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RICE Journal of Creative Entrepreneurship and Management (RJCM)
Rattanakosin International College of Creative Entrepreneurship (RICE)
Rajamangala University of Technology Rattanakosin (RMUTR)

About Us

RJCM is an international journal for academics and scholars at the higher education level to communicate and share their viewpoints and academic work with fellow professionals in the areas of creative entrepreneurship and management as practiced in their fields of specializations in social sciences.

RJCM publishes three numbers per volume annually and welcomes contributors to submit their manuscript in January, May, and September of each year. We accept both academic and research papers in social sciences from contributors.

The length of the unformatted manuscript in WORD can be 15-25 pages in length including references. The contents of the manuscript should include (1) a title with the author's name, affiliate, email address and telephone contact, (2) an abstract of 150 words with 3-5 keywords, (3) an introduction, (4) a rationale and background of the study, (5) research objectives, (6) research methodology, (7) data collection procedure, (8) data analysis, (9) results and discussion, (10) research limitation (if any), (11) conclusion, (12) the author's biography of about 50-80 words, (13) acknowledgement(s) (if any), (14) references, and (15) an appendix or appendices (if any).

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Note from Editors of *RJCM* Volume 1 Number 3

Dear *RJCM* Readers,

You are now with our third issue in Year 1 of *RICE Journal of Creative Entrepreneurship and Management* (*RJCM*). This issue contains six articles in the areas of tourism and service industry, culinary arts, change management, and project document assessment.

In this issue, we have two papers in the area of the tourism and service industry to shed light on its current situations: *"Impacts of Service Quality on Tourists' Selection of Lodging in 4-5 Star Hotels in Thailand"* (Article 1) and *"Teamwork in Service Industry Organizations*" (Article 6). Two papers in Culinary Arts are *"Potential of Chinese Herb "Cordycep militaris" as a Medicinal Food"* (Article 2) and *"What Makes a Good College Level Culinary Curriculum in the 21st Century"* (Article 4)—both dealing with new challenges in the field. Two more papers report major considerations in change management, and project assessment: *"Innovation and Change Management"* (Article 3) and *"Collaborative Filtering for Project Document Assessment of Missing Score Estimation"* (Article 5). These articles provide a new perspective on the issues of concern regarding innovation, management and entrepreneurship in the fields under study.

Our paper contributors are researchers/ scholars from different universities and business organizations: Chiang Mai University, Rajamangala University of Technology Rattanakosin, Thai Orchids Lab Co., LTD., Papilotte Western Restaurant, and one independent scholar in Management and Public Administration—all in Thailand.

The editors-in-chief hope that the findings reported and the major points discussed in these papers will be interesting to both researchers and practitioners who may share the same interest. The *RJCM* editorial team and the authors would appreciate hearing comments from our readers about the published work. We always welcome contributions from those who may wish to be part of our *RJCM* network.

Nuttapong Jotikasthira, Ph.D., Editor-in-Chief 1
Ruja Pholsward, Ph.D., Editor-in-Chief 2
Jamie Wallin, Ph.D., Editor-in-Chief 3

Catthaleeya Rerkpichai, D.I.Ed., Assistant Editor

Address from RICE Director

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Dear *RJCM* Readers,

To materialize the vision of being *the university for entrepreneurial society* in promotion of the creative industry both in and outside Thailand, Rajamangala University of Technology Rattanakosin (RMUTR) has founded Rattanakosin International College of Creative Entrepreneurship (RICE) since 2018. RICE has its mission to develop and operate international programs that nurture entrepreneurial spirit and skills in students to foster the country's socio-economic advancement with their creativity in the specialized disciplines as well as competency in handling complex problem-solving tasks. This comes with the new challenges in the new world arena characterized by uncertainties as new normals, and rather unexpected patterns of interconnections across its boundaries.

RICE Journal of Creative Entrepreneurship and Management (RJCM) is developed as an international journal to disseminate research and academic papers in the fields of creative management and its related disciplines in diverse types of organizations and contexts. It is expected that both academics and practitioners can benefit from the published articles reporting findings of selected studies, current academic trends, and professional viewpoints. The journal is a scholarly peer-reviewed and fully referred to get a good impact in the international publication network.

In my view, this journal has an official role of RMUTR in supporting the University's goal on creating quality research work, as well as disseminating useful research findings and particularly, innovations in management science for applications both at the domestic and international levels. On these credentials, I hope that this journal will serve the identified purposes well and the editorial team will definitely try their professional best to work with paper contributors, reviewers and readers of publications.

With my best wishes for readers and paper contributors of *RJCM*.

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Impacts of Service Quality on Tourists' Selection of Lodging in 4-5 Star Hotels in Thailand

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Abstract

Tourism has been classified by World Trade Organization (WTO) as one leading revenue in a country's service sector and widely recognized as one of the key factors in international business. As seen in Thailand as a key engine of economic growth, international tourists were recorded at 39.8 million with their total spending at 2.21 trillion baht (US$70 billion) in 2019. The lodging is certainly an essential resource in the tourism sector and the service quality is of prime importance in determining customers' decision on the selected hotel. The researcher therefore investigated impacts of service quality on tourists' selection of lodging of 4-5 star hotels in Thailand. This research was to find out about customers' different attitudes toward service quality they experienced inside 4-5 star hotels in Thailand, and whether the customers' expectation exceeds the levels of the perceived service. The researcher used a survey questionnaire to collect quantitative data, followed by qualitative data provided by 478 respondents in the study. The results pointed to the significance of the gap between customer expectation and perceived service in five dimensions of service quality: (1) reliability, (2) assurance, (3) tangible, (4) empathy, and (5) responsiveness. It was expected that the obtained findings would shed light on the gap in the service quality determinants to identify restraints to remedy and strengthen the identified dimensions of service quality for consumers' greater satisfaction.

Keywords: *Service quality, service expectation, service perception, tourist lodgings, 4-5 star hotels, tourism in Thailand*

1.Introduction

The statistics in 2018 from the Ministry of Tourism and Sports of Thailand reported 38.3 million international arrivals in Thailand as the second tourism destination in the Asia-Pacific region after China (www.wto.org, 2018). The revenue was approximately 60.67 billion US dollars, and this resulted in several million direct and indirect employments. Such statistics has positioned tourism as a significant sector for Thailand's economic growth. In the tourism sector, lodging or accommodation is one of the most important factors for travelers to lodge for comfort with quality ssevice. The Tourism Authority of Thailand (Tourism Statistics Thailand, 2019) recorded 18,863 tourism accommodations throughout Thailand in 2019, of which 70 percent categorized as hotels and resorts, and noted that the number of hotels has increased every year, especially in the tourism zone (Tourism Accommodation, 2019).

