time to participate in the on-line survey tend to be young and students. Middle aged professional adults with mid to high incomes may not find the time for participation of the survey, or maybe simply unwilling to participate. It is a phenomenon that studies of internet survey must overcome.

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QUALITY CULTURE AND CAPABILITIES PROCESS SUPPLY CHAIN OF SMEs

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Abstract

The research aims to analyze the process capability, quality culture and the relationship between process capability and quality culture. The research method using descriptive analysis with a sample of each 30 each supply chain level, bringing the total amount to 90. The study was conducted in SMEs with culinary business sector that is processing cassava chips, soy chips, meatballs and chips in the city of Sumedang, Cimahi and Sukabumi. From the results of the analysis showed the low capability of the processes occurring in the downstream, upstream and internal supply with a value of CP : ranges from 12:38 - 12:42, CPU 0.75 - 0.85 , CPL 0:00 and Cpk 0:00 which shows that the process in the upstream, downstream and internal supply does not meet the restrictions specification. Cultural influences on the quality of process capability is the significance of the coefficient determinant in upstream 88.3% downstream 84% and in internal supply 61%.

Key Words : Quality Culture, Process Capability, SMEs, Supply Chain

Introduction

Process capability associated with the fulfillment of material specifications that go into a process to ensure products meet the requirements set. Specifications are measured with a minimum and maximum limits or subject to the constraints that are allowed in a process. With the analysis of the capability of the process is expected to produce a product with a consistent level of high quality dimensions. Product uniformity significantly associated with the level of customer loyalty, which in turn will impact on the value of the company's financial value (Tejaningrum: 2014). Based on previous studies showing that the products Small and Medium Enterprises (SMEs) in Indonesia has inconsistency in the quality dimension of the aspects of reliability, performance, features, durability, serviceability, esthetic, perceived quality, conformance to specification. It seems simple at all when we are going to consume products of small and medium enterprises for example in the culinary field, often we will get a taste of the food

was inconsistent suppose good taste, but sometimes the most salt, may also be too spicy, and others. In the fashion industry, suppose we buy the shoes of the same size in the same factory but different when we use it. This condition also occurs in culinary cassava chips, soy chips and chips, fish balls in Cimahi, Sukabumi and Sumedang generally consumers assess a variety of flavors that is different. Consistency is determined by the dimensions of quality management compliance in meeting the specifications of materials in the process (Tejaningrum: 2013). Consistency of product quality dimension relates to the process capability, how capable the processes that occur in the internal supply and in the process upstream and downstream.

These issues rarely come across in large industries, we can feel how light a particular brand will be able to survive 5000 hours, and when we bought 3 or 4 lights or even to light production number a million so will have a compliance of 99% that the lamp life is the same i.e. 5000 hours. The condition is the condition, which became one of the reasons the inability of SMEs to compete. On the other hand the existence of SMEs so became the mainstay of the Government of Indonesia as one of the business sector that is able to absorb human resources. Based on statistics Ministry of Cooperatives, Small and medium enterprises of the Republic of Indonesia, showing SMEs in Indonesia reached 56.5 million and absorb 99% of the workforce, while the contribution of SMEs to the gross domestic product reached 56% (www.depkop.go.id).

SMEs Creative industries in Indonesia that covers 15 sectors one of which is culinary. Culinary or food industry in Indonesia is growing rapidly as evidenced by the growth of restaurants, cafés, snacks and in line with technological developments in social media, culinary become one of the much talked about in each of the actors of social media. While on the other hand the growth of foreign culinary inevitable. This study focused into the process capability of SME products based creative industries, especially the culinary field by analyzing how far the culture of a quality that SMEs are able to maintain process capability.

Theoretical Review

SMEs Concept

The object of research is the Small and Medium Enterprises by reference to Law No. 20 of 2008. The following are definitions and small, medium and micro enterprises (SMEs)

Small Business: The business is economically productive stand-alone, conducted by an individual or business entity that is not a subsidiary or not a branch of the company owned, controlled, or be a part either directly or indirectly from medium or large businesses that meet the criteria for Small businesses referred to in this Act.

Medium Business: Is a productive economic activities that stand alone, carried out by an individual or business entity that is not subsidiaries or branches of companies owned, controlled, or be a part either directly or indirectly by the

Small Business or large enterprise with total net assets or annual sales revenue as stipulated in this Law.

As for the criteria of Micro, Small and Medium according to this Law are classified by the number of assets and turnover is owned by a business, as shown in the following table 1:

Table 1: Criteria for Micro, Small and Medium According to Law No. 20 of 2008

BUSSINES	**criteria**	
	Asset (Rp)	**Revenue (Rp)**
Micro	Max . 50 million	Max 300 million
small	> 50 million – 500 million	> 300 million – 2,5 billion
medium	> 500 Million– 10 billion	> 2,5 billion – 50 billion

Source: Law No 20 of 2008

Process Capability Concept

Process capability can be interpreted as far as the characteristic dimension of the quality of products to meet the requirements that have been set. The expected requirements should be quantitative or measurable with their specific limitations lower limit and upper limit specifications. To analyze the process capability using three sizes: 1) Process Capability Ratio, 2) Upper and Lower Capability reindexes and 3) a process capability index. Each the size of those three things is as follows:

(1) Process Capability Ratio or Process Capability Index (Cp)
Cp = (USL - LSL) / 6σ

USL = Upper Specification Limit
Lowe Specification Limit LSL =
6σ = six sigma

From these calculations if:
Cp > 1 process is still good
Cp < 1 process is not good
Cp = 1 the same process with the specification

(2) Upper and Lower Capability Indexes

$$\text{CPU} = \frac{USL - \mu}{3\sigma}$$

$$\text{CPL} = \frac{\mu - USL}{3\sigma}$$

CPU : Comparison of the range is above average
CPL : Comparison of Range Below Average

(3) The process capability index (Cap Index)

The above process capability index measures the ability of potential, with no regard to average conditions of the process. On average, the process is assumed to be equal to the midpoint of the boundary limits of the specifications and processes that are in the condition in statistical control. In fact,, the average value is not always in the middle, so it is necessary to know the variety and location average process. Cpk value represents the true power of a process with a specific value parameter (Syukron and Kholil , 2012 p 74). Cpk value is formulated with

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$$\text{Cpk} \quad \min\left(\frac{USL - \mu}{3\sigma}, \frac{\mu - \text{USL}}{3\sigma}\right)$$

Cpk ≥ 1 process is called good (capable)
1 ≤ Cpk process is less well known (non-capable)

Cpk value shows the true power of the process with the values of the parameters. If the average value is verily the same as the middle value, then the actual value of Cpk = Cp value. The higher the index of process capability then the less a product that is beyond the specification limits. There are several things that are used as an illustration in the analysis of process capability and Cpk index values, namely:

- The ratio of process capability cannot change such as changes in the center of the process.
- Value ratio-process capability index Cpk equal to conditions when the process is centralized
- The de facto Cpk index equal to 1, which indicates that the process produces a product that is not in accordance with specifications
- Cpk value less than 1 indicates that the process produces a product that is not in accordance with specifications
- The value of process capability ratio less than 1 indicates the process is not well or not worthy

Table 2: process capability index (Cp) and products outside of specification limits

Process capability index	The number of products that are outside the boundaries both sides of the specification
0.5	13.36 %
0.67	4.45%
1.00	0.3%
1.33	64 ppm
1.63	1 ppm
2.00	0

Source : Syukron and Kholil (2012, p:75)

- Cpk value is equal to zero (0) indicates the average value of Cpk is equal to 1 means the same as specification limits
- Negative Cpk value represents the average being out of

specification

- The ability to process the desired ratio is greater than or equal to 1
- The value of process capability ratio is equal to 1 means the stretch of the same process with the specification.

As for the relationship between the index and process capability index Process performance can be seen in the following table :

Process capability	Process Performance
$\text{Cp} = \frac{USL - \mu}{3\sigma}, \frac{\mu - USL}{3\sigma}$	$= \frac{USL - LSL}{6\sigma}$
$\text{Cpk} = \min(\frac{USL - \mu}{3\sigma}, \frac{\mu - \text{USL}}{3\sigma})$	$\text{Cpk} = \min(\frac{USL - \bar{x}}{3\sigma}, \times -\text{USL}, \frac{}{3\sigma},$

Supply Chain Concept

In the supply chain, there are three parts or components that accompany the activity of the supply chain: 1) Supply Chain Upstream: the parts involved in the process upstream, usually is associated with sources of procurement of raw materials, auxiliary materials, tools or machines used also other sources as a supporter of the main process, the main activity in the supply chain are procurement and purchasing, while the second 2) Management of Internal supply chain: the part that carry out processing of raw materials into a final product that is ready to be distrib-uted to consumers, the main activity of the supply chain in this component is your warehouse of raw materials and the process of transformation of input menjaid output, and to 3) is a supply chain downstream is activities related to the distribution of finished products or semi-finished to the distributor to be delivered to the end consumer, the activities involved usually are associated with transportation, warehousing and distribution and after sales service (Pujawan : 2005)

In analyzing the chain of supply chain, it must be seen as a comprehensive unity, from upstream to downstream until the product to the consumer. Croxton, Garcia-Dastugue, Lambert, and Rogers (2001) emphasized the effectiveness of supply chain to the chain of processes from upstream to downstream. Lambert and Cooper (2000) insisted the importance of the role of marketing in the supply chain. Spillan, McGinnis, Kara, and Yi (2013) emphasized the effectiveness of coord-ination of logistics, customer service effectiveness, and the effectiveness of an impact on the organization. Stefan Seuring and Joseph Sarkis (2008) mentioned that a supply chain must consider the social and environmental aspects. While Stank, Keller, and Daugherty (2001) said that the collaboration among the external supply chain impacts the reliability of internal collaboration processes (Tejaningrum : 2016).

The concept of quality culture, adopting what is delivered Tejaningrum (2015) : trust, action, thought patterns, values, habits, thought, believed and owned by members of the organization. Beliefs and values are reflected in the decision making process, the behavior of Human Resources, Environmental Management, Management of Engineering and artifacts, as well as the obsession with quality.

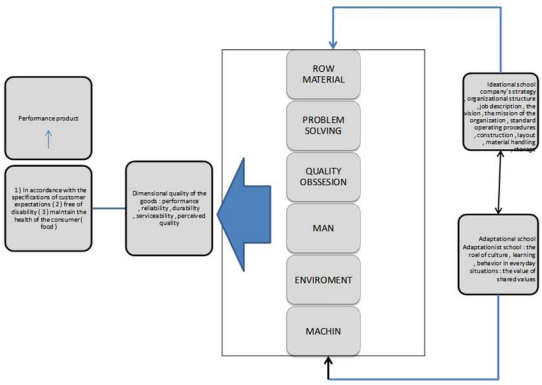

Figure 1: Quality Culture Models (Tejaningrum : 2015)

The Concept of Quality Culture

Six dimensions that can be used as a model for measuring the cultural quality of the company : 1) Treatment of materials, ranging from raw materials to the output 2) Handling machinery and production equipment 3) Artefacts / production environment 4) Human Resources 5) Problem solving 6) obsession with quality, all these dimen-sions associated with trust, action, thought patterns, ,values, habits, thought, believed to be from the leader / employee / member organizations in the process of improving the performance, reliability, durability, serviceability, perceived product continues constantly.

The Research Methodology

Design Research

Research methodology In this study used qualitative research methods, according to Creswell (2009) in Sugiyono (2008) there are five types of qualitative research. Phenomenological Research, Grounded Theory, Ethnography, Case Studies dan Narrative Research. In this study using the approach ethography is a qualitative strategy in which researcher studie an intact culture group in a natural setting over a prolonged period of time by collecting primarily observational and intervied data. Bogdan and Taylor (1975:5) in Lexy J. Moleong (2007) states that qualitative research as a research procedure that produces descriptive data in the form of words written or spoken of the people and behaviors that can be observed. Erickson (Sugiyono:2008) mentions that the characteristic feature of qualitative research are :

- Intensive, long term participation in field setting
- Careful recording pf what happens in the setting by writing field notes and interview notes by collecting other kinds of documentary evidence.

- Analytic reflection on the documentary records obtained in the field
- Reporting the result by means of detailed descriptions, direct quotes from interview, and interpretative commentary.

Design research in qualitative research methods are common, flexible, evolving and emerging in the research process. While data collection techniques are participant observation, In - depth interviews, documentation and triangulation (Tejaningrum :2015)

Results and Discussion

1. Process Capability in the Downstream

SMEs in their business process to distributor to distribute the product to be delivered to the end consumer. In the process of this research activity packaging distributor (product cassava chips and fish chips) and frying (distributor soy chips). Based on an analysis of 30 samples obtained values of process capability : Cp : 0:38 , 0:00 CPL , CPU : 0.75 and Cpk : 0.00

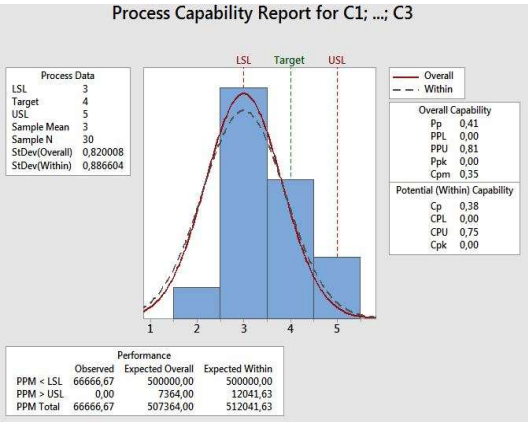

Figure 2 : Capability Process Downstream

Based on these data , the conclusions are as follows :

- Cpk value less than 1 (0.00) shows that the process produces a product that is not in accordance with specifications
- Cp < 1 (0.38) indicates that the process is not good
- CPL = 0.00 The above shows that the data is lower control limits and
- CPU = 0.75 only a small portion of data that meets the upper control limit

Thus the process capability in the upstream demonstrate a process that does not pick accordance with specifications .

2. Process Capability in The Upstream

SMEs in the business process requires raw materials and auxiliary materials obtained from suppliers. Raw materials such as soy, fish balls, cassava and oil for frying. Based on the data analysis process capability in the upstream chain obtained value as follows : CP : 042 , CPL : 0.00 , CPU : 0.75 and Cpk : 0.00

Based on these data , the conclusions are as follows :

- Cpk value less than 1 (0.00) shows that the process produces a product that is not in accordance with specification
- Cp < 1 (0.42) indicates

that the process is not good

- CPL = 0.00 The above shows that the data is lower control limits and

- CPU = 0.85 only a small portion of data that meets the upper control limit

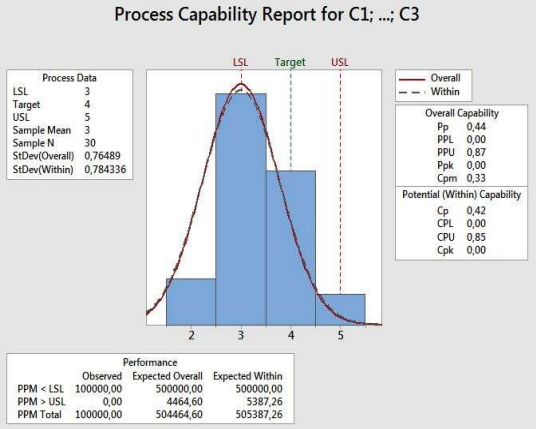

Figure 3 : Capability Process Upstream

Thus the process capability in the upstream demonstrate a process that does not pick accordance with specifications .

3. *Process Capability in The Internal Supply*

Process capability in SMEs or SME factory obtained values are not much different from the upstream and downstream. Here are the values of process capability : CP : 0.38 , CPL : 0.00 , CPU : 0.77 and Cpk : 0.00.

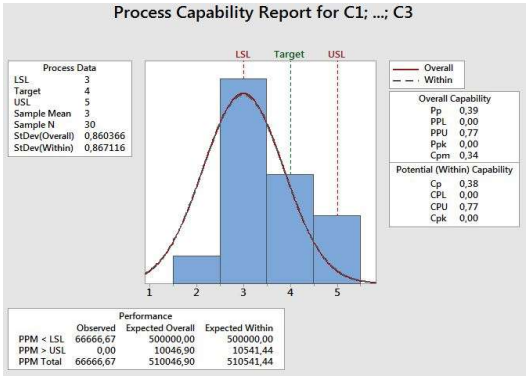

Figure 4 : Capability Process Internal Supply

Based on these data , the conclusions are as follows :

- Cpk value less than 1 (0.00) shows that the process produces a product that is not in accordance with specifications

- Cp < 1 (0.38) indicates that the process is not good

- CPL = 0.00 The above shows that the data is lower control limits and

- CPU = 0.77 only a small portion of data that meets the upper control limit

Thus the process capability in the upstream demonstrate a process that does not pick accordance with specifications.

2. Cultural quality of SMEs

Based on the analysis of the following field is a culture of quality SMEs in both the upstream, downstream and in the internal supply (Tejaningrum : 2016)

Table 2 : Quality Culture in Internal Supply Chain

	Raw materials	Process	End process	Labour	Environment	Average
Soy chips	3.47125	3.735	3.72375	3.52875	3.8588	3.6635
Chips fish balls	3.18375	2.95875	2.81125	2.96	2.2325	2.82925
Cassava chips	3.64	3.7	3.43333	3.4	2.715	3.64
Average	3.6453	3.73715	3.67566	3.46265	3.35	3.62661

Source: Tejaningrum (2016)

Table 3 : Quality Culture Upstream and Downstream

Industrial cluster	Material	Labour	Environment	Average	Material	Labour	Environment	Average
Soy chips industry	3.675	3.45	3.715	3.613	3.135	3.366	3.951667	3.48
Industrial chips fish balls	2.938	2.92	2.486	2.781	2.9975	3.10	2.965	3.0208
Industrial cassava chips	3.126	3.1230	2.503	2.917	3.699	#DIV/0!	4.074	3.840
Average	3.503	3.07	3.308	3.360	3.4486	3.499	3.751	3.5662

Source: Tejaningrum (2016)

3. Culture of Quality and Process Capability

The next analysis is the relationship between cultural quality of the process capability, based on the results of the analysis in downstream seen that there is a close connection between the culture of quality and capability in the downstream, the correlation coefficient of 73.7 % with determinant coefficient of 84%. Thus concluded that the culture associated with the quality of the process capability in the category closely (0.73) and quality of the company culture influence the process capability by 84 %.

Regression Analysis: QUALITY CULTURE versus CAPABILITY DOWNSTREAM

```
The regression equation is
QUALITY CULTURE = 1,033 + 0,7182 CAPABILITY DOWNSTREAM


S = 0,358195   R-Sq = 73,7%   R-Sq(adj) = 72,7%


Analysis of Variance

Source      DF       SS       MS      F      P
Regression   1  10,0577  10,0577  78,39  0,000
Error       28   3,5925   0,1283
Total       29  13,6502
```

Fitted Line: QUALITY CULTURE versus CAPABILITY DOWNSTREAM

How the relationship between process capability and quality culture in the upstream. The results of the analysis are not much different from what happened in the downstream. The data shows a correlation coefficient of a culture of

quality and process capability in upstream amounted to 78.1 % with determinant coefficient of 88.3 %.

Regression Analysis: QUALITY CULTURE versus CAPABILITY UPSTREAMS

The regression equation is
QUALITY CULTURE = 1,454 + 0,6221 CAPABILITY UPSTREAMS

S = 0,311447 R-Sq = 78,1% R-Sq(adj) = 77,3%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	9,6618	9,66177	99,61	0,000
Error	28	2,7160	0,09700		
Total	29	12,3777			

Fitted Line: QUALITY CULTURE versus CAPABILITY UPSTREAMS

How the quality and capability of cultural relations in the process of internal supply, from the analysis results obtained regression coefficient of 38.4 % with determinant coefficient of 61.6 %. It can thus be concluded that there is a weak relationship between the culture of quality and process capability in the internal supply with a value of 0: 38 while the influence of 61.5 %

Regression Analysis: QUALITY CULTURE versus CAPIBALITY INTERNAL SUPPLY

The regression equation is
QUALITY CULTURE = 1,628 + 0,5302 CAPIBALITY INTERNAL SUPPLY

S = 0,523173 R-Sq = 38,4% R-Sq(adj) = 36,2%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	4,7693	4,76933	17,42	0,000
Error	28	7,6639	0,27371		
Total	29	12,4332			

Fitted Line: QUALITY CULTURE versus CAPIBALITY INTERNAL SUPPLY

Conclusion and Recommendations

SMEs have a culture of quality is still low and also capability process outside the specification limits to the value of CP, .CPU, CPL and Cpk is not as it should be . This condition is one of the low competitiveness of SMEs . The data showed that the cultural values of good quality in internal supply, down-stream and upstream in the category enough, this condition adversely affects the process capability. Some conclusions can be submitted are : 1) Capability in downstream processes is still low with a value of CP : 00:38 , CPL : 0.00 , CPU : 0.75 and Cpk : 0.00 with an average value of a quality culture for 3.5662. 2) In the upstream process capability is still low with a value of CP : 0:42 CPL : 0.00, CPU : 0.85 and Cpk : 0.00 with an average value of a quality culture 3.360. 3) Capability Internal processes in supply is still low, or they do not conform to the specification limit values CP : 00:38 , CPL : 0.00 , CPU : 0.77 and Cpk : 0.00 with an average value of a quality culture by 3.626.

The magnitude of the relationship and the influence of culture on the quality of the process capability is very large with determinant coefficient value of upstream 88.3% and downstream 84% and of internal supply 61.5%. Thus the SME business people should be able to foster a culture of quality in order that our process capability can be increased .

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HOW INERTIA INFLUENCE IMAGE-QUALITY RELATIONSHIPS IN LEISURE FARMING

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Abstract

The tourism marketplace is becoming more highly competitive. Developing the competitive strategy, however, is a challenging task for many farm managers because the industry is changing dramatically in the face of intense competition, increasing tourist sophistication, and rapid technological advances. How to enhance tourists' revisit intention for farm managers have become more and more important. This study was aimed at investigating the potential role of tourists' inertia in influencing their revisit intentions. Questionnaire survey was employed to collect the data. The findings show that inertia is an important moderator when predicting tourists' relationship quality in leisure farming context. When tourists have a high level of inertia, they tend to buy a certain product repeatedly because switching is too bothersome in that it necessitates various investments of effort and time. Some more implications are suggested herewith.

Keywords: Leisure farming, destination image, relationship quality, inertia

Introduction

Within the agritourism industry in Taiwan, three types of experience service are offered by leisure farms i.e. agricultural experience activities, food and beverage service, and accommodation service (Yen, Liu, and Chen, 2012).However, with the active growth of agritourism, the total amount of leisure farms has exceeded 1,272 in 2014.The amount of visitors to leisure farms was 9.59 million in 2008, 24.5 million in 2015 and recording a total revenue of 10.5 billion NT dollars in 2015 (Executive Yuan, 2016).

Taiwanese agritourism is now facing some marketing difficulties. For instance, the higher churn rate of the tourists or low revisiting rate despite of high revisit intention (Yen et al., 2012). How to attract visitors has become an emerging issue for the government and the practitioners.

Reflecting upon these problems identified above, it has been acknowledged that the image perceived by tourists of a destination plays an important role in their decision-making, destination choice, post-trip evaluation, and future behaviors (e.g. Baloglu and McCleary, 1999; Echtner and Ritchie, 1991; Gallarza, Saura, and García, 2002; Yen and Chung, 2014). Consequently, they have been examined extensively in the tourism literature (Pike, 2002). Past studies have evidenced its determinants and consequents. Many studies have found perceived risk (Chew and Jahari, 2014; Fuchs and Reichel, 2006, 2011; Lehto et al., 2008), attractions (Qiu et al., 2012; Shen, 2012; Zhang, 2012), infrastructure (Qiu et al., 2012; Shen, 2012; Zhang, 2012), environment (Qiu et al., 2012; Shen, 2012; Zhang, 2012), service quality (Qiu et al., 2012; Shen, 2012; Zhang, 2012), feeling and emotion (Hu, 2010; Qu et al., 2011; Zhu (2011) would be the determinants of destination image. Moreover, revisit intention, intention to recommend, complaints, and switch behaviors were found to be the possible consequents (Chew and Jahari, 2014; Fuchs and Reichel, 2006, 2011; Lehto et al., 2008). Fewer studies, however, explored the moderators when studied destination image. For example, the better image a tourist perceived could enhance her/his revisit intention moderated by relationship quality (Yen and Chung, 2014). This moderated relationship would be very important when measuring the image- intention relationship. Another illustrated that destination relationship could mediate image- intention relationship (Chen and Phou, 2013). The role of image played is confused to researchers in tourism context. To clarify its complex role to researchers would be needed. This study seeks to understand the nature of a relationship between these concepts.

This study argues that inertia of a tourist needs to be regarded as an important moderator to influence the relationship between destination image and relationship quality (RQ). A strong inertia tourists' perceived means their disinterest in actively processing relevant information to make the best possible choice (Yanamandram and White, 2006; Kim, Ok, and Canter, 2010). Thus, tourists' inertia leads them to repeat the same purchase pattern, similar to a habit (Bozzo, 2002; Kim, Kim, and Kim, 2011), concentrating on familiar few destinations. As a result, tourists' perceived higher destination image might have lower probabilities impact RQ. Consequently, this study proposes that destination marketers should address the inertia issue, which ultimately exercises a power to differentiate it from competitors. The current study proposes that inertia should be regarded as a moderator.

Therefore, the current study develops and tests a model of tourists' inertia that incorporates such contingencies between destination image and. RQ. A contingency approach has been called for by a number of researchers (e.g., Yanamandram and White, 2006; Bozzo, 2002; Kim, Kim, and

Kim, 2011), but has generally not been adopted in studies of RQ for leisure farming. A core proposition is that the effects of destination image on RQ depend on the magnitude of inertia in the leisure farming context. Some components of destination image should play a greater role when inertia is high and a lesser role when inertia is low. This proposition, if supported would (1) augment existing RQ models which focus mostly on destination image, (2) help to explain variability in the destination image - RQ relationship evidenced in prior research, and (3) provide guidance to leisure farming in developing destination image - RQ programs.

Methodology

Having considered the data collection requirements of this study such as a need of large sample of customers and quantities of Taiwanese agritourism, it would be appropriate to employ the field survey with a self- administered questionnaire as the primary data collection technique. The field study method was chosen in order to gain information directly from individuals at the leisure farm settings. As such, their feelings and perceptions about the setting with respect to destination image (DI), relationship quality (RQ) and inertia are likely to be clearly in mind (Danaher and Mattsson, 1994). Furthermore, in order to clarify the relationship between variables, two hypotheses were listed based on previous studies.

H1: Destination image positively impacts relationship quality.

H2: As perceived inertia increase, the relationship between destination image and relationship quality will diminish (i.e., destination image ×relationship quality)

After the hypotheses were drawn, variables could be defined. DI was defined as a tourist's perception about the image of relax atmosphere, destination brand, cultural environment, and entertainment at a destination. RQ was defined as a tourist's perception about the whole evaluation incorporating satisfaction, trust, and commitment to a destination. Inertia was the perceptions of a tourist about the level of habits or troubles within his/her decision-making to tourism.

To ensure validity, this study is constructed on the basis of scales adopted, in large part, from previous studies, using existing scales for measuring destination image, relationship quality and tourist inertia. Fifteen items for destination image are distinguished, based on the studies of Chen and Phou (2013), Yen, and Chung (2014). Ten items for relationship quality are distinguished, based on the studies of Yen and Chung (2014), Chen, and Phou (2013). Inertia comes from Kim, Kim, and Kim (2011), and Yen, Liu, and Chen (2012).Likert scales (1-5) with anchors ranging from "strongly disagree" to "strongly agree" are used for all questions. All of these scales have been shown to be reliable and valid, based upon prior research.

It was decided that the model would be tested by collecting data from leisure farms in Taiwan. The criteria for farms' selection were based on their service quality of experience, food and beverages, and accommodation certified by Taiwan Leisure Farms Development Association (TLFDA).

Finally, 23 farms were drawn and could be categorized into full-service farms and limited-service farms. They were selected expecting adequate diversity of quality and loyalty to allow a model to be estimated. A questionnaire was prepared for collecting rating and other information. Items measuring the various constructs were distributed about in the questionnaire to reduce halo effects.

Because the goal was to develop a model, random sampling was not seen as necessary. Surveyors were collecting data from visitors they did not know. Quota sampling was adapted to ensure that respondents were distributed across age and sex groups. A personal interview method was employed for the survey. Before collecting data, six surveyors were trained for three hours by researchers in order to familiarize them with the aims and methods of this survey. Items measuring the various constructs were incorporated into the questionnaire in order to reduce halo effects. To ensure that respondents were distributed across ages and genders, surveyors were assigned particular combinations of quota criteria and were allowed to select respondents who matched these criteria (e.g., friends, family and neighbors). Respondents were asked to complete the questionnaire and then to describe the meaning of each question, to explain their answers, and to state any problems they encountered while answering questions. Some questionnaires were also offered at the counter for visitors to fill in, thus allowing the researcher to collect different kinds of sample.

Furthermore, collecting data on both weekends and weekdays during June-July of 2014 helped the researchers to collect both peak and off-peak time samples. Finally, 315 valid questionnaires were received from lodging place in Kenting area in Taiwan. With regard to demographic characteristics (Table 1), approximately 50.8% of respondents were female. As regards age, 25.1% respondents were less than 33 years old, 39.4% respondents ranged from 33-43 years old, 30.5% respondents ranged from 43-53 years old, and 4.8% respondents exceed 54 years old or above. Approximately 47% respondents were university graduates or above, and approximately 66.3% of respondents were first-time visitors.

Result

Normality was tested by means of SPSS 17.0 based on the skewness and kurtosis of the observed variables (Bollen, 1989). Both samples revealed acceptable kurtosis (0.071 ~0.966) and skewness (-0.33~ 0.047) for most observed variables (see Table 2). Table 2 reports the descriptive statistics and reliability for measure items. Principal component analysis (PCA) using VARIMAX rotation was conducted for the total sample to test the dimensionality of the destination image, relationship quality and inertia constructs. The number of factors extracted was determined by the number of items with eigenvalue greater than 1.0. Factor loadings below 0.5 were suppressed to emphasize the simple structure and aid interpretation of the factor. The various indicators of factorability were good, including communality exceeds 0.5, KMO was higher than 0.7and Bartlett's Test was significant for all constructs. As indicated in Table 2, five components with an eigenvalue of greater than 1.0 were found in each of

Table 1. Demographic characteristics (n=315)

Item	n	%	Item	n	%
Gender			Month Average Income(thousand)		
Male	141	44.8	<30	9	2.9
Female	160	50.8	30-60	231	73.3
NA	14	4.4	60-80	56	17.8
Age(years)			>80	10	3.2
<33	79	25.1	NA	9	2.8
34-43	124	39.4	Resident Area		
44-53	96	30.5	North	80	25.4
＞54	15	4.8	Center	86	27.3
NA	1	.3	South	103	32.7
Education			East	41	13.0
Primary	40	12.7	other	5	1.6
High school	124	39.4			
Undergraduate	114	36.2	Experience(time)		
Graduate	34	10.8	First here	209	66.3
NA	3	1	2-4	85	27.0
			NA	19	6.7

destination image named relax atmosphere, natural environment, destination brand, cultural environment and entertainment, explaining 90.9%, 75.73%. 91.07%, 81.59%, and 84.6% of the total variance in each constructs. Three components with an eigenvalue of greater than 1.0 were found in each of relationship quality named satisfaction, trust, and commitment explaining 90.68%, 78.13%, and 90.45%of the total variance in each constructs.

The results shown in Table 2 illustrate that Cronbach's alpha for the measure of relax atmosphere was 0.95, natural environment was 0.938, destination brand was 0.951, cultural environment was 0.887, entertainment was 0.909, satisfaction was 0.948, trust was 0.903, commitment was 0.947 and inertia was 0.907. Overall, the reliability alpha values for all constructs were acceptable with all above the accepted threshold point of 0.7.

A confirmatory factor analysis using AMOS 17.0 is conducted to test the measurement model. Table 3 reports the results. The chi-squares (324) are significant ($p < 0.05$; Bollen, 1989), a finding is not unusual with large sample sizes (Doney and Cannon, 1997). The ratios of chi-square to degrees of freedom (df= 73) are 4.44 for measurement model within the acceptable range of 2 to 5 (Marsh and Hovecar, 1985). The values for GFI (0.904), AGFI (0.842), CFI (0.961), and RMSEA (0.093) are acceptably close to the standards suggested by Hu and Bentler (1999) greater than 0.9 for GFI and AGFI, greater than 0.95 for CFI and less than 0.08 for RMSEA. Given that these batteries of overall

Table 2. Descriptive Statistics (Reliability and validity)

Item	M	SD	SI	KI	L
Relax Atmosphere (VE %=90.90; Alpha=0.950)					
RA1 Place to rest	3.73	.681	-.224	.578	.950
RA 2 Relaxing place	3.77	.689	-.220	.541	.955
RA 3 Peaceful place	3.74	.685	-.179	.496	.956
Natural Environment (VE %=75.73; Alpha=0..938)					
NE1magnificent mountains	3.64	.716	-.250	.834	.860
NE2 impressive beach	3.66	.704	-.067	.274	.918
NE3 favorable park	3.81	.734	-.117	.055	.831
Destination Brand (VE %=91.07; Alpha=0. 951)					
DB1 People are willing to help tourists	3.71	.659	-.186	.639	.959
DB2 Honest and trustworthy people	3.72	.648	-.261	.806	.962
DB3 Offer personal safety	3.71	.634	-.330	.966	.942
Cultural Environment (VE %=81.59; Alpha=0. 887)					
CE1 Cultural attractions	3.65	.699	.015	.229	.873
CE2 Cultural activities	3.64	.695	-.055	.314	.934
CE3 Unusual way of life and customs	3.66	.678	-.004	.336	.901
Entertainment (VE %=84.60; Alpha=0.909)					
E1 Good night life	3.74	.710	-.091	.234	.926
E2 Varied gastronomy	3.76	.706	-.143	.317	.932
E3 Good shopping	3.72	.716	-.069	.184	.901
Satisfaction (VE %=90.68; Alpha=0. 948)					
SA1 I have a high-quality relationship	3.69	.651	-.200	.685	.954
SA2 I am happy with the efforts this farm is making towards visitors like me	3.67	.668	-.123	.503	.953
SA3 I am satisfied with the relationship	3.70	.694	-.106	.353	.949
Trust (VE %=78.13; Alpha=0 .903)					
TR1a feeling of trust	3.67	.651	-.197	.654	.910
TR2 a trustworthy impression	3.65	.651	-.164	.608	.918
TR3 catch my confidence.	3.64	.716	.047	.134	.798
TR products is honest	3.67	.641	-.213	.723	.904
Commitment (VE %=90.45; Alpha=0. 947)					
CO1 to go the extra mile	3.64	.634	-.247	.740	.958
CO2 feel loyal	3.68	.648	-.243	.734	.940
CO3 keep traveling there	3.65	.656	-.232	.644	.955
Inertia (VE %=84.32; Alpha=0.907)					
IN1 habitual to travel	3.74	.698	-.094	-.215	.898
IN2 It is too much trouble to find an acceptable farm.	3.71	.723	-.266	.165	.949
IN3 Searching for an acceptable farm is too much trouble in terms of my time and effort.	3.67	.734	-.235	.071	.907

Note: M: mean; SD: standard deviation; SI: skewness; KI: kurtosis; L: factor loading

goodness-of-fit (GFI) indices were accurate and that the model was developed on theoretical bases, and given the high level of consistency samples, no respecifications of the model were made. This enables authors to proceed in evaluating the reliability and validity.