Table 1: The Statistics 2019 of Tourists' Accommodation in Thailand

Regions	Number of Accommodations	Number of Rooms
Bangkok	641	90,275
Center (except Bangkok)	789	38,944
West	2,080	55,001
East	2,521	126,806
North	3,761	107,110
North-East	2,871	84,015
South	6,200	241,572
Total	18,863	743,723

Source: https://intelligencecenter.tat.or.th/articles/11846

The focus of this research was on service quality and customer selection. Lewis & Booms, 1983) defined service quality (SQ) as an evaluation of perceived expectations (E) of a service with perceived performance (P), giving rise to the equation SQ=P-E. Five dimensions of the service quality encompass *reliability, assurance, tangibles, empathy, and responsiveness*—all known as vital factors in service quality or SERVQUA (Parasuraman, Berry & Zeithaml, 1991). The service quality is one of the mechanisms to drive the hotel to realize its position by strengths and weaknesses, and to improve its service quality in required dimensions accordingly. Customer selection of or decision on service is determined by factors, such as recommendations, personal needs, and past experiences or terms that constitute customer's expectations of the service perceived at the level probably different from that actually promised. The gap in service quality as perceived by customers is vitally important in that the hotel needs to recognize customers' consummation and satisfaction in order to do well in the tourism and hospitality industry.

This research was meant to examine customers' selection of 4-5 star hotels in Thailand as determined by service dimemsions of the service quality. The results of the study were expected to identify advantages and disadvantages of the service quality rendered. The five dimensions of the service quality–reliability, assurance, tangibles, empathy, and responsiveness—are for hotels to create the service quality to satisfy their customers. The subjects of this research were 478 customers of 4-5 star hotels in Thailand. The survey questionnaire for data collection was constructed after literature review of major research works.

2. Literature Review and Related Research

This section covers literature review in various aspects: service quality, service expectation, perceived service, dimensions of service quality: SERVQUAL Model, tourists lodging, hotel rating, tourism and hospitality in Thailand, followed by related research in the areas of tourism and hospitality, service quality and customers' selection of accommodation.

2.1. Literature review

2.1.1 Service Quality

As for the definition of *service*, Kotler (1997) put it as *an action or an activity which can be offered by a party to another party, which is intangible and cannot affect any ownership.* Service may be related to a tangible product or intangible product. On the other hand, Zeithaml (1984) mentioned that *service quality is a focused evaluation that reflects the customer's perception of specific dimensions of service*, namely reliability, responsiveness, assurance, empathy, tangibles. Lewis & Booms (1983) defined service quality (SQ) as *a comparison of perceived expectations (E) of a service with perceived performance (P), giving rise to the equation SQ=P-E.* Service Quality is therefore an assessment of how well a delivered service conforms to the client's expectations. Service business operators often assess the service quality provided for customers to improve their service, to quickly identify problems, and to better assess client satisfaction (Mmutle, 2017; www.businessdictionary, 2019).

Service quality can be referred to as *attainment in customer service.* Customers form service expectations from past experiences, word of mouth, and marketing communications (Parasuraman, 1991). Normally, customers compare perceived service with expected service, and if the perceived service exceeds expected service, the customers are disappointed. Service quality counts as the most important influence for customers' buying decisions and contributes to market share and returns on investment.

2.1.2 Service Expectation

Customer expectations refer to the perceived value or benefits that customers seek when purchasing a good or service. It is the result of the 'learning' process and can be formed very quickly because the first impression matters a lot. Customers' expectations influence over decision-making processes and are unlikely to change. For example, branded items are often related to quality. Most customers expect that well-known brands are of high quality and thus tend to evaluate the product's performance higher than that of an identical product of a less-known brand. This is one of the reasons new brands find it difficult to catch customers' attention in presence of superior products. Most successful companies therefore turn to service of that particular new product or brand for added value. Managing and fulfilling customer expectations are of vital importance to the success of any brand/company. Customers often want more, better, and faster of a product or service. Expectations of high-performing products are always rising (www.mbaskool.com, 2019). Archerybusiness (www.archerybusiness.com, 2019) defined expectations as *a combination of beliefs and assumptions about what is likely to happen in the future*. Perceptions are very subjective and based on personal interpretations of information collected during one's experience. Perceptions vary by spending experience, current mood and emotions. Between each customer's *expectations* and *perceptions* is a gap. The larger the gap, the more likely for a product/ service provider to create unsatisfied customers. If customers have low expectations, it is not difficult to satisfy them. If their expectations are high and a product/ service provider is not able to handle the latter's expected perceptions, they are likely to go elsewhere.

2.1.3 Perceived Service

Perceived quality can be defined as the customer's perception of the overall quality or superiority of a product or service with respect to its intended purpose, relative to alternatives. Perceived quality is a perception of customers and cannot necessarily be objectively determined because of subjectivity embedded in perception. Perceived quality is an intangible, overall feeling about a brand. However, it usually will be based on underlying dimensions regarding reliability and performance (www.studymarketing.org, 2019). Aaker (1991) identified *five dimensions of perceived quality of the service concept: (1)tangibles, (2) reliability, (3) competence, (4) responsiveness, and (5) empathy.*

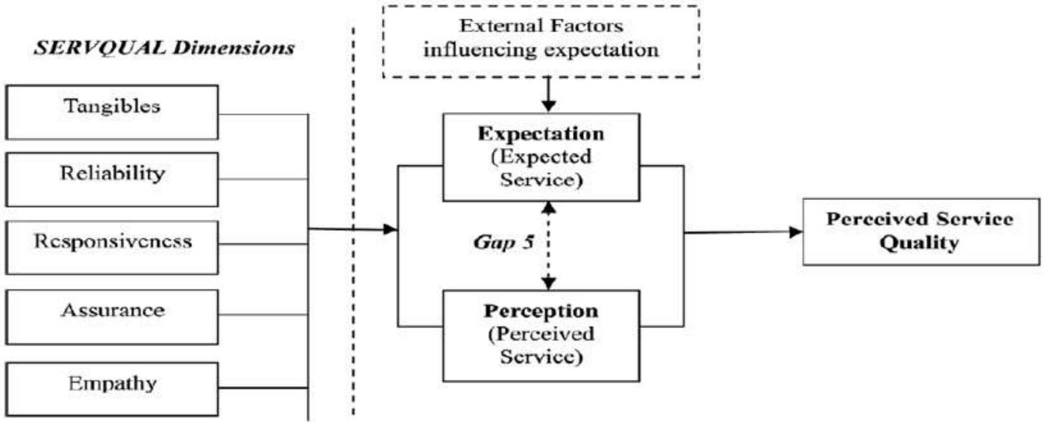
2.1.4 Dimensions of Service Quality: SERVQUAL Model

According to Parasuraman, Berry & Zeithaml (1991) and Parasuraman (1985, 1991), the quality of services is assessed for customers' satisfaction. Service satisfaction can be seen from comparison between customers' perceptions of service received and expectations of service desired. In other words, service quality is considered unacceptable when expectations are not met. Quality is satisfaction with perceived service and confirmed expectations. Besides, Parasuraman, Berry & Zeithaml (1991) introduced five dimensions which led to the development of SERVQUAL as follows:

1. Tangibles: The appearance of employees, physical facilities being offered, and equipment which forms part of the service experience.

2. Reliability: The way the service is being delivered, that is, the ability to deliver the promised service precisely and consistently.
3. Responsiveness: Willingness to help customers, respond to their queries, and also to provide rapid service to them.
4. Assurance**:** Understanding and courtesy of the staff and their capability to inspire trust and confidence.
5. Empathy: Helpful, care about the customers' requirements and the firm provides individualized attention to its customers with sympathy.

Figure 1: The Five Dimensions of Service Quality (Parasuraman, Berry & Zeithaml1991)



SERVQUAL is a multi-dimensional research instrument, designed to capture consumer expectations and perceptions of a service along the five dimensions that form service quality (Parasuraman, 1985, 1991). SERVQUAL is built on the *expectancy-disconfirmation paradigm*; service quality is understood as the extent to which consumers' *pre-consumption expectations* of quality are confirmed or disconfirmed by their *actual perceptions of the service experience*. Businesses use the SERVQUAL instrument (questionnaire) to measure potential service quality problems and the model of service quality to help analyze possible causes of the identified problems. The model of service quality is formed on the *expectancy-confirmation paradigm* which suggests that consumers perceive quality in terms of their perceptions of how well a given service delivery meets their expectations (Oliver, 1994). Service quality can be conceptualized as a simple equation: SQ = P-E where SQ is service quality, P is the individual's perceptions of given service delivery, E is the individual's expectations of given service delivery, (Lewis & Booms, 1983). When customer expectations are higher than their perceptions of received delivery, service quality is considered low; when perceptions exceed expectations, then service quality is high.

2.1.5. Tourists Lodging

There are more than 25 subsectors in the tourism industry, especially three sectors--food services, air travel, and accommodations--accounting for over 45 percent of the total output. The largest of the three--the accommodations subsector--accounts for over 19 percent of total travel and tourism-related spending. In 2016 travelers spent more than US$293 billion on traveler accommodations and they supported more than 1.4 million U.S. jobs. The Air Travel subsector is the second largest and accounts for nearly 15 percent of total travel and tourism-related spending. In 2016 travelers spent nearly $227 billion on passenger air transportation services; this supported 895,000 U.S. jobs. The third largest subsector--the Food Services--accounts for more than 11 percent of travel and tourism-related spending at nearly $174 billion in 2016, and the revenue supported nearly 1.9 million U.S. jobs (http://oer.nios.ac.in/wiki).

Accommodation is one of the basic needs of tourism activities. Travelers and tourists need lodging for relaxation, while they are on a journey. All the major tourist destinations tend to provide for tourists low budget lodges/hotels to world-class luxury hotels. Travel agents and tour operators usually include accommodation in the itinerary (Tourist Accommodation, 2019). Lodging or a holiday accommodation is defined as a type of residential accommodation (www.businessdictionary, 2019). People who travel and stay away from home for more than a day need lodging for sleep, rest, food, safety, shelter from cold weather or rain, storage of luggage, and access to common household functions. Lodgings may be self-catering, in which case no food is provided, but cooking facilities are available, such as Bulverton House in Sidmouth (UK), a self-catering establishment, proposing a range of flexible accommodation, with high energy efficiency, high specification fittings, and features and designated parking permanently lit overnight.

Poudel (2013) clarified that accommodation is a fundamental element of the tourism product. Tourism, in a broad sense, is dependent on the quality and quantity of accommodation facilities available. It is a very vital factor in tourism development. The development of accommodation should be considered a core factor of the tourism planning aimed at successful tourism development. In other words, accommodation is a *matrix of tourism*, and consequently, the appropriate choice of accommodation is required to expand and develop the tourism industry.

Tourist accommodation establishment indicates a local kind-of-activity unit providing as a paid service (although the price might be partly or fully subsidized) short-term or short-stay accommodation services. Tourism accommodation establishments are classified and described in groups: hotels and similar accommodation, holidays and other short-stay accommodation, and camping grounds, recreational vehicle parks, and trailer parks.

2.1.6. Hotel Rating

Hotel rating is referred to as the concept that categorizes hotels in terms of 'grading', 'rating', and 'classification' in quality. The initial purpose is to inform travelers on basic facilities that can be expected, and later expanded into a focus on the hotel's experiences (Hensens, 2015). Food services, entertainment, view, room variations, such as size and additional amenities, spas and fitness centers, ease of access, and location may be considered in establishing a standard. Hotels are independently assessed in traditional systems and rest heavily on the facilities provided. Some consider these as disadvantages to smaller hotels whose quality of accommodation could fall into one class but the lack of an item, such as an elevator would prevent it from reaching a higher level of categorization (https://www.semanticscholar.org, 2013).

Hotel classification systems are used in the accommodation sector as providing an indicator to both consumers and intermediaries on the standards to be found at individual establishments. It is vital in the accommodation sector where the product (accommodation) is bought/listed sight-unseen (consumers/intermediaries are not able to see or test the product offering before the purchase/listing is made). Besides, hotel classifications can afford advantageous marketing platforms for individual hotels and for destinations desiring to promote the quality of their offer. However, establishing a classification system for tourism accommodation is a complex undertaking due to the variety of both accommodation types and of the cultural, environmental, and economic contexts in which the systems are embedded (Keshavarz, 2015; https://www.hotelstars.eu, 2019).

Table 2: Criteria for Hotel Stars

Hotel Star	Excerpt from the Catalog of Criteria
☆ Tourist	- Shower/WC or bathtub/WC for 100% in room - Cleaning daily in room - Color-TV together with remote control for 100% in room - Table and chair - Body wash or soap - Reception service - Facsimile at the reception - Publicly available telephone for guests - Extended breakfast

Hotel Star	Excerpt from the Catalog of Criteria
	- Beverage offer in the hotel - Deposit option
☆S Superior Tourist	The Superior flag is provided when the additional service and accommodation provisions are not sufficient for the next Hotelstar. The bathroom facilities are usually at the same level as for two-star hotels but built from cheaper materials. The cost for regular inspection by independent associations is waived as well.
☆☆ *Standard*	In addition to the single star (*) hotels: - Breakfast buffet - Reading light next to the bed - Bath essence or shower gel - Bath towels - Linen shelves - Offer of sanitary products (e.g., toothbrush, toothpaste, shaving kit) - Credit cards
☆☆S *Superior* *Standard*	The Superior flag is provided when the additional service and accommodation provisions are not sufficient for the next Hotelstar. The Standard-Superior does usually offer the same service level as three-star hotels but the interiors of the hotel are smaller and cheaper so that the three stars were not to be awarded by the inspection body. A two-star superior does not require mystery guesting.
☆☆☆ Comfort	In addition to the standard star (**) hotels: - Reception opened 14 hours, accessible by phone 24 hours from inside and outside, bilingual staff (e.g. German/English) - Three-piece suite at the reception, luggage service - Beverage offer in the room - Telephone in the room - Internet access in the room or the public area - Heating facility, hair-dryer, cleansing tissue in the bathroom - Place to put the luggage/suitcase, dressing mirror - Sewing kit, shoe polish utensils, laundry, and ironing service - Additional blanket and pillow on demand - Systematic complaint management system
☆☆☆S Superior Comfort	The Superior flag is provided when the additional service and accommodation provisions are not sufficient for the next Hotelstar. The accommodation facilities for a superior hotel need to be on a modern level and fully renovated which is checked regularly.
☆☆☆☆ First Class	In addition to the comfort star (***) hotels: - Accessible by phone 24 hrs from inside and outside, reception opened 18 hrs