This study assesses the quality of measurement efforts by investigating uni-dimensionality, convergent validity, reliability, and discriminate validity. Evidence for the uni-dimensionality of each construct included appropriate items that loaded at least 0.634 on their respective hypothesized component and loaded no larger than 0.30 on other components in a factor analysis (see Table 3 and Table 4). In addition, the overall goodness of fit supports uni-dimensionality (Steenkamp and van Trijp, 1991). Convergent validity was supported by all loadings being significant ($p < 0.01$) and nearly all SMC (square of multiple correlation) exceeding 0.30 (Hildebrandt, 1987). This study assesses reliability jointly for all items of a construct by computing the composite reliability (C.R.) and average variance extracted (AVE) (Baumgartner and Homburg, 1996; Steenkamp and van Trijp, 1991). For a construct to assess good reliability; composite reliability should be higher than 0.70, and the average variance extracted should at least be 0.60 (Bagozzi and Yi, 1988). All scales demonstrate good reliabilities.

Table 3. Measurement model of Destination image

Conpt	Item	L	t-values	S.E.	CR	AVE
Relax	RA1	.922			90.90	.950
	RA2	.927	32.760	.031		
	RA3	.937	33.820	.030		
Landscape	NE1	.634			75.73	.938
	NE2	.749	17.377	.066		
	NE3	.867	14.550	.096		
Destination Brand	DB1	.938			91.07	.951
	DB2	.948	37.865	.026		
	DB3	.900	31.783	.029		
Culture	CE1	.831			81.59	.887
	CE2	.868	20.407	.051		
	CE3	.915	18.788	.058		
Entertainment	E1	.892			84.60	.909
	E2	.915	27.478	.037		
	E3	.823	22.165	.042		

χ^2= 324.43; DF=73 (p=.000); χ^2/DF=4.44; GFI= .904; AGFI= .842; CFI= .961; RMSEA= .093

Indicates significance at a level of 0.05.

To examine discriminant validity, current study first checks the coefficients of correlations between factors whether they are significantly lower than 1 and then compared the correlations between factors with their AVE (Gaski and Nevin, 1985). The results show that all of coefficients of co-

rrelations between factors are significantly lower than 1 and the correlations between factors are lower than their AVE, thus confirming discriminant validity. In summary, the measurement model demonstrates adequate uni- dimensionality, convergent validity, reliability, and discriminant validity. This enables authors to proceed in evaluating hypotheses testing.

A maximum likelihood estimation method was used to test the predicted relationships among the constructs in the proposed conceptual model. The overall model fit indices wereχ^2 (13) = 25.49 (p = 0.02), χ^2/d.f. = 1.96, less than the criteria value of 3 suggested by Hair et al. (2010). Furthermore, the indicators of goodness-of-fit supported the very good fit of the model (such as GFI =0.985, AGFI = 0.958, RMSEA = 0.049, and CFI =0.997). This suggests that the hypothesized model fits the empirical data well. Table 4 shows the estimated model with the standardized path coefficients. DI can directly and significantly impact RQ (t=22.27, β=0.913). Thus H1 was supported. Regarding to the components of DI, nice man (t=22.27, λ=0.886) and landscape (t=22.27, λ=0.885) were found to be the key images while establish the relationship within the service providers-tourists. Trust (t=22.27, λ=0.99) was found to be the key item of RQ. The main effects of DI on RQ were contributed by nice man and landscape images tourists' perceived.

Table 4. Results of hypotheses testing (effects of DI on RQ)

Dependent	Independent	t	S.E.	β/λ	SMC
RQ	DI	22.728	.044	.913	.834
Relax	DI	-	-	.857	.734
Landscape	DI	23.630	.042	.885	.783
Destination brand	DI	24.282	.041	.886	.785
Culture	DI	20.747	.044	.815	.664
Entertainment	DI	20.895	.046	.818	.670
SAT	RQ	-	-	.939	.881
TRU	RQ	46.448	.021	.990	.981
COM	RQ	29.129	.031	.867	.751

χ^2= 25.49; DF=13 (p=.02); χ^2/DF=1.96; GFI= .985; AGFI= .958; CFI= .997; RMSEA= .049

Indicates significance at a level of 0.05.

Regarding to the moderated effects of tourists' inertia on DI-RQ relationship, Table 5 reports the results. DI can positively impact RQ across low and high groups in tourists' inertia. As tourists' inertia was high, the effects of DI on RQ would be higher. It can enhance DI-RQ relationship. Thus H2 was supported. The significant role was found that tourists' inertia could moderate DI-RQ relationship. Furthermore, relax image is the key factor of the whole image when tourists' inertia

was low. However, nice man image is found to be a key factor of the whole image when tourists' inertia was high. Moreover, the better image tourists'

Table 5. Results of hypotheses testing (moderated effects of tourists' inertia)

Paths		G1(L)				G2(H)			
		t	S.E.	λ	SMC	t	S.E.	λ	SMC
DI	Relax	-	-	.894	.799	-	-	.876	.767
	Landscape	15.562	.057	.870	.756	18.340	.052	.861	.741
	Destination brand	12.768	.062	.775	.600	21.340	.047	.925	.855
	Culture	12.523	.058	.774	.599	16.958	.056	.828	.685
	Entertainment	12.391	.070	.769	.592	17.896	.053	.851	.724
RQ	SAT	-	-	.860	.740	-	-	.928	.861
	TRU	19.193	.070	.990	.981	30.369	.043	.966	.933
	COM	14.600	.066	.834	.696	27.077	.036	.936	.877
DI-RQ		10.846	.066	.796	.634	18.929	.052	.942	.887

Model fit χ^2= 86.11; DF=32 (p=.000); χ^2/DF=2.69; GFI= .952; AGFI= .891; CFI= .984; RMSEA= .065
Indicates significance at a level of 0.05.

perceived would lead to the higher RQ especially on trust when tourists' inertia was low. And the same results could be found on high inertia group.

Conclusion

Findings show that destination image can positively and significantly impact relationship quality. This implies the better images of landscape, destination brand, culture, and entertainment of the destination a tourist perceived would have higher probabilities to lead to the greater satisfaction, trust, and commitment relationship with the service provider. Specifically images of landscape and destination brand a tourist perceived were the key antecedents on influencing satisfaction, trust, and commitment relationship with the service provider. This finding has filled up the gap of previous studies that none of the studies point out which factor was the key to leisure farming. One of the possible suggestion to the managers was the training of the staff should be well done especially for those front ones. They should keep smile and friendly when they were host to the guests based on the interview from some of the respondents.

Furthermore, inertia was expected to play a key moderating role in forming relationship quality because of the following empirical evidences. First, although there is little research that specifically examine the moderating impact of inertia, a considerable amount of research have provided an empirical evidence that individuals who more easily feel inconvenience or hassle for searching alternatives bookmark a specific favorite provider and tend to buy its product or service repeatedly without many goal directed behaviors, conscious determination, favorable attitudes toward the provider, or satisfactory cognitive and emotional experiences (Anderson and Srinivasan, 2003; Beatty and Smith, 1987; Lee et al., 2001; Yanamandram and White, 2006).

In the present study, that the effects of destination image on relationship quality depend on the magnitude of inertia in the leisure farming context was evidenced. Some components of destination image should play a greater role when inertia is high and a lesser role when inertia is low was also found. This indicates relax image was important factor in predicting tourist-service provider relationship quality in low inertia group. When the inertia was high, image of nice man would be the key in influencing relationship quality. Specifically the better destination image could mainly lead to the higher trust relationship of a tourist for both low and high group. This indicates the better destination image could foster a tourist's feeling of trust, trustworthy impression, confidence of the service and products' price. One suggestion to the manager could be found that the reliability of the service operation should keep in a stable status and the price of agro-products should be honest offered by the respondents.

In line with previous studies, researchers agree that inertia can act as an inhibitor to switching, which implies this variable is a psychological barrier to switching (Colgate and Lang, 2001; Han et al., 2009; Jones et al., 2000; Yanamandram and White, 2006). These researchers insist that psychological switching barriers (which are closely related to inertia), along with financial/monetary barriers, have a moderating role in customers' decision-making processes and post-purchase behaviors. However, inertia was found to be a moderator in shaping relationships between tourist and service provider. On the other hand, the better images would lead to the greater relationship due to the higher inertia. Inertia was an inhibitor to switching when the image-relationship quality relationship was considered only. When tourists have a high level of inertia, they tend to buy a certain product repeatedly because switching is too bothersome in that it necessitates various investments of effort and time; satisfy with the service provider, feel loyal to the service provider, and the confidences of the tourists to the service provider would be declined. Consequently, they tend to remain the relationship with the service provider and the whole evaluation to the service provider would become greater.

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PIPING FAILURE INDUCED BY SHEAR BANDINGS: TAKE THE RENYITAN RESERVOIR SPILLWAY AS AN EXAMPLE

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Abstract

In light of the difficulty in determining the actual cause of spillway piping failure by using traditional seepage analysis, the authors of this paper have investigated the cause of piping failure of Renyitan Reservoir spillway by using a shear band model surrounding the spillway and the equation of the critical bottom velocity v_{bc} of particles required by initiating piping failure. The result has revealed that the piping failure of spillway is caused by shear bandings. Therefore, it is suggested that shear bandings should be continuously monitored in dam area for safety assurance.

Keywords: piping, spillway, seepage, shear bandings, critical bottom velocity.

Introduction

The construction project of Renyitan Reservoir was completed in 1986. As shown in Figure 1, the spillway is located on the ridge of southwest side. In Figure 2 it appears that the spillway is formed by backfill of river valley on the

ridge. The onsite image of this spillway is as shown in Figure 3.

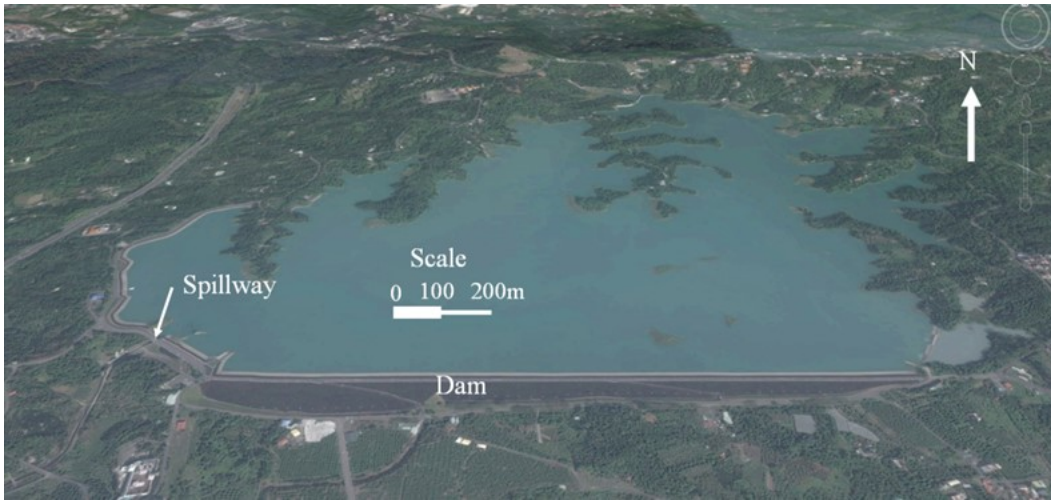


Figure 1. Dam and spillway of Renyitan Reservoir (Google Earth, 1016)

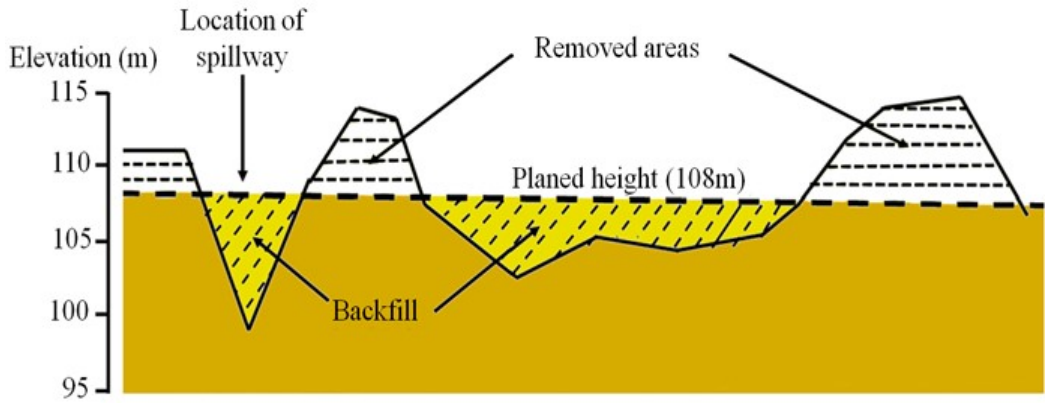


Figure 2. Cross sectional profile of Renyitan Reservoir spillway

Figure 3. Onsite image of Renyitan Reservoir spillway

Piping failure was found in Renyitan Reservoir spillway on September 2, 2013. Even though the managing authority continued to commission seepage analysis, groundwater level monitoring, ground penetrating radar detection, and onsite test of water leakage source to academic institutions and consulting firms, the exact cause of piping failure with maximum particle size reaching 35cm still could not be figured out.

Therefore, further researches become rather important to the repair work after piping failure.

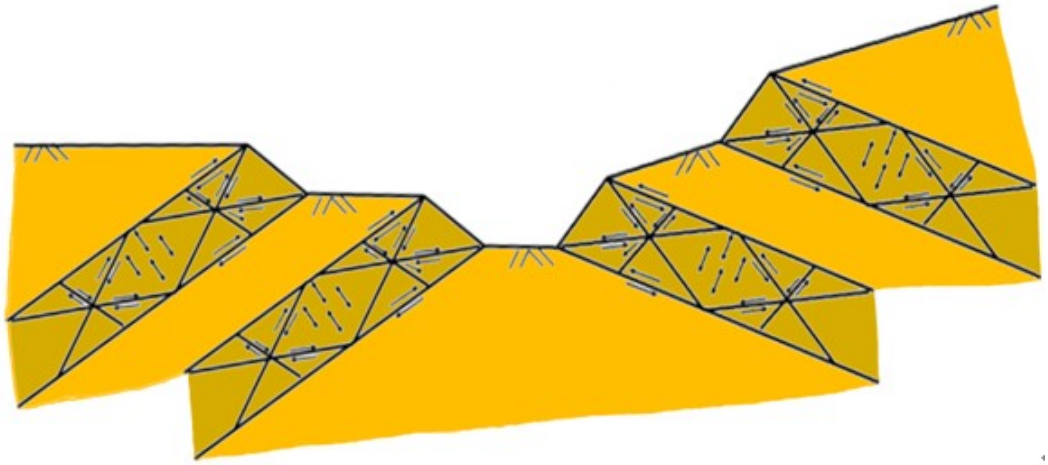
Piping failure was defined by Terzaghi and Peck (1967) as “Many dams on soil foundations have failed by the apparently sudden formation of a pipe-shaped discharge tunnel located between the soil and the foundation. As the stored water rushed out of the reservoir into the outlet passage, the width and depth of the passage increased rapidly until the structure, deprived of its foundation, collapsed and broken into fragments that were carried away by the torrent. An event ofthis type is known as a failure by piping.”

For the compacted soils underneath the bottom plate of spillway and the foundation of sidewall, the pipe-shaped discharge tunnel mentioned by Terzaghi and Peck (1967) cannot be formed without any shear texture.

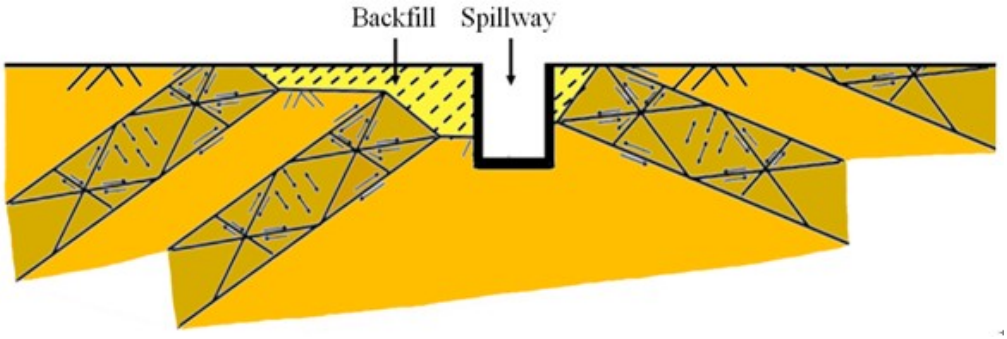
Therefore, the authors of this paper proposed a shear band model in those areas near the spillway at first. Then by introducing the impacts of shear bandings during 1022 Chiayi earthquake on fractures, relative displacements, and bending deformations of Renyitan Reservoir spillway, it was confirmed that water can flow from fracture zones of bottom plate into shear band soils underneath. Finally the equation of the critical bottom velocity for particles to cause piping failure derived by Hsu, et al. (2014) is adopted to speculate the possibility of $v_b \geq v_{bc}$, thus providing possible cause of piping failure of Renyitan Reservoir spillway.

The Proposed Shear Band Model In Those Areas Near The Spillway

With lateral compression of a plate, once the shear strain has gone deep into the plasticity range, the localizations of deformations will result in shear bandings (Rice, 1977; Rudnicki and Rice, 1975). Since shear bandings will lead to lifting of a plate, in this paper the authors have proposed a shear band model in those areas near the spillway as shown in Figure 4.



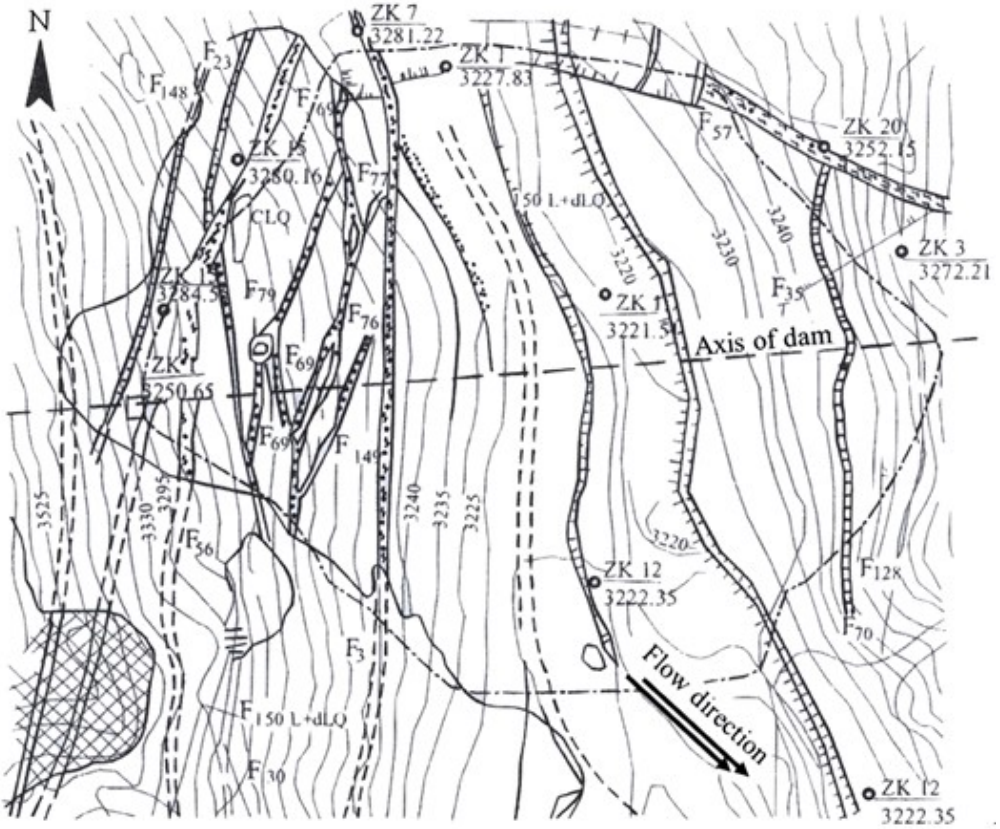
(a) Before construction



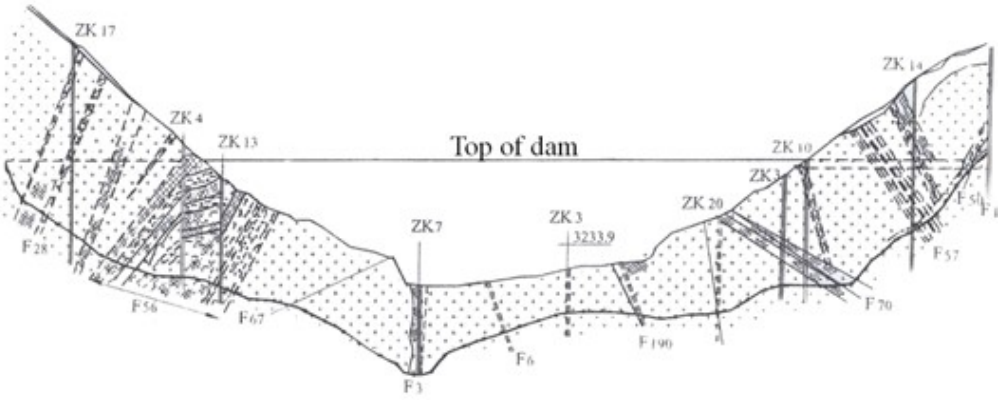
(b) After construction

Figure 4. The proposed shear band model in those areas near the spillway

Shear bands will be propagated due to felt earthquakes or periodic rising-drawdown of water in a reservoir, and the shear band soil will be continuously worsened, thus gradually forming a piped-shape discharge tunnel. However, engineers often overlook the existence of shear bands at design stage or the operation stage after completion of construction, and they ended up paying significant prices for it. Take the Gouhou Dam in China as an example. More than 10 faults or shear bands were found at the bottom of the dam after the occurrence of piping failure of dam body (as shown in Figure 5). Some of these faults or shear bands were extended toward dam body. After rising water level in the reservoir, piped- shape discharge tunnels were formed in the intersection of faults or shear bands with different strikes (as shown in Figure 6).



(a) Plane view



(b) Cross sectional profile

Figure 5. Faults or shear bands exist around the Gouhou Dam
(Sinotech Foundation for Research and Development
of Engineering Sciences and Technologies, 2008)

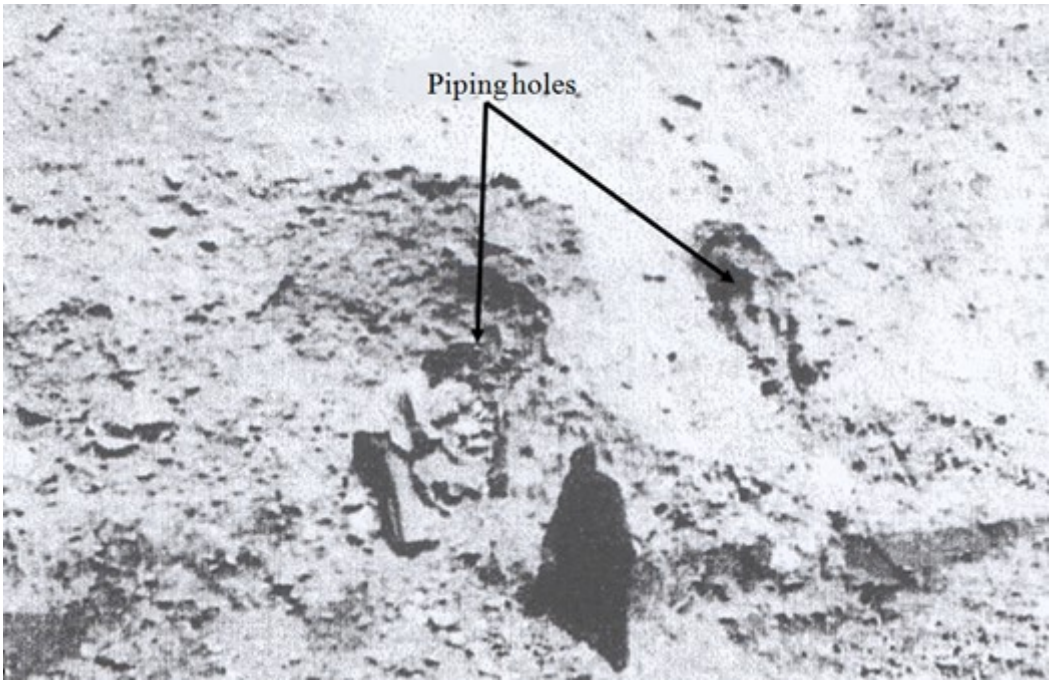


Figure 6. Piped-shape discharge tunnels formed in the Gouhou Dam
(Sinotech Foundation for Research and Development
of Engineering Sciences and Technologies, 2008)

The Impacts Of Shear Bandings On Renyitan Reservoir Spillway

The cross sectional profile of Renyitan Reservoir spillway is as shown in Figure 7, in which it appears to be a gate-controlled spillway of the width is 9m, the slope is 25°, the design flow rate is 75cms and the elevation for top of weir is 102.5m. The maximum flow velocity will be continuously increased from 6m/sec at the rear end of weir to 22m/sec at the bottom of spillway.

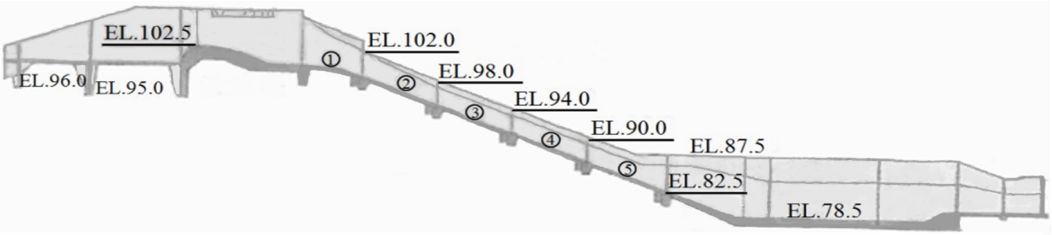


Figure 7. Cross sectional profile of Renyitan Reservoir spillway

1022 Chiayi Earthquake took place in Taiwan in 1999 with M_L=6.4. In this earthquake, the recorded horizontal peak ground acceleration is 993gal at the intersection of southwest ridge and right shore of dam body as shown in Figure 1.

By using the horizontal displacement velocity vectors of 1022 Chiayi Earthquake, six shear bands with different strikes are identified as A, A', B, B', C and C' as those shown in Figure 8.

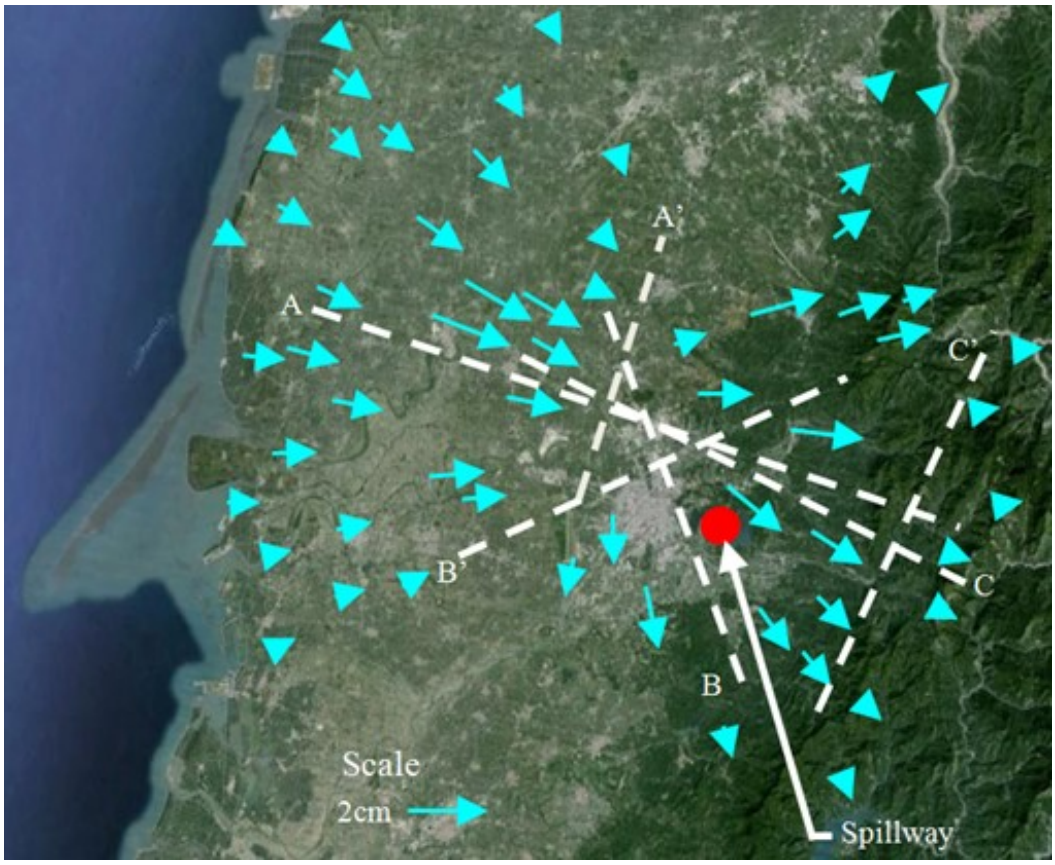


Figure 8. Horizontal displacement velocity vectors and shear bands induced by 1022 Chiayi Earthquake (Wang, 2007; Google Earth , 2016)

Shear bands of same strike will appear in groups, such that the shear bandings in parallel during 1022 Chiayi Earthquake could pose certain impact on Renyitan Reservoir spillway thus causing fracturing of bottom plate (as shown in Figure 9), bending of sidewall (as shown in Figure 9), and relative displacements of sidewall (as shown in Figure 10).

Figure 9. Fracturing of bottom plate and bending of sidewall

Figure 10. Relative displacement of sidewall

Piping Failure Phenomenon Of Renyitan Reservoir Spillway

Taiwan was hit by Typhoon Kong-Rey on August 29, 2013. With the constant impact of torrential rain induced by southwesterly airstream, the piping failure of Renyitan Reservoir spillway took place on September 2, 2013 with the water level of reservoir at 104.75m. Figure 11 shows the sixth bottom plate of spillway was ruptured and uplifted and particles of different sizes left in stilling basin. These particles came from the soils beneath bottom plate and sidewall foundation, and some of them came from the backside of the wall, thus leading to a big piping hole as that shown in Figure 12.

Figure 11. Particles flowing out of Renyitan Reservoir spillway

Figure 12. A big piping hole formed at the backside of the wall after piping failure

After piping failure of spillway, seepage water passing through south-west ridge was still flowing in the fractures areas of bottom plate and sidewall foundation (as shown in Figure 13), yet this kind of seepage water is not equipped with sufficient flow velocity to cause the piping failure of cobble or boulder, thus proving that the seepage water running through the ridge is not the main cause of piping failure of spillway.

Figure 13. Seepage water flowing out from beneath the sixth bottom plate

After the removal of third to sixth bottom plates during repair process, first of all a significant amount of soil loss was found beneath third to sixth bottom plates (as shown in Figure 14), and beneath the foundations of second and third sidewalls on the left shore (as shown in Figure 15). Secondly, with the gate being closed during repair process, it is shown in Figure 14 and Figure 15 that soil surrounding the outlet passage of piping failure was gradually air dried, and this phenomenon can prove that the water source of piping failure was mainly from the flood discharged from weir towards downstream after the gate was opened.

Figure 14. The loss of soil beneath the bottom plate of spillway

Figure 15. The loss of soil beneath the sidewall foundation of spillway

Shear Textures Existing In Soils Beneath Bottom Plates And Sidewall Foundations

As for the soils left at the site after piping failure, even with the rather insignificant degree of shear banding, the main deformation shear D, propelling shear P, Riedel shear R, conjugate Riedel shear R', and compression structure S existing within the total width of a shear band can still be identified as those

shown in Figure 16 and Figure 17.