Hotel Star	Excerpt from the Catalog of Criteria
	- Lobby with seats and beverage service - Breakfast buffet or breakfast menu card via room service - Minibar or 24 hours of beverages via room service - Upholstered chair/couch with side table - Slippers and bathrobe on demand - Cosmetic products (e.g. shower cap, nail file, cotton swabs), vanity mirror, the tray of a large scale in the bathroom - Internet terminal and internet access - "À la carte" –restaurant
☆☆☆☆S First Class Superior	The Superior flag is provided when the first-class hotel has a proven high quality not only in the rooms. The superior hotels provide additional facilities in the hotel like a sauna or a workout room. The quality is checked regularly by mystery guesting of external inspection service.
☆☆☆☆☆ Luxury	In addition to the first-class (****) hotels: - Multilingual staff, reception opened 24 hours - Doorman-service or valet parking - Concierge, page boy - Spacious reception hall with several seats and beverage service - Personalized welcome for each guest with fresh flowers or a present in the room - Minibar and food and beverage offer via room service for 24 hours - Personal care products in flacons - Offer Internet-PC in room - Room is safe - Shoe polish service, ironing service (return within 1 hour) - Turndown service in the evening - Mystery guesting
☆☆☆☆☆S Superior Luxury	Luxury star hotels need to achieve high expectations of international guest service. The Superior Luxury star is only awarded a system of intensive guest care.

https://www.hotelstars.eu/criteria/Source

The Hotelstars Union enhances the reputation and quality of the hotel industry in the participating countries by creating transparency and security for the guests and thereby encouraging hotel marketing.

2.1.7. Tourism and Hospitality in Thailand

In Thailand, the number of tourist arrivals has still been on the rise even it passed several unpleasant happennings from floods, bombings, coups, political upheavals to a few unsolved, mystery murders. In 2016 Thailand registered 32.6 million visits. The number of tourists visiting Thailand increased from 35.35 million in 2017 to 38.28 million in 2018 (Tourism Statistics Thailand, 2019). Tourism plays an important role in the Thai economy as stated by the National Economic and Social Development Council (NESDB) that tourism accounted for 18.4% (or close to one-fifth) of the GDP of Thailand. It has risen from a level of 14.2% of GDP just four years earlier. A recent development is the increasing number of Chinese mainland visitors that surpassed 10.5 million visitors in 2018, making up 27.5% of the total (www.thaiwebsites.com).

Table 3: The Statistics of Tourism Arrivals from 2010 to 2019

Year	Number of International Arrivals (million)
2010	15.9
2011	19.2
2012	22.4
2013	26.5
2014	24.8
2015	29.9
2016	32.6
2017	35.4
2018	38.4
2019	39.8

Source: Ministry of Tourism and Sport, 2019 (www.thaiwebsites.com).

World Travel and Tourism Council (www.wttc.org) reported the case of Thailand that the direct contribution of Travel & Tourism to GDP was 36.7 billion USD; the tourism sector represented 9.2% of total GDP in 2016. It directly supported 2,313,500 jobs (6.1% of total employment) in 2016 and rose to 6.3% in 2017 and then 5.0% to 4,009,000 jobs (10.4% of total employment) in 2027. The total contribution of Travel & Tourism to employment, including jobs indirectly supported by the industry was 15.1% of total employment (5,739,000 jobs) in 2016. In 2017, it grew up 6.9% to 6,137,500 jobs and 4.6% to 9,599,000 jobs in 2027 (24.9% of total). Visitor exports generated 53.7 billion USD, 19.2% of total exports in 2016. In 2017, it rose by 10.3%, and grew by 7.3% from 2017 to 2027, and generated 4, 210.2 billion baths (119.5 billion USD) in 2027, 29.7% of the total. This sector investment in 2016 was 7.1% of the total investment of 7.0 billion USD. It raised by 10.3% in 2017, and 5.5% over the next ten years to 13.1 billion USD in 2027, 10.0% of the total investment.

Table 4: The Statistics of Hotel and Resort 4-5 Stars in Thailand in 2016

Hotel 4 Stars	Hotel 5 Stars	Resort 4 Stars	Resort 5 Stars
39	26	52	39

Source:http://thaihotels.org/wp-content/uploads/2016/01/NAME-LIST-FOR-THAILAND-HOTEL-STANDARD-FOUNDATION.pdf

Thai tourism has been flourishing with Chinese tourists as the key driver augmenting the hotel industry's occupancy rate and receipts. Investments in the hotel industry are expected to continue in (1) major tourist areas following the investment plans of Thai and foreign hotel chain operators, and (2) provinces that are regional growth centers and other tourist destinations –the implementation of the AEC, as well as, the increasing popularity of traveling to secondary destinations. The expansion of the hotel industry is mostly centralized in top destinations for international tourists. The performance of hotel businesses directly correlates with tourism conditions. More precisely, the revenues are related to the number of guest arrivals at the accommodation, lengths of stay, and room rates. In recent years, the number of rooms has been growing faster than the number of guest arrivals and it has caused room oversupply in certain areas. Also, there are still competing products, such as apartments and condominiums for daily rental services (even though it is illegal, but punishment is not strictly imposed). This makes the occupancy rate in Thailand each year stay at an average of 60-65%, not as high as Hong Kong (80-85%) and Singapore (80-90%) (http://www.thaiwebsites.com/tourism.asp, 2019).

2.2 Related Research

This section reports findings from research related to hotels' service quality, consumers' satisfaction, and issues of concern for hoteliers.

Mmutle (2017) studied customers' perception of service quality and its impact on reputation in the hospitality Industry. Customer satisfaction and the management of their expectations are a strategic component to the sustainability of any organization. In the hospitality industry, hotels are attempting to obtain augmented customer satisfaction by concentrating on the quality of service they provide to guests. The researcher examined the customers’ perception of service quality and its impact on a selected hotel’s reputation. The findings indicated that service quality has an impact on hotel reputation as a poor or good service provider, and that the customers and service providers have more or less similar notions of what service quality entails. The hotel departments have mechanisms and strategies for meeting and exceeding customer satisfaction and especially of dealing with customer complaints in sustaining organizational stability.

Markovic et al (2010) measured perceived service quality using SERVQUAL: A Case Study of the Croatian Hotel Industry. The purpose of the study was to examine customers' perceptions of service quality in the Croatian hotel industry. The researcher assessed the perceived service quality of hotel attributes to determine the factor structure of service quality perception. The study results indicated the rather high expectations of hotel guests regarding service quality. 'Reliability,' 'empathy and competence of staff,' 'accessibility' and 'tangibles' are the key factors that best explained customers' expectations of hotel service quality. The findings can be used as a guide for hotel managers to improve the crucial quality attributes and enhance service quality and business performance.

Tabaku (2016) examined the service quality in the hotel sector in the Albanian context. The service quality is considered an important factor in generating customer satisfaction and repurchase intention. The researcher assessed the quality of the service offered by the hotels in the Albanian coast to identify the effect of service quality on the satisfaction of hotel customers. The findings showed the significance of the tourists’ perceptions about the service quality and the impact of the perceived service quality on customer satisfaction for hotel guests. Businesses and institutions in the hotel sector have a better understanding of the factors from the customer’s point of view to create and maintain high service quality for customer satisfaction.

Keshavarz (2015) investigated of the hotels' service quality and its effects on tourist loyalty in the Malaysian hotel industry. The population was international tourists in 4 and 5-star hotels located in Kuala Lumpur; the sample was selected based on the cluster sampling method. The result pointed to the significant effect of pricing on tourists` expectations of hotels. Moreover, tourists` expectation had a significant influence over perceived service quality but did not influence their satisfaction. This study supports tourist satisfaction and perceived service quality as having a significant effect on tourists` loyalty toward hotels. This research is helpful for hoteliers to plan new strategies for attracting more tourists to boost economic development in Malaysia

Burhan (2018) analyzed the service quality and satisfaction of tourists in Tanzania’s hotel industry to find out how consumers (tourists) perceive service quality and whether they are satisfied with services offered by hotels in Tanzania. The study was conducted in tourist hotels from Dar-es–salaam, Tanzania to determine the overall service quality perceived by tourists in Tanzania hotels and identify dimensions that bring satisfaction to the tourists. The research findings revealed the overall service quality perceived as low (-17.4)--meaning expectations exceeded perceptions of services. Thus, the actual hotel services offered to tourists in Tanzania are less than what was expected because most dimensions of service quality pointed to the tourists' dissatisfaction. Thus, the Tanzanian hotels have to improve performance on all dimensions of service quality regarding tangibility, reliability, responsiveness, assurance, empathy, and pricing in order to increase tourists' satisfaction and enable them to maintain their competitiveness with other countries.

Muslim et al (2013) examined the relationship between the service quality dimension and customer satisfaction in the Malaysian hotel industry. A nonprobability sampling technique with a convenient sampling approach has been used in the study. The majority of the hotel customers were satisfied with the overall quality of the service provided by their hotels. The findings suggest that the service quality dimension makes a significant contribution to the prediction of customer satisfaction.

The study of Wiriyakitjar & Wonglorsaichon (2013) compared the differences of the desired service quality expectations of hotel customers, as well as classified the service features most relevant to hotel guests. A modified SERVQUAL scale was employed as the research instrument to achieve the result, and the five-dimension scale was used: confidence, professionalism, empathy, tangibles, and competitiveness. The study sample involved family-run and owner-operated hotels in Chiang Mai, Thailand. The findings indicated that "competitiveness" is the highest rank among the five service dimensions expected by hotel customers. This signifies that the hotel customers are concerned with service standards in the hotel industry. Inferential analyses showed that there are significant differences among hotel customers in their service expectation dimensions with different variables of visit, age ranges, and levels of income.

3. Research Methodology

This research used a questionnaires as the main tool to collect quantitative and qualitative data. Quantitative data dealt with the relationship between one aspect (an independent variable) and another (a dependent variable) and the service quality in five dimensions: (1) reliability, (2) assurance, (3) tangible, (4) empathy, and (5) responsiveness. The researcher tried to quantify the relationship between variables featured in this study like demographic profile, customer behavior, and service expectation and perceived service in 4-5 star hotels inside Thailand. Qualitative data were obtained from the respondents' viewpoints as hotel customers regarding their expectation and perception of service quality.

3.1 The Respondents

Tourism Authority of Thailamd (TAT) reported in 2019 the number of tourists and 4-5-star hotels: 41 million international tourists and 120 million domestic tourists, and 156 4-5 star hotels/resorts on the list of Hotel Association of Thailand. The researcher used purposive sampling technique to collect data from 478 respondents/ customers of the 4-5 star hotels in Thailand.

3.2 Research Instrument

The study used both primary and secondary data to understand consumer behavior toward service products in tourist lodging or to identify the customers' different attitudes toward service quality inside 4-5 star hotels in Thailand whether their service expectation is higher than the perceived service. Survey questions were in four sections: (1) demographic profile, (2) tourists' behavior in the 4-5 star hotels in Thailand, (3) service quality from service expectation and perceived service in 4-5 star hotels in Thailand, and (4) recommendations from the respondents via the open-questionnaire.

The survey questionnaire examined the respondents' satisfaction with service quality on a Likert scale to measure responses on service quality, ranging from 1 = not important, 2 = somewhat important, 3 = important, 4 = very important, 5 = extremely important. This was to assess the factors of service quality of tourism accommodation in 4-5 star hotels in Thailand. The researcher wanted to assess service quality in terms of service expectation being compared with perceived service in five dimensions of SERVQU: reliability, assurance, tangibles, empathy, and responsiveness.

3.3 Data analysis

The researcher analyzed the obtained data by descriptive statistics: frequency, percent, mean, and standard deviation, along with inference statistics: paired-sample t-test by the computer software for Windows.

4. Results and Discussion

4.1 Demographic Variables

The respondents' demographic variables are presented in Table 5 as shown below.

Table 5: The Respondents' Demographic Variables

Variables	Details	Frequency	Percent
Gender	Male	239	50.0
	Female	239	50.0
Age group	Less than 18	100	20.9
	19-30	158	33.1
	31-40	123	25.7
	41-55	71	14.9
	Older than 55	26	5.4
Marital status	Single	256	53.6
	Married	177	37.0
	Divorced/Widowed	45	9.4
Level of education	Lower than bachelor degree	217	45.4
	Bachelor degree	199	41.6
	Higher than bachelor degree	62	13
Occupation	Student	149	31.2
	Officer	75	15.7
	Business owner	127	26.6
	Employee	103	21.5
	Retiree/Unemployed	23	4.8
	Others	1	.2
Monthly income (baht)	15,000 or less	177	37
	15,001-25,000	61	12.8
	25,001-35,000	145	30.3
	35,001-45,000	38	7.9
	45,001-55,000	37	7.7
	More than 55,000	20	4.2

4.2 Customer Behavior

Customer behavior in terms of decision is shown in Table 6. The respondents made their decision on selecting the 4-5 star hotels in Thailand: 66.5 percent decided to use the hotel by themselves, 20.3 percent depended on the family like father, mother or relative, 12.6 percent selected the hotel by recommendation from their friends or girl/boyfriends, and less than 1 percent made their selection by suggestions from other persons.