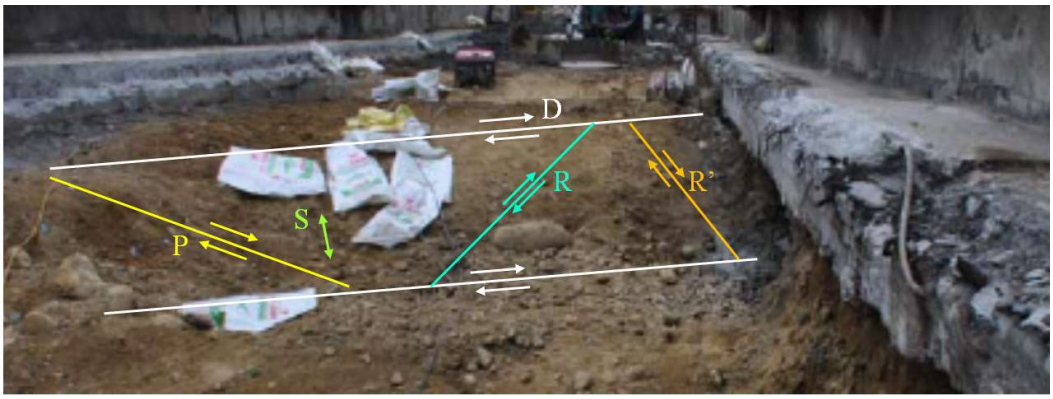


Figure 16. Shear textures existing in the soil beneath bottom plates

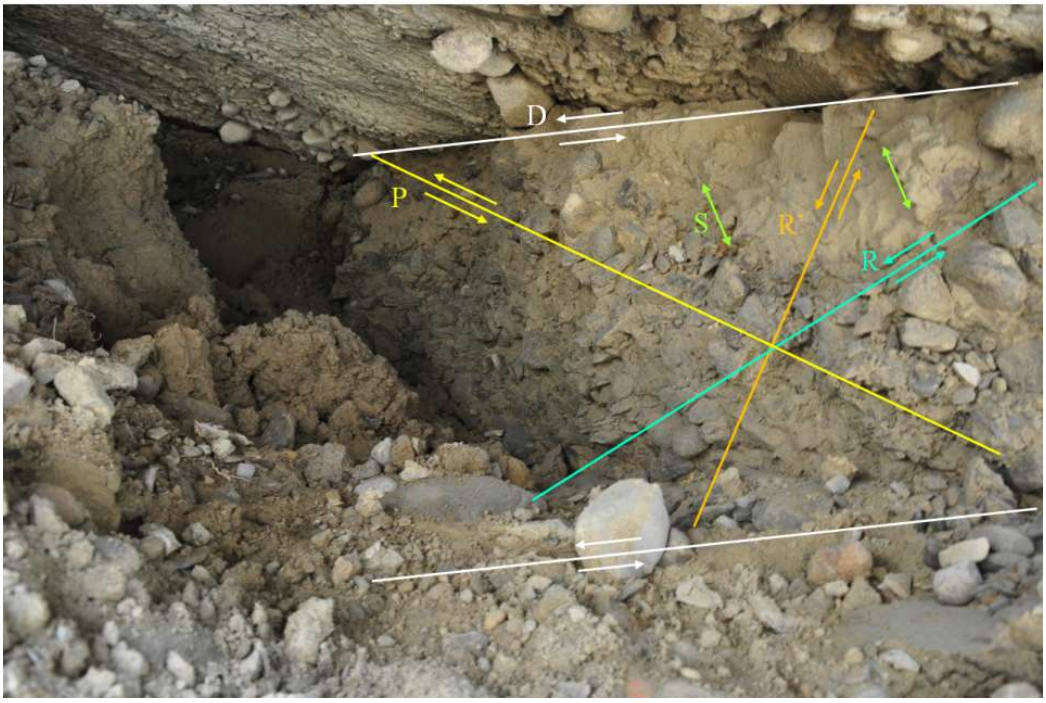


Figure 17. Shear textures existing in the soil beneath sidewall foundations

The Critical Bottom Velocity Of Particle Required For Initiating Piping Failure

As for the bottom plate and side-wall foundation of Renyitan Reservoir spillway with slope of β equal to 25°, it

was very surprised to found that the reinforcing steel bars were not equipped in the anti-slip blocks. As a result, after the rupturing and uplifting of the sixth bottom plate and sidewall foundation, other bottom plates and sidewall foundations were all sliding towards downstream, which has worsened the fractures of bottom plates and sidewall foundations. Then the discharged flood is much easier to flow into the shear band soils, thus forming a piped-shape discharge tunnel with increased height and width, and it is possible for cobbles and boulders to be carried away by torrent along the outlet passage.

As for the granular soil in a piped-shape discharge tunnel, the equation proposed by Hsu, et al. (2014) can be used to analyze the critical bottom velocity v_{bc} of particle required for initiating piping failure:

$$v_{bc} = \sqrt{\frac{2g(G_s - 1)}{1+e}} \cdot \sqrt{D} \cdot \cos\beta \quad \text{..... (1)}$$

where g is the acceleration of gravity, G_s is the specific gravity of soil, D is the diameter of soil particle, e is the void ratio, and β is the slope angle. Take Renyitan Reservoir spillway as an example, for the particles left in stilling basin after piping failure, if void ratio e is increased from 0.5 to 1.0 during shear banding and particle diameter D is taken from 0.0001m to 0.35m, the critical bottom velocities v_{bc} can be determined as those shown in Table 1.

Table 1. The critical bottom velocities for initiating piping failure of soil particles with different void ratios and diameters (G_s = 2.65)

D(m)	v_{bc} (m/sec)		
	e=0.5	e=0.75	e=1.0
0.0001	0.042	0.039	0.037
0.0005	0.095	0.087	0.081
0.001	0.133	0.123	0.115
0.005	0.297	0.276	0.258
0.01	0.421	0.389	0.365
0.05	0.972	0.871	0.816
0.10	1.331	1.233	1.153
0.35	2.491	2.306	2.157

The Cause Of Piping Failure Of Renyitan Reservoir Spillway

In addition to bottom plate fracture, the shear bandings also resulted in displacement of expansion joint and central line (as shown in Figure 18) and fracture of sidewall foundation (as shown in Figure 19).

Figure 18. Displacements of both expansion joint and central line

Figure 19. Fracture of sidewall foundation

As for the 20cm thick spillway bottom plate with unit weight at 23.54kN/m^3, when water flows into the shear band soil from the fractured areas of bottom plates and sidewall foundations, localized uplift was found at the sixth bottom plate and sidewall foundation with head of water greater than 0.48m, and the buckling rupture was induced by excessive uplift force as shown in Figure 10.

As for the shear band soil beneath bottom plate or sidewall foundation of Renyitan Reservoir spillway with slope equal to 25°, Table 1 has revealed that the v_{bc} required for initiating piping failure is reduced by 13.4% along with worsened fracture and the void ratio e increased from 0.5 to 1.0; with void ratio equal to 0.5, the v_{bc} required for initiating piping failure will be increased from 0.042m/sec corresponding to D=0.0001m to 2.491m/sec corresponding to D=0.35m.

After the degree of fracture was increased in the shear band soils and when the velocity of flood entering shear band soil reached 0.042m/sec, a piped-shape discharge tunnel was formed after the soil fines with particle diameter D≤ 0.0001m was lost. This phenomenon can be proved by the holes distribution obtained from the detection by ground penetrating radar as shown in Figure 20. Later on, the width and height of outlet passage were increased along

with continuous increase of water flow velocity. As for the largest particles resulted from piping failure with particle size of D=0.35m, it is shown in Table 1 that the v_{bc} required for initiating piping failure is 2.491m/sec; generally speaking, it is possible for this kind of water flow velocity to be found in the outlet passage.

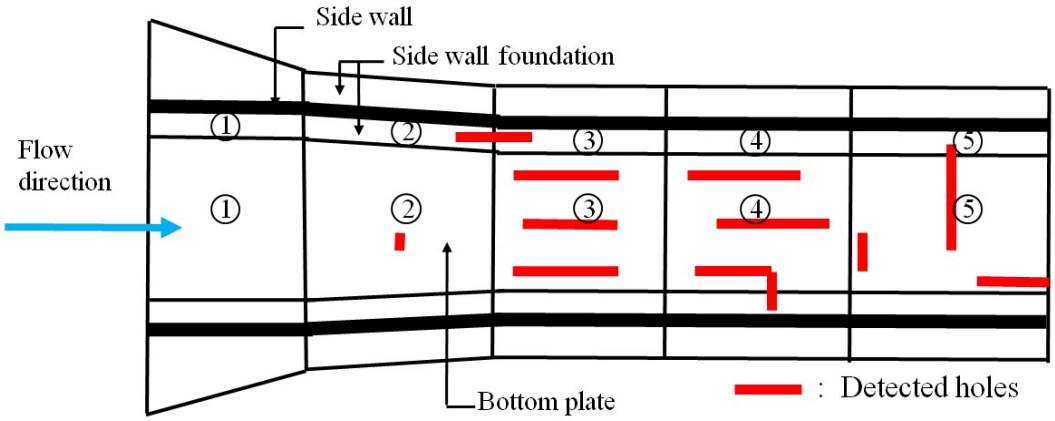


Figure 20. Distribution of holes in soils of bottom plates and sidewall foundations (reproduced from Water Resources Agency, Ministry of Economic Affairs of Taiwan)

The summary of aforementioned research results has revealed that the piping failure of Renyitan Reservoir spillway was caused by the bottom plate fractures, sidewall displacement, and bending deformation of sidewall resulted from propagated shear bandings reaching into the spillway. Some of the discharged flood entered the shear band soil beneath the bottom plate and sidewall foundation along the fracture zones; with the bottom plate not equipped with anti-slip reinforcing steel bars, after the rupture of the sixth bottom plate and sidewall foundation, the further sliding of other bottom plates and sidewall foundations worsened the fractures in fractured zones, thus increasing the flow velocity of water entering shear band soil. Piped-shape discharge tunnels were formed (refer to Figure 21) after the loss of soil fines with rapidly increased width and height, such that the particles with diameter D as large as 0.35m could be carried away by torrent in outlet passage. As the space of outlet passage underneath the sidewall foundation got larger and larger, the soil on the backside of wall was gradually collapsed and carried away by torrent in the outlet passage thus forming a big hole there.

Figure 21. Piped-shape discharge tunnels formed underneath the bottom plate of Renyitan Reservoir spillway

Conclusions And Suggestions

Even though the managing authority continued to perform seepage analysis and various onsite testing and monitoring plans after the piping failure of Renyitan Reservoir spillway, the actual cause of this piping failure could not be effectively identified. Therefore, in this paper the authors first established the shear band model surrounding the spillway, which has been used to investigate the cause of bottom plate fracture, sidewall displacement, and sidewall buckling deformation of spillway induced by shear bandings surrounding Renyitan Reservoir spillway during 1022 Chiayi Earthquake. Later on the analysis of the v_{bc} required for initiating piping failure was carried out based on onsite conditions, discharged particles after piping failure, and the equation adopted by the authors in order to reveal that shear textures surrounding the spillway were propagated towards bottom plate and sidewall foundation soils of spillway during 1022 Chiayi Earthquake. The piped-shape discharge tunnel was then gradually formed. The continuously increased width and height and the water flow velocity in the outlet passage gradually increased to the v_{bc} corresponding to D equal to =0.35m were determined to induce the piping failure of Renyitan Reservoir spillway.

Based on aforementioned conclusions, the authors suggest that, in addition to seismic monitoring based on various existing instruments, countries in seismic zone should also establish the monitoring array with respect to shear bandings in order to figure out the locations of shear bandings surrounding the reservoir and the continuously accumulated velocities of shear bandings, based on which the phenomenon of weakened reservoir safety along with the increasing velocities of shear bandings can be determined. This is how we can prevent piping failure from jeopardizing the safety of reservoir.

Acknowledgements

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International Journal of Organizational Innovation

IDENTIFICATIONS OF THE KEY IMPACTING FACTORS ON HOTEL WORKERS' BURNOUT: A COMPARISON OF RAGIN'S FSQCA AND PLS-SEM ANALYSIS

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Abstract

The aim of this study is to examine factors related to employee burnout in frontline jobs in tourism hotel. A conceptual model was developed and tested using both variable-based statistical analysis (PLS) and case-based algorithm (fsQCA) on a survey in which 195 hospitality frontline employees participated. The findings show that employee burnout is closely linked to employees' emotion labor and task-induced stress during services with

customers. Accordingly, the study clearly reveals the importance of employees' emotion regulations. The study has demonstrated the importance for managers of having a pleasant workplace to reduce employees' burnout. In particular, it is important for managers to notice that task-induced stress and emotion labor are major drivers to job burnout. Consequently, one general and key practical implication from this study is the importance for mangers to provide assistance on a regular basis to their employees at workplace.

KEYWORDS: Burnout. FsQCA. PLS. Hospitality Services. Management Strategy

Introduction

Hospitality is a highly stressful industry (Tsaur and Tang 2012; Kim et al. 2007). Among them, hotel frontline workers are required to regulate themselves to serve customers properly. The task-induced pressure often leads to burnout (Zhao and Mattila 2013). However, the factors affecting hotel frontline workers' burnout are still inconclusive.

This study compared two types of analyses, one variable-based dominant-logic strategy of statistical modeling (PLS), the other, case-based algorithm (fsQCA) to identify the key impact factors on burnout using Job demands-resources model. Apart from previous studies, this article discusses the benefits of using these complementary approaches and demonstrates the good uses of both methods. The analyses in the study deepen the understanding of the benefits resulting from modeling and the use of information while using these two approaches (Woodside et al. 2013).

Job Demands-Resources Model

The job demands-resources theory assumes that each occupation may have its own specific risk factors associates with motivation and job stress, and the factors can be classified into two general categories: job demands and job resources (Bakker and Demerouri 2007; Bakker and Demerouri 2014; Crawford et al. 2010). Job-demands refer to three physical, social or organization aspects of the job that require sustained physical or mental effort and therefore are associated with certain psychological costs (e.g. exhaustion) and including aspects such as workload, time pressure, and difficult

physical environments. Job-resources, on the other hand, refer to those aspects of the job that are functional in achieving work goals, stimulate personal growth and development, and reduce job demands and their associated psychological cost and include aspects such as job control, work social support, participation in decision making (Maslach et al. 2001). Together, the job demands-resources (JD-R) model assumes these two constructs explain the relations with burnout (Bakker and Demerouri 2007; Schaufeli and Bakker 2004). Job demands are assumed to have a direct positive relationship with burnout and job resources are assumed to have a direct negative relationship with burnout (Schaufeli and Bakker 2004).

Although the JD-R model clearly predicts the high job-demands lead to burnout and a rich job-resources workplace decreases burnout, the key impacting factors to hotel worker's burnout are not clear. Based on the knowledge from literature, we classify hotel workers' job demand factors as work load, emotional demands and customer service delivery and job resources as supervisors' support, co-workers' support, and task autonomy. According to Maslach et al. (1996), burnout can be classified as emotional exhaustion, dehumanization and low self-efficacy .We then use JD-R model to clarify the relationships between job demands-resources and burnout among hotel frontline workers.

Hypothesis 1*: Job demands are positively associates with burnout.*

Hypothesis 2*: Job resources are negatively associates with burnout.*

Methodology

Participants and Procedure

In this study, data were collected from the frontline employees who work in the tourist hotels in Taiwan. The participants should be frontline employees and who worked in housekeeping, food service and on front desks. Questionnaires were distributed to human resources managers in hotels when the 195 valid questionnaires were collected. Among those respondents, most of them were between the ages of 21 and 40 (94%). More than 87% held a bachelor's degree and had at least one to two years of work experience (75.3%). The employees

worked in food service (44.6%), housekeeping (16.4%) and on the front desk (20.3%).

Measurements

All questionnaires were available in Traditional Chinese, the official language used in Taiwan. Items were scored on 5-point Likert scales ranging from 1= ‘‘strongly disagree’’ to 5 = ‘‘strongly agree’’. Scale scores were computed as the mean of the items.

Job demands.

With respect to job demands, based on Grouth et al. (2009), workload was assessed with 5 items in sample 1, such as “ There are too many tasks to be completed within working hours“, customer service load was assessed with 6 items in sample 2, such as “I feel bad when the customer treats me with no respect”, emotion labor was assessed with 4 items in sample 3, such as “I just pretend to have the emotions I needed to display to this customer”, Cronbach’s $\alpha_{sample1}$=.84, $\alpha_{sample2}$=.82, $\alpha_{sample3}$=.81.

Job resources.

Based on Schaufeli and Bakker (2004), supervisor’s support was assessed with 5 items in sample 1, such as “My supervisor(s) love(s) to take our suggestions into considerations”. Coworker’s support was assessed with 7 items in sample 2, such as “When I am busy, my coworker(s) always help me”. Autonomy was assessed with 4 items in sample 3, such as “During work, I can decide how to treat customers by myself”. $\alpha_{sample1}$=.92, $\alpha_{sample2}$=.92, $\alpha_{sample3}$=.81.

Burnout.

Based on Maslach Burnout Inventory (1996), emotional exhaustion was assessed with 4 items in sample 1, such as “I have a sense of inner emptiness”, dehumanization was assessed by 4 items in sample 2, such as “I lose the passion for work”, low self- efficacy was assessed 4 items in sample 3, such as “I feel frustrated at work”. $\alpha_{sample1}$=.84, $\alpha_{sample2}$=.85, $\alpha_{sample3}$=.71.

Hypothesis Testing

We performed symmetric statistical tests using partial least squires (PLS, Pirouz, 2006) regression analyses and the asymmetric algorithm construct testing was tested by the software program fsQCA (fsQCA = “fuzzy set Qualitative Comparative Analysis”). PLS analyses use true scores from the questionnaires, whereas fsQCA uses calibrated scales.

The calibrated scores range from 0.0 for full non-membership to 1.00 for full membership. The fsQCA program provides calibration function to convert true scores into calibrated scores. To perform the fuzzy-set calibration, criteria are necessary for three breakpoints -0.05 for threshold for full non-membership; 0.50 for the crossover point of maximum membership, and 0.95 for the threshold of full membership (Ragin 2008; Woodside et al. 2013). Specifying the original values for these three breakpoints and the program calibrates all remaining scores. For this study, the following procedure was used to calibrate the original multiple-value scales. Scores for cases in the highest quintile equal 0.95 (5 in original scale); calibrate scores for cases in the middle quintile were set at 0.50 (3 in original scale); calibrated scores for the cases in the lowest quintile were set at 0.05 (1 in original scale).

Predictive Validity and Reliability of the Data in the Analyses

Before the hypotheses could be investigated, each construct was assessed for reliability and validity. This research tests for predictive validity and reliability of the models for both statistical analysis and QCA findings. Internal consistency reliability was performed using SPSS software, and the Cronbach's α for each construct was listed in Table 1 and Table 2. All constructs meet the requirement of internal consistency reliability. The validity tests were performed using PLS. We used SmartPLS (www.smartpls.de) software to test the validity of data sets.

The loadings of all the PLS's analysis's reflective indicators were examined to indicate reliability. The item of loadings ranged between .588 and .924. Therefore, no item was deleted. To check how well the reflective constructs are measured by their assigned indicators, internal consistency metrics (Cronbach's alpha and composite reliability) can be used. Table 1 indicates Cronbach's alpha (α), composite reliability (ρ), and average the average variance explained (AVE). All common thresholds were met for construct reliability in accordance with the number of indicators. Discriminant validity was satisfied (Table 2), with the correlations between the homogeneity of the constructs less than the square root of the average variance extracted (AVE).

Table 1: Internal consistency of reflective constructs

Construct	Cron. Alpha(α)	Comp Rel(ρ)	AVE
WL	.844	.886	.567
CS	.788	.862	.559
EL	.813	.877	.641
SS	.912	.934	.740
CSS	.907	.925	.640
TA	.794	.863	.679
BO	.788	.904	.825

Note: WL: work load, CS: stress from customer service, EL: emotion labor, SS: supervisor's support, COS: coworker's support, TA: task autonomy, BO: burnout

Table 2: Discriminant validity of constructs

Construct	WL	CS	EL	SS	CSS	TA	BO
WL	.753						
CS	.565	.748					
EL	.410	.536	.801				
SS	-.311	-.200	-.142	.860			
CSS	-.274	-.187	-.105	.401	.800		
TA	-.032	.095	-.025	.180	.135	.806	
BO	.547	.492	.454	-.234	-.314	-.068	.908

Note 1: WL: work load, CS: stress from customer service, EL: emotion labor, SS: supervisor's support, COS: coworker's support, TA: task autonomy, BO: burnout.

Note 2: diagonals represent the average square root of the average variance extracted, others represent the correlations.

Results

Results from PLS

According to Chin (1998), the PLS modeling includes testing the measurement model and the structure model. The test for measurement model was performed and present in previously section. All items meet the requirements of reliability and validity. The weights of the burnout indicators were obtained through PLS estimation. The indicators' weights (path coefficients) and their

bootstrap t statistics are presented in Table 3. In the findings, workload, stress from emotion labor contribute to burnout with path coefficients of .314 (medium) and .214 (weak) and support from coworkers decrease burnout with a path coefficient of -.168 (weak). The explanatory power R^2 is .41. According to Hair et al. (2014), the JD-R model explains 41% of burnout, which is medium explanatory power, suggesting the JD-R model predicts in a medium level of burnout.

Results from the fsQCA

This study first examined the consistency and coverage of each causal factor to the outcome (burnout). In order to perform the analyses, all income variables (the JD-R variables in the model) were calibrated into fuzzy scores. Next, the predictive validity was tested in the fsQCA program. Table 4 presents the consistency between each predictive variable and burnout. According to Woodside et al. (2013), only work load, stress from customer services and emotion labor meet the consistency requirement (consistency >=.70). Therefore, job resources related variables were dropped from the recipe. The next is to calculate all alternative sufficient and necessary conditions that lead to the outcome. We allow the remaining factors to enter into the recipe, namely, to use workload•customer service•emotion labor to predict burnout ("•" represents logical "AND" relationship). Table 4 shows the test results from the fsQCA. The findings in table 4 provide 3 recipes for outcome that is emotionlabor * ~load+ customer * ~load+ emotionlabor * customer <= burnout ("+" represents logical "OR" relationship, "~" represents the negation of the antecedent condition). The findings suggest emotion labor could be the major impacting factor on hotel worker's burnout.

Discussion

In this study, we investigated two hypothesis testing techniques using variable-based statistical analyses and Boolean case-based algorithm. Results from PLS and fsQCA all indicate the support from supervisors does not help to reduce hotel frontline workers' burnout. This result is not surprising since most of them have less assistance from supervisors during night shift. In addition, task autonomy does not play as a buffering factor in the decrease of burnout since most the frontline employees mostly do not have much task autonomy. As for coworkers' support, the

Table 3: Path coefficients of PLS model

Hypothesis	Path coefficient (weight)	t-value
Workload→Burnout	.314	3.65*
Load from customer service → Burnout	.174	1.815
Emotion labor→ Burnout	.214	2.606*
Supervisor's support→ Burnout	.0004	.063
Coworker's support→ Burnout	-.168	2.723*
Autonomy→Burnout	-.047	.699

*: significant

Table 4: Consistency between each predicting variable and burnout

variable	consistency	variable	consistency	variable	consistency
load	.836	customer	0.735	emotion labor	0.760
manager	0.602	coworker	0.564	autonomy	0.474

Table 5: Models' predicting burnout

assumptions:	raw coverage	unique coverage	consistency
emotion labor*~load	0.733	0.049	0.824
customer*~load	0.740	0.056	0.815
emotion labor*customer	0.829	0.146	0.831
	solution coverage: 0.93		
	solution consistency: 0.75		

findings PLS and fsQCA are not consistent. Results from PLS suggest the support from coworkers may reduce the stress from job demands, hence decrease burnout. However, the findings from fsQCA do not support the same concept.

Reasons could be the absence of nearby coworkers especially during night shift.

Conclusion

The original design of this study was to use PLS modeling to verify the impacting factors on hotel frontline employees' burnout. By using alternative case-based algorithm, this technique serves as a complementary method to identify key impacting factors and also confirm the findings from PLS modeling. In

conclusion, we identify the key impact factors of hotel frontline workers' burnout as workload and emotion labor.

Recommendations

In this study, the burnout driving factors were identified. The managers should be aware of these driving factors. Since most hotel frontline workers suffer from overload and emotion labor, the managers should be aware of the factors and reduce the workload of employees. In addition, workshops can be offered to provide useful skills for employees to reduce emotion labors.

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COOPETITION, CLUSTER EXTERNALITIES AND COMPANY PERFORMANCES: FORMATION FOR COMPETITIVENESS OF THE WOOD AND RATTAN FURNITURE INDUSTRY

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Abstract

Coopetition in high level is a main determinant in effort to increase competitiveness clusters. It takes at least phase clusters have formed maturity cycle. Maturity stage materialized in the form of increasingly the cooperation between companies in these clusters. It is based on the findings of research that cluster can make to developed agglomeration. Highly cooperation and competition (coopetition) among entrepreneurs in the same cluster is an ultimately signal, in which an industrial cluster prepare to extended form. Characteristics of clusters that meet those criteria most importing in an affecting to the formation of more complex clusters. The final formation is agglomeration economy, in which the creation of an integrated system of supply chain industry from downstream to upstream.

This study used 124 companies in small and medium-scale of wood furniture in Jepara (Central Java) and industrial cluster of rattan furniture in Cirebon (West Java). The sampling technique purposive sampling method. Technically withdrawal of data using questionnaires, interviews, and focus group discussion (FGD). Analysis of data using stages multiple linear regression.

This study shows evidence that coopetition affect the cluster externalities. Companies that only emphasizes the cooperation among cluster members cannot create knowledge spillover in the form of either cluster externalities associated with access to technology, access to capital, access and joint marketing, institutional access and access to the supply chain. Likewise, with companies that emphasize competition among the members of

cluster also has no impact on cluster externalities. Even the implementation of the cooperation strategy with only considering competition only, may negatively affecting the cluster externalities. The impact of cluster externalities in the form of access to technology, access to capital, access and joint marketing, instit-utional access and access to the supply chain affect the company's performance.

Keywords: Coopetition, Cluster, Externalities, competitiveness, company performance

Background

Industrial grouping within a cluster can generate profits of industrial agglomeration. People and companies will benefit from production activities and innovation neighboring companies in the same industry and related. Grouping is an important way for companies fulfill their competitive advantage and increase the competitiveness of the region and nationally. This proof has encouraged local policies towards the promotion of clusters. However, the support cluster policy caused controversy, because the perspective of traditional recommending optimal policies to subsidize companies clusters generate externalities. While the company makes use of the rhetoric of competitiveness policy inspired competitive advantage. This paradox presents a model, which proves that despite the vast amount of externalities is the traditional approach of comparative advantage that should guide the competitive policies. The research findings Pessoa (2011) showed that regional cluster must considering many policies that it can make generate a comparative advantage and competitive advantage for each company in a cluster.

Cluster is a fundamental economic unit in modern economies and an important driver of competitiveness. The role of government in cluster-based policies will make economic policy more effective and better utilize scarce resources available.

Cluster-based policies will also promote cluster-based approaches at national and regional level (Porter, 2007) It is much perspective that combines the strategy of cooperation and competition. It have widely grown in the literature of strategy and entrepreneurship as well as related to the competitiveness of SMEs to operate in clusters. Although many academics who have understood certain issues related to industrial clusters of small, but there are only a few studies that focused on how the potentially conflicting powers in SMEs integrated as a result of cooperation and competition applied simultaneously. Research Hoetoro (2014) gives a different perspective on what is really happening in the small industrial cluster by placing the model cluster based on two perspectives of cooperation and competition.

Efforts to improve the performance of the cluster can be done by a strategy of economic developments that affect an area. Starting effectively with it be done by integrating the aim of creating a competitive advantage at the same time can also have a positive impact on the development of the other companies of the cluster environment. Several studies shows the stra-tegy of cooperation combined with

competition (coopetiton) the expected impact on the company's performance. Le Roy and Sanou (2014) showed that the three strategies (aggressive, cooperative and coopetitive) differ significantly. The company's performance depends on the strategy, aggressive, cooperation and coopetition, which adopted its competitors. Coopetition require different aspects of alliance management system depends on the trust and reliance kombinansi. Trust or dependency environment that encourages high coopetition relationship and high performance. (R. B. & V. Bouncken Fredrich, 2012)

The existence of an established cluster that is indicated by the coopetition can also encourage the growth of new businesses or new entrepreneurs. The new regional industry will emerge in a strong group. Research finding of Delgado (2014) showed that some types of externalities would arise in a strong industry group, in the form of knowledge, skills, and input-output linkages.

Many factors affect the performance of SMEs both internally and externally. The dominant factor affecting the performance are internal factors, which include access to markets, access to capital, entrepreneurship skills, human resources, financial knowledge and business plans (Sudiarta, et al., 2014). While Munizu (2014) shows that finternal actors consisting of human resources, finance, production engineering and operations, and marketing aspects of the market or a positive effect on the performance of small and midle enterprises

Of the findings and study the theory, then look for a model research agreement and the ability of the competition and the establishment of externalities economy, such as the knowledge- spillovers. On the other hand, the relationship between cluster externalities based on cooperation and the partnership was expected to be able to affect the company's performance and competitiveness of the cluster itself, as well as the competitiveness of the economy of a region.

Literature Review

Coopetition is a main determinant for developing of a cluster. An established cluster is shown with a high degree of coopetition. Coopetition level in a cluster will have an impact on the externalities that ultimately affect the performance of companies in the cluster. In this study, the role of cluster externalities formed from the maturity factor coopetition then analyzed the effect on the performance of the cluster formed by the dimensions of the collective efficiency and performance of companies in the cluster.

Cluster externalities can be positive or negative can also have an impact. The impact of positive externalities in the form of clusters can ease access to capital, access to technology, access to markets, access to institutions and the establishment of the supply chain (supply chain). Positive externalities are expected to have an impact on improving the performance of companies in the cluster. The research findings cluster externalities impact on performance and efficient collective showed a significant effect, except for access to technology that does not affect the efficiency of the collective. Generally, cluster externalities positively affect the efficiency and performance of the company.

Access to Capital

Capital became an important factor in supporting the operations and business development. Ease companies in accessing capital to support business success. Sudiarta research results, et al. (2014) show that the dominant actors affect the performance of the Performance Management is the internal factors, which include access to markets, access to capital, entrepreneurship skills, human resources, financial knowledge and business plans. Most companies access to credit is still limited to the informal but few are able to access formal credit. The Government must ensure access to formal finance companies, because of easier access to credit for SMEs, it can be the engine of economic development (Essien and Arene, 2012). Similarly, empirical research of Muguchu, (2013), which indicates that there is a positive relationship between access to credit and ROA. Degan said the company's ability mengakases can permodlan positive impact on the efficiency and performance of the company.

Access to marketing cooperation

The ability of an organization to enter the market is a beginning succeed story of an organization. The company's inability to access a variety of information that makes the market the company failed to enter the market, which in turn decreased performance. Cluster externalities in the form of joint marketing capabilities also have an impact on the collective efficiency and performance of the company in the furniture cluster. It has a meaning that the higher the ability of marketing cooperation among cluster members will make operating costs more efficiently and boost the company's performance. Research findings of Fugazza and McLaren (2013) showed that the company's performance can be achieved primarily in companies that have a market network of international relations related import and export, in addition to the diversification of the production chain. Likewise with Suadiarta research (2014), market access is the dominant factor affecting the performance of companies and research Munizu (2014) show that internal actors in the form of market aspec, positively effect on the performance of small and micro enterprises

From a policy perspective, effective market access could affect the company's performance when constituted kemampauan access various permanfaat market information for the company. Therefore, the support of the existence of an established cluster become an important factor in supporting the success of the performance market access.

Access to Technology

Companies that are able to master the technology and have access to technological developments will have a competitive advantage. The findings of research conducted by Samuel, Kitheka Samson (2014) showed that the company's ability to access the technology will impact the efficiency and performance of the organization. Technology has evolved significantly and has been widely adopted in many organizations irrespective of their size. The technology that supports business operations that are used by very many

small, medium and large around the world as they try to improve operations and gain a competitive advantage. Opportunities to improve the efficiency and effectiveness can be identified through examination of the various technologies within the organization, so that the company's ability to access the technology will impact the efficiency and performance of the organization. Many organizations are quick to realize that technology is the most important resource in creating a sustainable competitive advantage. Cooperation firms in a cluster to make access relatively cheaper technology that ultimately affect the performance of the company.

Access to Institutional

Institutional access can be realized with the company's relationship with the external environment is a component of intellectual capital that provide value like company. Clarke et al, (2011) explains that the intellectual capital comprising Efficiency of Human Capital, Structural Capital Efficiency and Capital Employed Efficiency has an interest in influencing the performance of the company. With the intellectual capital, the company has a competitive advantage. The relationship is done in the form of a company's ability to build relationships with stakeholders. Relationships with various stakeholders to create knowledge that can enhance the value and performance of the company.

Bontis (2000), which states that the relationship with institutions outside the company can add value to the company. It is also in accordance with the opinion and Jorge Cabrita (2005) which describes the knowledge embedded in a relationship with stakeholders that can affect the life of the organization. Hubngan institutional organization that will result in poor performance of the company. Thus, relationships and good access to the various agencies is a good asset for a company that can create value for the company.