Table 6: Customer's Decision on Selecting 4-5 Star Hotels in Thailand by Frequency and Percent

Customer's decision	Frequency	Percent
Own self	318	66.5
Father/Mother/Relative	97	20.3
Friends/Boy-Girl fiend	60	12.6
Others	3	.6

Table 7: Types of Hotel Rooms Selected by Customers

Types of Rooms	Frequency	Percent
Standard/Superior room	163	24.2
Deluxe (pool view, grand view, family)	199	41.7
Suite and executive floor (executive, business, honeymoon, family)	111	23.3
Others	4	.8

Table 8: Customers' Selection in 4-5 Star Hotels in Thailand

Factors	Frequency	Percent
Location	125	26.2
Facility for the service and comfort	96	20.1
Extra function (spa, swimming pool, fitness, executive lounge, etc.)	99	20.8
Price	47	9.9
Security	36	7.5
Quality and standard of Food & Beverage	36	7.5
Environment (garden, luxury building, green, etc.)	38	8.0
Others	-	-

Table 9: The Period of Stay in 4-5 Star Hotels in Thailand

Period of Stay	Frequency	Percent
Normal day (Monday - Thursday)	105	22.0
Weekend (Friday, Saturday, Sunday)	122	25.5
Holiday (New year, etc.)	142	29.7
A special day (Honeymoon, Birthday, etc.)	103	21.5
Others	6	1.3

Table 10: The Selection of 4-5 Star Hotel Location by Region in Thailand

Region	Frequency	Percent
Center	156	32.7
East	116	24.3
North	65	13.6
North-East	77	16.1
South	63	13.2

Table 11: Selection of 4-5 Star Hotel Location by Planning/Unplanning

Travel Planning/Unplanning	Frequency	Percent
Planning before using the hotel product	337	70.5
The unplanned or abrupt decision	140	29.3

4.3 Service Quality (SQ), Service Expectation, and Perceived Service

The service quality was compared between service expectation and perceived service in five dimensions of reliability, assurance, tangibles, empathy, and responsiveness. As shown in Table 12, the mean of the respondents' service expectation is higher than that of perceived service. The approximate mean of service expectation is 4.95 and perceived service is 4.3527, suggesting the customers' service expectation in 4-5 star hotels quite high. The perceived service reveals descending scores of five dimensions of service quality: reliability = 4.40, assurance = 4.36, responsiveness = 4.34, tangible = 4.34 and empathy = 4.31. As shown, the perceived service quality in this study was an expectation not being met in which ES > PS (Unacceptable Quality).

Table 12: Service Expectation and Perceived Service in 4-5 Star Hotels inThailand

Service Quality	Service Expectation		Perceived Service	
	Mean	SD.	Mean	SD.
Reliability	**4.9464**	**.24665**	**4.3977**	**.50583**
Staff ability to solve problems and help customers.	4.95	.254	4.42	.609
The employees are honest in their work.	4.95	.250	4.40	.602
Service is a clear procedure, rapid and accurate.	4.95	.250	4.37	.607
Assurance	**4.9477**	**.25149**	**4.3648**	**.56474**
The good image of the hotel.	4.95	.246	4.36	.611
The staff has a professional service personality.	4.95	.269	4.37	.651
The staff gives advice and replies to the request correctly.	4.95	.246	4.36	.647
Tangible	**4.9430**	**.25804**	**4.3413**	**.55963**

Service Quality	Service Expectation		Perceived Service	
	Mean	SD.	Mean	SD.
The hotel has received awards/certifications at the national/international level.	4.94	.257	4.37	.643
Various facilities and services (swimming pool, room service, coffee shop, bars, spa, etc.).	4.94	.261	4.34	.655
The environment and security systems are proper.	4.95	.269	4.32	.643
Empathy	**4.9477**	**.23948**	**4.3079**	**.59281**
Caring and pay attention to customers with individual services expectation.	4.95	.246	4.31	.652
The staff is sympathetic to the customers.	4.95	.242	4.31	.691
The customer/staff has the opportunity to express their opinions to improve service competence.	4.95	.250	4.30	.702
Responsiveness	**4.9491**	**.24446**	**4.3435**	**.59273**
The staff has good human relations and willing to deliver services.	4.95	.250	4.36	.643
The staff has a personality /enthusiasm for problem solving and assistance.	4.95	.246	4.36	.675
Service delivery is quick and accurate.	4.95	.243	4.30	.719
Total	**4.9468**	**.23926**	**4.3527**	**.48314**

4.4. Comparison of Service Quality by Paired t-test Analysis

From the Table 13, the researcher compared the dimensions of service quality in the hotels; the result showed the comparison of service expectation (E) with perceived service (P) as significantly different at 0.05. The results revealed that the clients of 4-5 star hotels in Thailand found service expectation (E) and service perception (P) in 4-5 stars hotels were different in five dimensions of service quality.

Table 13: Mean, S.D and Paired Sample t-test of Service Quality

Dimensions of Service Quality	**Service Quality**		**T**	**P**
	Mean	**S. D**		
Reliability	.54786	.50768	23.912	.000
Assurance	.57687	.57999	22.017	.000
Tangible	.60014	.57626	23.077	.000
Empathy	.63747	.61154	23.098	.000
Dimensions of Service Quality	**Service Quality**		T	P
	Mean	**S. D**		
Responsiveness	.60692	.60763	22.133	.000
Total	.59388	.49652	26.476	.000

* Significance level = 0.05

5. Conclusion and Future Research

5.1 Conclusion

The study investigared impacts of service quality on tourists' selection of lodging of 4-5 star hotels in Thailand. For a tourism destination to reach achievement in attracting customers to spend time in selected accommodation, hoteliers need to recognize the target markets to be able to customize their service products to suit needs of different customers. Service Products play an important role in 4-5 star hotels in Thailand regarding service standards. This research showed five dimensions of service quality as an essence of good management and customer service implementation for success. The findings of this research showed that most respondents have their own decision on the selected hotel and its location to spend time on their holiday. The market segment also accounts for tourists' accommodation in the 4-5 star hotels at a reasonable price for weekdays and weekends. Hoteliers need to be well aware of the gap between customers' expectation and service perception toward service quality in five dimensions as studied and reported in this study. This is meant to create customers' satisfaction in the long run and attract them to come back as loyal clients of hotel products and services.

5.2 Future Research

This study identified the gap between customers' expectation and service perception of service quality experienced in lodging at 4-5 star hotels in Thailand. The researcher found that the gap as such existed as informed by the respondents in the study. In addition to the issues on service quality, it would be possible to investigate further into other related areas in 4-5 star hotels, particularly crucial determinants, such as *service management*, *staff competency*, and *work quality*. Future research could be carried out in different tourist destination contexts of major cities, outer provinces, or regions in the country. This is to have a comprehensive picture of customers' choice of accommodation for their varied needs so that hoteliers can adjust their service provision management effectively.