Access to Supply Chain

Over the past decade, one of the main themes in the literature Supply Chain Management has been the impact of integration on performance. Supply chain management (SCM) has become a valuable way possible to secure a competitive advantage and improve organizational performance. This is in line with the development of business competition is no longer between individual organizations but across the supply chain. The results also show that under the environment which is characterized by high demand and technological uncertainty higher level of integration led to an increase in performance, while under low uncertainty environment very little integration practice leads to improved performance. Thus it can be concluded that the integration of the supply chain requires a more customized approach to be successful. (Fynes, B., de Burca, S., & Voss, C. (2005)

The supply chain is the flow that continues to adjust to changes in supply and demand for products that are managed. To get the desired performance of the supply chain, companies need the ability to monitor and control its operation continuously. Implementation requires a supply chain performance measurement indicators to assess the implementation and not only see the results (Hanaa El Sa-

yed, 2013). Operational competence played a role in mediating the effect of SCM on performance. This is supported by a conceptual view of resource-based and relational strategies (Miguel and Brito, 2011).Sayed research results (2013) indicate that there is a positive relationship between the Supply Chain Management (SCM) and operational performance. From these studies we can conclude that the supply chain can Enhancing cost efficiency and performance of the company.

Company performance

The company's performance is a measure of a company's success is measured every predetermined time period. The performance of a business is a variable that is multidimensional and highly variable. The performance measures depending on the dimensions stressed or become a priority for the company. The measure-ment of company's performance get from the dimension of human resources associated with productivity, quality of work, marketing dimensions related to market share or an increase in sales, the financial dimension of efficiency and profitability, and various other dimensions.

Performance measures that are widely used small business growth (sales, market share, cash and employee) and financial performance (Wiklund, 1999). While Frank et al. (2010) measures the performance of small businesses use relative size compared to competitors in sales growth and cash flow growth. Performance measures small businesses can also be shown or identified from the company's success to create employment opportunities in the form of growth the number of employees (Rauch et al., 2005), while Fairoz (2010) use the growth in market share (market share growth) as a performance indicator.

While the most popular size in measuring the company's performance is financial performance, because the purpose of business is to create well-being of the owners are realized in the form of financial measures such as earnings or stock price. Financial performance measures can be realized in the form of return on sales, return on investment or return on equity (Awang et al., 2010). The company's performance also refers to how well the organization achieve its market-oriented and financial goal. Performance indicators developed by Soo Wook Kim (2006), namely; market share growth, return on investment (ROI), return on assets (ROA), the sales growth.

Research related to small businesses often constrained data, especially related to performance caused secrecy, poor administrative system and many other obstacles. In the face of these data constraints, the size of the performance can be performed using a perception survey manager or managers associated with the performance of the company with the scale approach on both performance measures related to profit, growth, and other performance indicators (Davis et al., 2010).

Research methods

This study take all small and medium enterprises (SMEs) data engaged in the manufacturing cluster of wood furniture and rattan in Jepara and Cirebon. The indicators measure of construct (variables) that are proxies relating to specific

indicators that are tailored to the context of the environmental condition of the wood and rattan furniture industry in Indonesia. Thus, the related measurement of externalities, referring to getting the close cooperation between the companies in the cluster creating opportunities of each company in improving the strengthening of access to business financing, access to raw materials and auxiliary (supply chain), market access (competitive prices and economies of scale), access to government , access to research institutions and business associations. The performance of the cluster refer to the dimensions of the collective efficiency and performance of the company. (Collective efficiency and the company's performance).

Analysis using Structural Equation Model (SEM), is used aims to see the strength and direction of the relationship between a set of variables coopetition related to general externalities generated by co-location and influence on the sup-ply chain of network cooperation (supply chain) and joint marketing (co- marketing), as well as global competitiveness of industrial clusters of small and medium-sized enterprises type of wood and rattan furniture in Indonesia. The proposed model testing conducted using Structural Equation Modeling (SEM) with a two step approach. In a two-step Approach to SEM, the measurement model (measurement model) first formulated and evaluated separately and then set the second step when the structural model estimated.

Result

The Role of Coopetition to Cluster Externalities

From the results, Regression analysis showed that the role of coopetition on the formation of clusters of externalities related efforts to strengthen supply chains and significant positive effect, with alpha less than 5 percent. Regression models were used to establish the influence of externalities coopetition on strengthening the supply chain with stepwise method lead to the conclusion that the dimension of cooperation and competition as coopetition forming a control variable which one of them becomes a factor for the other controllers. This is evidenced by the partial negative role, but a positive influence when incorporated in a size that is variable coopetition. These findings indicate that competition and competition will be the factors that impact negatively on the ability to strengthen the supply chain thus impacting negatively on the formation of clusters externalities.

While the influence of the dimensions of cooperation and competition partially on the cluster's ability to improve access to capital also affects negative and significant, but when both are merged into a variable coopetition be a positive influence. To view the role of externalities coopetition on the formation of clusters in terms of the ability to build cooperation among companies in clusters turned out to be a positive influence and significant. However, if viewed from two dimensions forming coopetition, namely cooperation and competition, so dominant in the formation of joint marketing, it is a competition, while the dimensions of cooperation made exclude variables.

Coopetition is a blend of cooperation and competition ability externalities can form clusters. Cluster externalities manifested in the form of capital access capability, the establishment of the supply chain, joint marketing, institutional access and access to technology. Table one show the influent of coopetition to the cluster externalities.

From the table it can be seen that the ability of firms in the cluster cooperation significant effect on the ability of technology access and institutional access. It can be seen from a regression coefficient of 1.668 and 1.820 in (sig 0.00) which showed a significant positive effect on the cooperation between the ability of the Traffic access to technology and access to good institutional relations with the relevant associations, research institutes, government or funding institutions.

Table 1. Regression Analysis of the Effect of coopetition Cluster Externalities

Independent Variables	Dependent Variables				
	Access technology	Access Capital	Market Access	Access Institutional	Supply Chain
Cooperation	(1668) *	(-0396)	(-0459)	(1820) *	(-0540) **
Competition	(-3725) *	(-1482) *	(-1867) *	(-4072) *	(-2007) *
Coopetition	(0063) *	(0026) *	(0031) *	(0068) *	(0035) *

**) P-value <1%. **) P-value <5%*

On the other hand, the ability of cooperation showed a negative impact on access to capital, marketing and supply chain cooperation. This is indicated by coefficient regression value of (-0.396); (0,459); (-0.540). These findings indicate that the research agreement were not supported can reduce the competitive ability of the company's ability to access capital and supply chain. Although the relationship is relatively small and not significant.

Analysis of the effect of competition on the company's ability to demonstrate the impact of negative cluster externalities. This is indicated by the regression coefficient value of coopetition effect on access to technology, access to capital, Cooperation and access to markets, access to institutional and supply chain of (-3.723); (-1.482); (-1.867); (-4.072) And (-2.007) with (sig <0.01). Thus the level of competition that is not balanced with the cooperation with fellow members of the cluster have an impact on the negative externalities for cluster members.

The company's ability to combine capabilities and the ability to compete and corporative *(coopetition*) may increase the traffic of access to technology, access to capital, access to markets, access to institutional and supply chain. It can be seen

from the coefficient of coopetition influence on each cluster externalities by 0063; 0.062; 0,031; 0.068 and 0.035 with (sig 0:00 <0:01). It shows the influence of positive and significant positive externalities coopetition against cluster. It can be concluded the ability of competition needs to be balanced with the ability to work (coopetition) will effectively affect the ability of capital access, co-operation and market access, access to technology, access to institutional and supply chain.

The Role of Cluster Externalities to Corporate Performance

Positive externalities an industrial cluster can affect the performance of the marketing or production performance and financial performance. Positive externalities an industry cluster allows companies find a lot of benefit from the interaction and geographic proximity and the location (co-location). Its form of benefit enhanced reputation (credibility) of the company and its products, access to purchase semi-finished goods from the company's suppliers as business partners, and provide access to specialized suppliers better, also succeed to find new customers in new markets. In this study, the role of cluster externalities formed from impacted by factor coopetition then analyzed the effect on the performance of the cluster formed by the dimensions of the efficiency of the location, and the company's performance in clusters.

Table 2. Regression Analysis Cluster Effect of Externalities Efficiency and Performance of the Company

Independent Variables	Dependent Variables	
	Efficiency	Financial performance
Access Capital	(0291) *	(0450) *
Marketing Cooperation	(0562) *	(0375) *
Access Technology	(0098)	(0263) *
Access Institutional	(0259) *	(0251) *
Supply chain	(0166) **	(0117) **

**) P-value <1%. **) P-value <5%*

Discussion

Table 2 show that the cluster externalities (i.e. capital access capabilities, joint marketing, and access to technology, access to institutional and collectively integrated supply chain) affect the efficiency of the cluster members. It can be seen from a regression coefficient of 0.291; 0.562; 0.098; 0.259 and 0.166 with (sig <0:01), but the supply chain by (sig <0.05). This is what shows the influence of positive and significant correlation between cluster externalities to cluster member's collective efficiency wood and rattan furniture. Cluster externalities give greatest contribution in improving the efficiency of collective cooperation and access to markets and the

effect is relatively small in the supply chain (supply chain).

Impact of all cluster externalities, i.e. access to capital, joint marketing, technology, institutional and supply chain, affected to the performance of the company indicated that the effect of 0450; 0.375; 0.263; 0.251; 0.117 with (sig <0:01), except for supply chain with (sig <0.05). This shows that the higher the positive cluster externalities will make the company's performance increases. The largest contribution to the financial performance cluster externalities is access to capital. On the contrary, it is less contribution and influence to supply chain access.

Cluster developing of the furniture industry formed by coopetition have an impaction in the cluster externalities. An established cluster is shown with a high degree of coopetition. Coopetition level in a cluster will have an impact on the externalities that ultimately affect the performance of companies in the cluster. In this study, the role of cluster externalities formed from the maturity factor coopetition then analyzed the effect on the performance of the cluster formed by the dimensions of the collective efficiency and performance of companies in the cluster.

Cluster externalities can be positive or negative can also have an impact. The impact of positive externalities in the form of clusters can ease access to capital, access to technology, access to markets, access to institutions and the establish-ment of the supply chain. Positively externalities have an impaction on improving the performance of com-panies in the cluster. The research findings cluster externalities impact on performance and efficient collective showed a significant effect, except for access to technology that does not affect the efficiency of the collective. Generally, cluster externalities positively affect the efficiency and performance of the company.

Access Capital

Capital became an important factor in supporting the operations and business development. Ease companies in accessing capital to support business success. The result study show that influence the coopetition of the furniture cluster-to-cluster externalities in the form of capital access collective impact on the efficiency and performance of the company. The higher the ability to access capital to various financial institutions in the cluster members will make operating costs more efficiency and performance of the company.

The findings of this study are consistent with research Sudiarta et al. (2014) that the dominant actors affect the performance of the Performance Management is the internal factors, which include access to markets, access to capital, entrepreneurship skills, human resources, financial knowledge and business plans. Most of companies access to credit is still limited to the informal but few are able to access formal credit. The Government must ensure access to formal finance companies, because of easier access to credit for SMEs, it can be the engine of economic development (Essien et al, 2013). The study's findings also support the empirical study of Muguchu, (2013), which indicates that there is a positive relationship between access to credit and ROA.

Small and micro enterprises (SMEs), especially in the furniture cluster has become an important player in the economy in Indonesia, but at the same time they continue to face obstacles that limit their development. Lack of access to credit is one of the main obstacles to business failure. This limited result to increase transaction costs related to financial services. On the supply side, most of the formal financial institutions assume that SME's furniture is a business unit that is less reliable relating to credit policy, thus refusing to give credit. The study recommends financial institutions to provide loan structure furniture devoted to SMEs, particularly those in a cluster. It is, because it proved to SMEs in the cluster have a good kerjsama network that can support succeed of business.

Access to marketing cooperation, the success of an organization measured by the organization's ability to enter the market. Many corporations are able to produce quality products but failed, being unable to enter the market. Failures caused by many things, including market conditions, prices, competitors. Failure to access market information that makes the company failed to enter the market, which in turn decreased performance. Cluster externalities in the form of joint marketing capabilities also have an impact on the collective efficiency and performance of the company in the furniture cluster. It has a meaning that the higher the ability of marketing cooperation among cluster members will make operating costs more efficiently and boost the company's performance.

The company's ability to access better markets may increase survival of the company trade relations also increase the company's performance. The findings of this study are consistent with research Fugazza and McLaren (2013) that the company's performance can be achieved primarily in companies that have a market network of international relations related import and export, in addition to the diversification of the production chain. Likewise with Suadiarta (2014), market access is the dominant factor affecting the performance of companies and research Munizu (2014) show that finternal actors in the form of market aspect positive effect on the performance of small and micro enterprises.

From a policy perspective, effective market access could affect the company's performance when constituted kemampauan access various permanfaat market information for the company. But if market access is only limited to the provision of the chance of promotion or trade agreements, it will not be effective. This activity can only be effective if the gains provided by preferential market access really effective. This is to say that the trade agreements of all kinds and the risks inherent with reduced preferences, aspects of trade promotion trade agreement could never leave the ability or the credibility or reputation of the industry to enter the market. Therefore, the support of the existence of an established cluster become an important factor in the succeed to supporting market access into pursuit company performance.

Access to Technology is one of the important factors that determine the success of the business. Companies that are able to master the technology and have access to technological developments will

have a competitive advantage. Research findings indicate that the cluster externalities in the form of technology access capabilities also have a positive impact on the efficiency of the collective enterprise. These findings indicate that companies that have the ability to access technological developments will be able to operate efficiently. These findings have implication that the company's presence in a cluster will make the company have the ability to access technology as the effects of cluster externalities. So that companies in clusters tend to operate more efficiently compared with companies in the inner of cluster membership.

The findings of this study support the research conducted by Samuel and Ondiek (2014) which states that the company's ability to access the technology will affect the efficiency and performance of the organization. Technology has evolved significantly and has been widely adopted in many organizations irrespective of their size. The technology that supports business operations that are used by very many small, medium and large around the world as they try to improve operations and gain a competitive advantage. Opportunities to improve the efficiency and effectiveness can be identified through examination of the various technologies within the organization, so that the company's ability to access the technology will impact the efficiency and performance of the organization. Many organizations are quick to realize that technology is the most important resource in creating a sustainable competitive advantage. This study found that many companies around the world has made remarkable strides towards the adoption of technology, however, there is still untapped potential optimally because of the large investments required in technology management. Therefore, finding a relatively new technology is very heavy like a small business that requires cooperation to share. Cooperation firms in a cluster to make access relatively cheaper technology.

Access to Institutional, Access to institutional realized with the company's relationship in which the external environment is a component of intellectual capital that provide value like Integration. The relationship is done in the form of a company's ability to build relationships with stakeholders. Relationships with various stakeholders to create knowledge that can enhance the value and performance of the company. Research results related to access to institutional on integration in wood and rattan furniture cluster. It shows that cluster externalities in the form of institutional access also have an impact on the collective efficiency and performance of the company. Thus, the higher the institutional access capabilities of cluster members to various institutions (industrial association, research institutes, government and financial institutions) would make the company's performance increases.

This finding is consistent with the opinion of Bontis (2000), which states that the relationship with institutions outside the company can add value to the company (Bontis, 2000). It is also in accordance with the finding of Cabrita and Jorge (2005) which describes the knowledge embedded in a relationship with stakeholders that can affect the life of the organization. Organizations that have an institutional bad connection will result in the company's performance.

Thus, relationships and good access to the various agencies is a good asset for the company furniture. Therefore, the company can create value for the company. Utilization of institutional relations and access to do it effectively and efficiently in order to make a profit and have a competitive advantage.

Chain management supply (SCM) has become a valuable way possible to secure a competitive advantage and improve organizational performance. This is in line with the development of business competition. If it is not connection between individual of Organization, there are not creating the supply chain. The study of furniture companies associated with cluster externalities in the form of the ability to form the supply chain management (SCM) have an impact on company performance. This finding has particularly meaning that the higher the ability of companies to form supply chain to suppliers and customers will improve the efficiency and performance of the company. This is consistent with the results of study from Suhong, et al. (2006). They stated that the level of higher SCM practice could lead to increased competitive advantage and improve organizational performance. This finding is also consistent with the results of research Sayed (2013) shows that there is a positive relationship between the supply chain management (SCM) and operational performance.

The findings of this study have implications that the supply chain has been a factor that to make improved performance of the company. Thus, changes in the environment which is characterized by high demand, technological uncertainty and higher levels of integration could impact on performance improvement, while under an environment of uncertainty is low and very little practice of integration leads to increased performance. It is concluded that the integration of the supply chain requires a more customized approach to be successful (Fynes and Voss, 2005). Implementation of the application of supply chain also need to continue to evaluate not only result-oriented. According to Sayed (2013) Evaluation of the supply chain, continue to be pursued, in order to be part of the process of reengineering the supply chain, so that the flow of goods both from the supplier and the consumer to be able to move faster and sustainable. Its need also considering the operational competence, SCM influence on performance, should be supported or mediated operational competence in accordance with the conceptual view of the resource-based and relational strategies (Miguel and Brito, 2011).

Conclusion

Research findings shows that the coopetition can effect on cluster externalities. Companies that only emphasizes the cooperation among cluster members can not create knowledge spillover in the form of either cluster externalities associated with access to technology, access to capital, access and joint marketing, institutional access and the creation of supply chain. Likewise, with companies that emphasize competition among members of cluster also has no impact on cluster externalities. Even the implementation of the cooperation strategy with only considering competition may negatively affecting the cluster externalities. Thus, corporate strategic of companies need to increase cooperation

and increased ability to compete (coopetition) which proved to be positively impact against cluster externalities.

This study also found that the impact of cluster externalities in the form of access to technology, access to capital, access and joint marketing, institutional access and the creation of supply chain affect the company's performance. However, this study also found a negative impact of access technology the technology to operational efficiency. This can be caused by the presence in the furniture industry cluster wood and rattan furniture is not much use of the high-tech but more use of the skills of the workforce. Existing of cluster externalities make, technologically precise, a negative impact on business efficiency.

This finding is expected to encourage coopetition strategies that can generate positive externalities of the existence of clusters. Finally the existence of the cluster can support improved business performance of the cluster members.

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ENTREPRENEURSHIP EDUCATION AS A STRATEGY FOR IMPROVING THE ECONOMICAL INDEPENDENCE AND COMPETITIVE ABILITY OF SOCIETY IN ASEAN ECONOMIC COMMUNITY (AEC) ERA

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Abstract

Asean Economic Community has been started, which means that the workers or products from South East Asia Countries can be freely distributed among South East Asia countries. So that every country should has variety of opportunities and threats in entering to this AEC. Indonesia still needs to improve it self in this Asean Economic Community, because there are still some obstacles i.e quality of education and labor are still low. This condition requires attention in the aspect of human resources competencies improvement by improving the quality of education. Entrepreneurship education has growth in patterns of thinking. When the competition in the market felt no longer profitable, the business instincts will lead to look for some new markets, including continuing to try their luckiness in other countries. So, the presence of AEC is a solution for businesses to continue to enhance economic independence. AEC creates demand for local business people to always build a strategy to compete in the global market. Global market presence requires human resources and products in a good quality and has the competitive advantages. Science and technology both will help to improve the quality of the nation's life. The superior nation in the world nowadays is the nations which capable for doing innovations.

Key words: Entrepreneurship education, Economic independence, and Competitiveness

Introduction

The enforcement of the Asean Economic Community (AEC) in 2016 poses a gate opening great opportunities for all parties. Along with the opportunities, there are threats that could backfire, including to Indonesia, due to problems of low quality of human resources and many improperly certified professions.

Employment profile in Indonesia shows that out of 255.4 million populations, labor forces reach 122.38 million. Of these numbers, the number of workers reaches 114.82 million while the remaining 7.56 million are unemployed. Based on the Central Bureau of Statistics (BPS) in 2015, nearly half (47.1%) of the workforce in Indonesia is primary school dropouts or graduates, consequently making the business world find it difficult to hire workers with expected qualifications.

Until now, many college graduates are still unemployed. There are several factors that cause the condition, among

others: Low Economic Growth, recent data shows Indonesia's economic growth of 4.7%, while the ideal number for economic growth is around 8-10%. In addition to that, there is still a case of discrepancies between the quality of college graduates and the qualifications required by business and industry. The quality of human resources and employment is reflected in the rating of human development index (HDI) Indonesia issued by a body of the United Nations for Development, namely the United Nations Development Program (UNDP). According to The UNDP report released in late 2015, Indonesian HDI was in the rank of 110th out of 188 countries, two ranks lower compared to 2014. Indonesia still remained in HDI `moderate 'group.

With a large number of people with uncertified professions, Indonesia is facing a threat in the employment sector. While AEC requires professionals with proven professional certification, workers from Indonesia with even extensive professional experience lose labor competition with other ASEAN countries due to the government's negligence in providing professional certification.

Professional certification constitutes a recognition to an individual's expertise in a particular field. Thus logically, anyone who has been certified will be given priority to fill a job opportunity. This also means that many Indonesian professionals, who do not hold professional certification, face many obstacles in competing globally and many are subsequently not absorbed in job fields.

Entrepreneurship Education

According to the United Nations Development Programme (UNDP), Indonesia's Human Development Index (HDI) is still low, while the competition in the ASEAN Economic Community requires superior quality of human resources. This suggests that efforts to improve the quality of human resources should be increased in order for the Indonesian human resources to be able to compete globally. Improving the quality of productive human resources requires competent education.

Formal education aiming at improving competitive human resources requires *links and match* with the industrial world. In addition, formal education also needs to nurture self-reliance among students by providing entrepreneurial knowledge.ntrepreneurship education can be conducted either formally or non-formally, among others by adopting Entrepreneurship curriculum at all levels of education and conducting entrepreneurship training. Through entrepreneurship, work forces are able to produce the product demanded by the markets and these create self-reliance. Training centers need to have sustainable guidance and assistance so that prospective entrepreneurs can grow and be competitive. Entrepreneurship education will create creative and innovative society. Hence entrepreneurship education is the key to competing in the AEC.

Entrepreneurship applies the values of courage in taking opportunities and building self-reliance. Mercubuana University had been applying entrepren-eurial matters in three semesters of curriculum, as well as establishing cooperation with "Dare to be a billionaire" community, which contains public lectures or seminars to motivate students so that the desire for entrepreneurship can grow up. In addition, there will be some continuous workshops, guidance about how to start and run their business, and also how to get initial fund of government's program, as well as private and banking sector program. These activities would make it be some source of inspiration, learning, and a new perspective for the students, which they

could finally figure out the fact that building a business is the right choice to be done. Up until now, there had been many groups of Mercubuana University student who won a grant from the entrepreneurial government's program.

Entrepreneurship education can be carried out through informal channels followed by various participants. This program can be done through entrepreneurial training, workshops, and the like, which can be followed either by those who do not complete formal schooling, those who are still in school, or those who have graduated and even retirees.

Entrepreneurship should be spread evenly from the bottom level to the top, and not only in cities but also in villages. There are three commodities as a source of ideas to be developed into new innovations that are always in demand and can always be developed in entrepreneurial activities, namely food, energy and water. according to national seminar of Imaroh in 2015
In the course of entrepreneurial activities of students, for easier and dare to build business and increase self-reliance, then: (1) Some of the lecturers in lectures entrepreneurship are businesses, to facilitate the giving of information significantly. 2) Students are equipped with business theories practical 3) In the course, students are faced with a business opportunity and are encouraged to formulate a business idea 4) Students implement its business with the tools methods of the canvas, with a variety of considerations 5) To steadiness presented guest lecturers as a business complex, in this case presented many alumni who have succeeded have global businesses 6) Students perform / implement a business concept that has been made in the method of the canvas 7) End of meeting face to face lectures do business fairs do around campus. 8) As a follow-up and business continuity, technical support and guidance from their educational institution / campus or on campus partners.

Entrepreneurial skills make all parties possible to take advantage of the existing opportunities and compete at the ASEAN level. Indonesia needs to increase the number of entrepreneurs in order to become a developed country and compete in the AEC. It can be achieved by changing the old mindset of young people – becoming successful employees – into the new mindset – becoming an entrepreneur. The younger generation should have a good entrepreneurial spirit such as risk-taking, creative, and innovative.

The research results show that entrepreneurship education significantly has positive effect on entrepreneurial attitude. This means that the better the entrepreneurial learning is obtained, the better the attitude of entrepreneurship is owned (Ma'ruf, 2013). The concept offered (Abdurrahman D, 2015) is an entrepreneurial education which is based on local wisdom, creativity, innovation, and technology which play a role in creating entrepreneurship in the form of cooperatives, industry, and Micro, Small and Medium Enterprises (SMEs). The progress of entrepreneurship in Indonesia now stands at 1.65 per cent of the total population of Indonesia. If it reaches two percent, Indonesia can be prosperous, eventhough it is not evenly spread. This condition is lagging far by AEC members such as Singapore and Malaysia.

Singapore has managed to achieve a percentage of 7% of entrepreneurs out of the total population of the country. Indonesia continues to increase the number of enterpreneurs by conducting entrepreneurship education activities and motivational campaigns which will increase entrepreneur potentials to compete in this AEC. AEC is like double blades of a knife for Indonesia. It could be an opportunity to bring benefits and blessings (*land of opportunities*), but it could also be a disaster (*loss of opportunities*). In the case

when Indonesia becomes a producer that exports a lot (business doer), benefits from the AEC can be yielded. On the contrary, failing or being unable to take advantage, Indonesia could be an easy victims for importers and end up being only product users. We could only experience *loss of opportunities*.

To directly plunge into the entrepreneurial world without entrepreneurship education is possible. However, the risk for failures is high and it needs relatively a long time to be successful. In this AEC, Indonesia can still compete by intensifying entrepreneurship. Entrepreneurship education would help people overcome the existing problems more quickly and is expected to achieve success without repeating the same mistakes. The implementation of entrepreneurship education will create a creative, independent, and competitive society. AEC, which is previously seen as a threat, with the provision of entrepreneurial education, will turn into a more promising opportunity.

The government has conducted an acceleration program in growing entrepreneurship in collaboration with educational institutions and religious institutions. The government calls on the business world, both private and state-owned enterprises to be the driving agent in implementing the program of industrial development, the Government of Indonesia through the Ministry of Industry also emphasizes the development of small and medium enterprises (SMEs) by facilitating access to capital for SMEs through business credit, Community Development Partnership Program, Venture Capital and Corporate Service of Responsibility (CSR). It can be recognized that entrepreneurship is a potential for development, both in the quantity and quality of entrepreneurship itself. In developed countries, enterpreneurs are the biggest devisa generators as well as the main drive for the economy of a country.

Professional Certification

An important element of AEC is the free flow of skilled or professional labors. Skilled workers and professionals need to be highly appreciated, certification is there to indicate professional and skilled human resource. Therefore, certification is most needed to win job opportunities. Certification of professional competence could become ammunition for Indonesian workers to welcome the ASEAN Economic Community (AEC) as professional competence is workers' provision to compete globally. Certification owned by workers will be recognized by organizations or clients, as well as by cross-sectoral or cross-nations.

Indonesia has enough competitive and professionals labors. In addition to formal education, many Indonesian workers are also equipped with specific skills through trainings conducted at the Vocational Training Centres (BLK). The acceleration of Indonesian National Work Competency Standards (SKKNI) which is undertaken by the government also poses a contributing factor in the success of labor competition in the AEC era. Indonesian workers are also encouraged to obtain professional certification, gaining recognition in their sectors through the Mutual Recognition Agremeent (MRA). According to M. Dhakiri (menaker). Competence development is done continuously by the university management Mercu Buana in menunbuhkembangkan entrepreneurial spirit of students to the achievement of 2.5.

Certification constitutes an effort to increase the competitiveness of the local workforce competence to the competence standard of foreign labors that subsequently will have a full access to enter and work in the single market. Minimum competency standards must be equal to the competency of foreign workers. It will be

very disadvantegous if the professional competence standards of Indonesia's human resources are far below the competence standards of other Asean countries.

National Professional Certification Board (BNSP) encourages the professional certification to improve the competitiveness of Indonesian human resources in the AEC. As each country is currently competing to prepare its society to be competent human resources. In this AEC's tight competition, Indonesia is still lagging in the aspect of technological capabilities, lower interest-rate capital flows, and employment. Certification is very important. Relying on mere practically obtained competence is not enough to face the era of free trade. Labors also should officially prove their skills by having professional certifications.

National Professional Certification Board (BNSP) encourages the establishment of professional certification agency (LSP) as an extension of BNSP which is tasked to carry out the competence certification process for workers in accordance with their respective field. Since BNSP certification program was first launched in 2005 until the end of 2014, the number of workers certified is only about 2.1 million, whereas the target is 5 million people. Of the 2.1 million workers (already certified), nearly 70 percent are migrant workers, because it includes terms that are 'mandatory' and is set in the legislation. BNSP 2019 certification targets the professional workforce as many as 10 million people and 600 LSP. In 2015 BNSP targeted certification of 1.3 million workers with details of 120 thousand ASEAN-level certified workers om AEC's 12 priority sectors.

The facilitation of professional certification program conducted by Bekraf will also be carried out in the area, from the provincial levels to regency and municipality levels. Bekraf opens cooperation with various Professional Certification Agencies (LSP) that have been recognized by the National Professional Certification Board (BNSP) in the sub sectors of creative economy, to conduct training through professional certification, the more certifications carried out, the higher competitive ability of the community is. It also demonstrates the competence and self professionalism.

Economic Independence and Competitiveness

Human Resource Competence will improve the ability and creativity and develop innovation in building businesses. Governments, entrepreneurs, and the general public are needed to support entrepreneurial actions as an effort to strengthen the nation's independence. Entrepreneurship education is expected to give birth to generations of entrepreneurs who are productive and efficient so as to have high competitiveness in the global market, especially the AEC. Productive entrepreneurs continue to open up the target market and increase exports; it is as one of the parameters of national self-reliance.

Self-reliance reflects the attitude of a person or a nation about himself, his community, and his spirit in the face of challenges. In broad terms, the attitude of self-reliance is essentially a cultural issue. The attitude of independence is reflected in every aspect of life, in legal, economic, political, social, cultural, defense and security. Self-reliance can mean an effort to minimize dependence on the outside world, especially for resources and strategic sectors or as an attempt to optimally utilize the entire potential of the local in accordance with local knowledge but still open space for partnership with foreign parties for the benefit of the member and national interest. Therefore, independence

is also the nation's capital to compete globally.

Competitiveness is influenced by the ability to produce products with high quality and low prices so as to compete with foreign products. Productivity is a main factor in producing a quality product, and efficiency is the determining factor to compete on price. Thus, entrepreneurship education greatly contributes to improving the competitiveness of human resources.

The increase of Indonesia's competitiveness is reflected in the report of the World Economic Forum or the World Economic Forum (WEF), which released the Global Competitiveness Index of 2014-2015. In the release it was stated that the competitiveness of Indonesia rose by 4 notches to rank 34th out of 144 countries in the world. Indonesia's rank outperformed Spain (35), Portugal (36), the Philippines (52), Russia (53), Brazil (57), India (71), Greece (81), Egypt (119) and Pakistan (129). In 2012, Indonesia's competitiveness is on rank 50, in 2013 it was on 38th and the years 2014-2015 ranked 34th. McKinsey Global Institute suggests that Indonesia was ranked the 16th economic power in the world and most likely would continue to be rated as the world seventh strongest economy in 2030.

Indonesia has a youth population that is growing rapidly in urban areas. This factor gives the power to increase the country's revenue. WEF competitiveness is grouped in 12 pillars: institutions, infrastructure, macro economy, health and primary education, higher education, goods market efficiency, labor market efficiency, financial market, technological readiness, market size, business sophistication, and innovation. Next, the 12 pillars are grouped into three major groups of pillars, namely: basic requirements, Efficiency Enhancers, and Innovation and Sophistication Factors. Qualified human resources is a key factor to increase overall competitiveness.

The main source of competitiveness increase is productivity and the average productivity increase. Porter pointed out that the industrial sector is a key driver to national competitiveness. Through the industrial sector, human resources, capital and natural resources are managed and taken benefit to produce the goods / services at the level of efficient cost and excellent quality as well as selling them to domestic and global markets competitively.

There are strengths and weaknesses of the business environment in Indonesia. First, Indonesia's strength lies in the availability of a large number of labor force with strong levels of basic skills. Second, the implementation of legal reform program / legislation and regulations that creates a business climate conducive to the business world. Third, the creation of a solid financial system that guarantees the availability of sufficient foreign exchange reserves to stabilize the rupiah against foreign currencies, in particular currencies of powerful countries. Fourth, Indonesia is willing to open to foreign investment. Fifth, there is enough room that is abundantly owned by Indonesia for the development of clusters, particularly in the natural-resource-based industrial sectors. This last point could provide a comparative advantage for Indonesia.

Indonesia continues to improve the business environment to become more conducive for investors both domestic and foreign investors so that real business takes place. In the competition of industries/ products, three general requirements must be met in order to be able to be the winner of competition, namely:

1. Producing a good or service while maintaining quality at the

most efficient level of costs so selling price is competitive.

2. Differentiation in the sense that the resulting products have their own uniqueness and they are able to aptly communicate the quality and price of the products to build and create superior perceived value in the minds of consumers.

3. Cluster development system that focuses on specific products or fields based on locally owned abundance of resources, a condition of which has competitive and comparative advan-tages so as to produce different products and "superior perceived value" with the mastery of technology.

Conclusion

Education is one of the most important aspects that we need to prepare competitive human resources in order to achieve success in this single market. Promoting education is done not only by changing the curriculum, complementary facilities and infrastructure, but also by paying attention to the development of human resources that are tasked to carry out the education. Therefore, to achieve better in the future education, the top priority is to improve human resources through quality education in order to raise awareness of all elements of society, the government and the parties concerned in improving themselves to build creativity in the era of AEC , entrepreneur holds a very important role in improving the economy of a country. Economic progress is in line with the capabilities of a country in increasing the level of well-being and equal prosperity of the nation. The large number of entrepreneurs in a country will accordingly indicate the fulfilment of two important phenomena within a developed and economically prosperous country: low unemployment rate and high devisa income, which come mainly from the export of goods produced.

Entrepreneurship poses a keyword which reflects a country's self-reliance, which mean being capable of responding to all kinds of shocks and improving competitiveness. When domestic entre-preneur is not growing, foreign entrepren-eurs will fill the big market, which could mean domestic people's being mere spectators and users.

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