6. The Author

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Potential of Chinese Herb "*Cordycep militaris*" as a Medicinal Food

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Abstract

Cordyceps militaris is a parasite fungus which contains abundant nutritional bioactive compounds and extensively used as a traditional Chinese medicine (TCM) as well as tonic food. Many researchers reported that *Cordyceps militaris* possessed various pharmacological activities that benefit human health. In the context of culinary medicine which blends art with medicinal science, this paper reports *Cordyceps militaris* as in vitro scientifically proved as a potential source of therapeutic agent and a functional ingredient for health or supplement food with ethnomedicinal claims.

***Keywords**: Cordyceps militaris, crude extract, pharmacological properties, antioxidant, antimicrobial, health food*

1. Rationale and Background of the Study

Cordyceps militaris, a pleomorphic parasite fungus, has been widely known for their ability to synthesize various kinds of bioactive compounds (Xiao & Xiong, 2013; Wong et al., 2007; Yu et al., 2006; Ng & Wang, 2005; Shrestha & Sung, 2005). It was categorized into more than 400 species and many of them, i.e, *Cordyceps sinensis*, *Cordyceps militaris*, *Cordyceps cicadae* and *Cordyceps ohioglossides* have been well recognized as sources of functional food and folk medicine due to their pharmacological efficacy (Xiao et al., 2009; Wong et al., 2007; Yu et al., 2006; Ying et al., 1987). *Cordyceps sinensis* is considered the most popular one that has been widely used as a traditional Chinese medicine (TCM) for centuries. However, since its high specific growth environment, *C. sinensis* is rare to find in nature and annual harvests are decreasing which lead to its incredibly high price (Lin & Li 2011; Feng et al. 2008).

Due to rarity and expensiveness of *C. sinensis*, other Cordyceps, such as *Cordyceps militaris* has been used for substitution (Yang et al. 2009). There were many reports revealing that *C. militaris* even possessed a higher level of some bio metabolic substances than those found in *C. sinensis* especially cordycepin (Zhong et al., 2017). Cordycepin, an important bioactive component of *Cordyceps*, is well known for promoting human health and scientifically proved for its broad spectrum of therapeutic potentials including anti-inflammatory, anti-oxidant, neuroprotective, cardioprotective, antidiabetes, renal interstitial fibrosis, sexual dysfunction, anti-asthmatic and anti-cancer (Patel & Goyal, 2012; Yue et al., 2012; Zhang et al., 2012 a, b; Lee et al., 2011a, b; Wang et al., 2011; Das et al., 2010; Zhou et al., 2008; Ng & Wang, 2005; Mizuno, 1999). With its less expensive and remarkable efficacy, a number of studies aimed to investigate its roles on pharmacological action and potentiality in various disease treatments in order to develop new drugs for modern medication (Hwang et al., 2016; Ruma et al., 2014; Park et al., 2012; Oh et al., 2011; Park et al., 2009 a, b; Won & Park 2005).

According to the advancement on cultivation techniques, it is possible to produce *C. militaris* commercially with high yield and high productivity of bioactive compounds as well as isolated and concentrated via extraction process. The extract obtained from *C. militaris* has been extensively investigated for its therapeutic properties and numerous clinical activities (Park et al., 2009 a, b; Rao et al., 2010; Won & Park 2005; Yu et al. 2007). However, to our best knowledge, drug action and dose consumption of the extracts were varied due to differentiation of cultivation protocol, extraction technique and active ingredients embedded in it.

In this study, the researchers aimed to (1) investigate the in vitro pharmacological effect of crude extract received from *C. militaris* TOLA00 which was cultivated by solid state fermentation using a proprietary medium formulation, and (2) explore the possibility of developing this variety as an ingredient in health/medical food.

2. Material and Method

2.1. Raw material

Preparation of C. militaris TOLA00 (CMTOL) crude extract

C. militaris TOLA00 (CMTOL) was a gift from Thai Orchids Lab Co.,Ltd., Sampran, Nakhon Pathom, Thailand. The culture was cultivated using solid state fermentation until certain period of time to reach its harvest. The sample was dried and ground into small particles and sent to Origin Plant Co., Ltd., Thailand, for extraction. Ethanol extraction was conducted with the ratio of CMTOL: ethanol equal to 1:10 under 50°C for 5 days. The solid was discarded by filtration and the filtrate was subjected to rotary evaporator for ethanol removal for crude extract of CMTOL being obtained. Analysis of cordycepin and adenosine contained in the crude extract was done using HPLC method. The crude extract was kept in a glass bottle under -28°C in this experiment.

Microorganism and chemical

Microorganisms used in this study were both gram positive and negative, e.g., *Acinetobacter baumanii* MDR I, *Acinetobacter baumanii* MDR II, *Enterococcus faecalis* VRE, *Escherichia coli* ESBL, *Escherichia coli* P174 ESBL, *Klebsiella pneumoniae* ESBL, *Pseudomonas aeruginosa* MDRI, *Pseudomonas aeruginosa* MDR II, *Staphylococcus aureus* MRSA I, and *Staphylococcus aureus* MRSA II. All chemicals used were of analytical grading.

2.2. Anti-inflammatory assay of CMTOL crude extract

Anti-inflammatory was determined as the inhibition effect upon protein denaturation using the modified method of Mizushima & Kobayashi (1968). The crude extract CMTOL was diluted to the concentration of 625, 1,250, 2,500, 5,000 and 10,000 µg/mL. Pipette 100 µL of each concentration mixed with 500 µL of 1% bovine serum albumin then let the mixtures to stand at ambient temperature for 10 minutes. The mixtures were heated at 51°C for 10 minutes and let cooled. The absorbance was measured at 660 nm by using acetyl salicylic acid as positive control.

2.3. Anti-oxidant assay of CMTOL crude extract

Diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay (Blois, 1958)

100 µL of 0.2 mMol DPPH solution was pipetted to microtiter plate, then an aliquot (100 µL) of CMTOAL crude extract was added. The mixtures were left for 30 minutes in a dark place and the absorption was measured at 517 nm. The calibration curve was also established using vitamin c equivalent antioxidant capacity (VCEAC) by solution of L-ascorbic acid in methanol was analyzed in the same test protocol as a respective sample.

Folin-Ciocalteu colorimetric assay (Singleton et al., 1999)

100 µL of the CMTOL crude extract was mixed with Folin-Ciocalteu's reagent (100 µL, previously diluted with water 1:10, v/v) and 7.5% sodium carbonate (80 µL), respectively. The mixture was allowed to stand for 30 minutes at ambient temperature for color development and the absorbance was then measured at 765 nm. Gallic acid was used to conduct the calibration curve.

Hydrogen peroxide scavenging activity (Halliwell et al., 1987)

An aliquot (850 µL) of the CMTOL crude extract at different dilution (625, 1,250, 2,500, 5,000 and 10,000 µg/mL) was added to 150 µL of 4 mM Hydrogen peroxide solution in phosphate buffer (0.1 M, pH 7.4). The solution was incubated for 10 minutes and the absorbance measurement was performed at 230 nm where butylatedhydroxytoluene (BHT) was used as positive control.

Anti-lipid peroxidation (LPO)

Thiobarbituric acid reactant substances (TBARS) assay was used to analyze the inhibition of lipid peroxidase as described by Ruberto et al. (2000) with some modification. Briefly, egg yolk was diluted to 10% (w/v) with KCL solution being added to 50 µL of different concentration CMTOL crude extract. Addition of 20% acetic acid (pH 3.5) 300 µL and thiobarbituric acid (TBA) 300 µL were put into the previous solution, then being mixed with a vortex mixer. Incubation of the mixtures was at 95°C for 1 h, and left cool at ambient temperature. Added was 750 µl of butanol, followed by centrifugation at 3,000 rpm for 10 minutes. Supernatant was absorbance measurement using ELISA reader at 532 nm.

Anti-oxidative low density lipoprotein (LDL) ability was also determined. Mixed was 9 µL of human low density lipoprotein (LDL) with 10 mM ferrous sulphate 191 µL and 100 µL of CMTOL crude extract at different dilutions (625, 1,250, 2,500, 5,000, 10,000 µg/mL). After that, 15% trichloroacetic acid (TCA) 500 µL and 1% thiobarbituric acid (TBA) 1 mL were added. The mixtures were incubated at 100°C for 10 minutes, then cooled by letting them stand at ambient temperature. Pipette 300 µL of the mixtures was put into microtiter plate and measured for the absorbance at 532 nm using ELISA reader and $CuSO_4$ (pH 7.4) applied as blank.

2.4. Anti-microbial test of CMTOLA00 crude extract

Determination of minimum inhibitory concentration (MIC) was carried out by the microdilution method (Clinical and Laboratory Standards Institute 2008). Gram-negative and gram-positive bacteria mentioned above were used for an anti-microbial test. Those respective bacteria from freeze vial on nutrient agar were re-cultured and its turbidity was adjusted using spectrophotometer measurement at 625 nm to achieve concentration of 1.5×108 CFU/mL. Different dilutions of CMTOL crude extract were added to the wells containing 100 µL of tryptic soy broth (TSB) and 10 µL of inoculum in microtiter plate. The microtiter plate was incubated at 37 °C for 15 h and the absorbance has been measured at 620 nm. Gentamicin at successive concentration was used as control. All experiments were repeated 3 times.

3. Results and Discussion

The CMTOL crude extract obtained from ethanol extraction contained cordycepin and adenosine in the value of 0.94% and 0.04%, respectively and the extraction yield (% based on cordycepin content) was 35.95%. Successive dilutions were made and submitted to evaluate various therapeutic properties, i.e., anti-inflammatory, anti-oxidant and anti-microbial where all experiments were repeated 3 times.

3.1. Anti-inflammatory activity

The CMTOL crude extract was subjected for its potent of protein denature inhibition. BSA was denatured by heat treatment and different doses of the extract being tested to prevent BSA denaturation as shown in Figure 1.

Figure 1: Effect of CMTOL Crude Extract on Preventing BSA Denaturation.

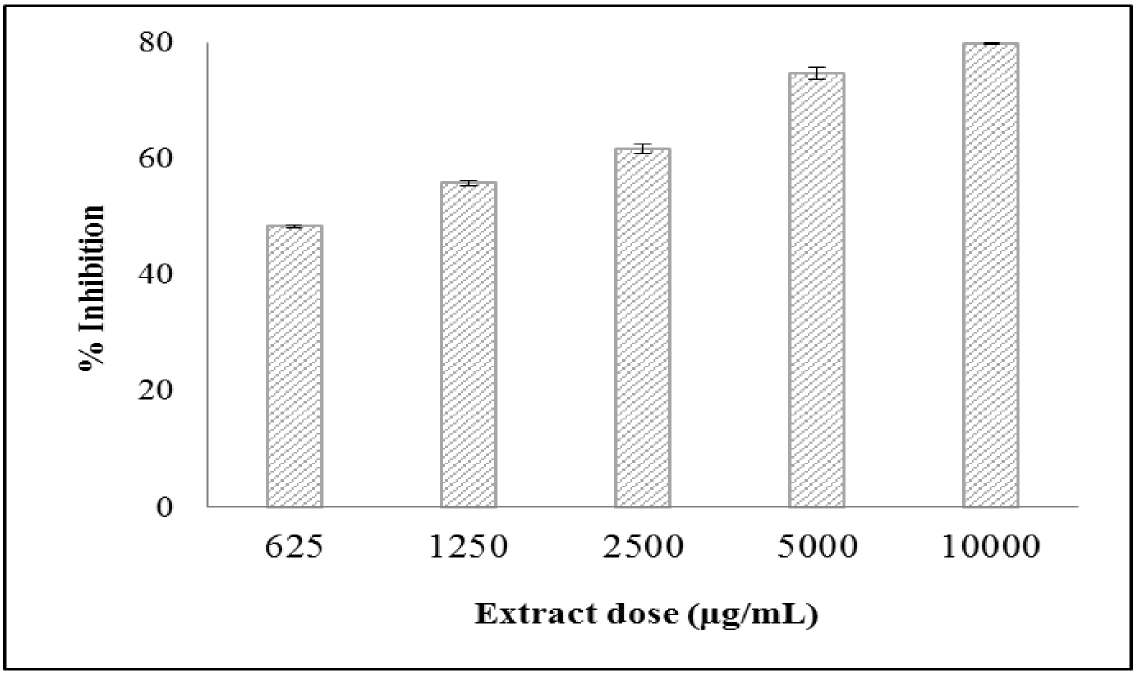


Figure 1 shows that the inhibition of BSA denaturation was dose-dependent. At 625 µg/mL, CMTOL demonstrated an inhibition effect of BSA denaturation more than 50% and increased to almost 80% when the dose reached 10,000 µg/mL. Protein denature was the cause of inflammatory (Perumal et al., 2008); therefore, the ability in preventing protein denaturation suggested that the CMTOL crude extract undoubtedly possessed anti-inflammatory activity. Rosner et al. (2001) reported that BSA consists of two binding sites which are aromatic tyrosine rich and aliphatic threonine and lysine residue region. To be able to inhibit BSA denaturation, those therapeutic compounds existing in the extract might activate the tyrosine motif rich receptor dually with threonine that regulate signal transduction biological pathways for their overall biological action (Rosner et al., 2001; William et al., 2002b). It is also noteworthy that those compounds which react to aliphatic lysine residue on BSA may possess anti-oxidant or anti-cancer properties in the same way as polyphenol substances (Kawabata & Packer 1994; William et al., 2002 a, b).

3.2. Anti-oxidant activity

To determine the CMTOL crude extract for its anti-oxidant activity, numerous methods were used to yield the complete anti-oxidant profile of the respective sample. The results are shown in Table 1 and Figures 2-3.

Table 1: Scavenging Effect on DPPH Free Radical, Total Antioxidant and Total Phenolic Compound Presented in 0.1g/ml CMTOL Crude Extract

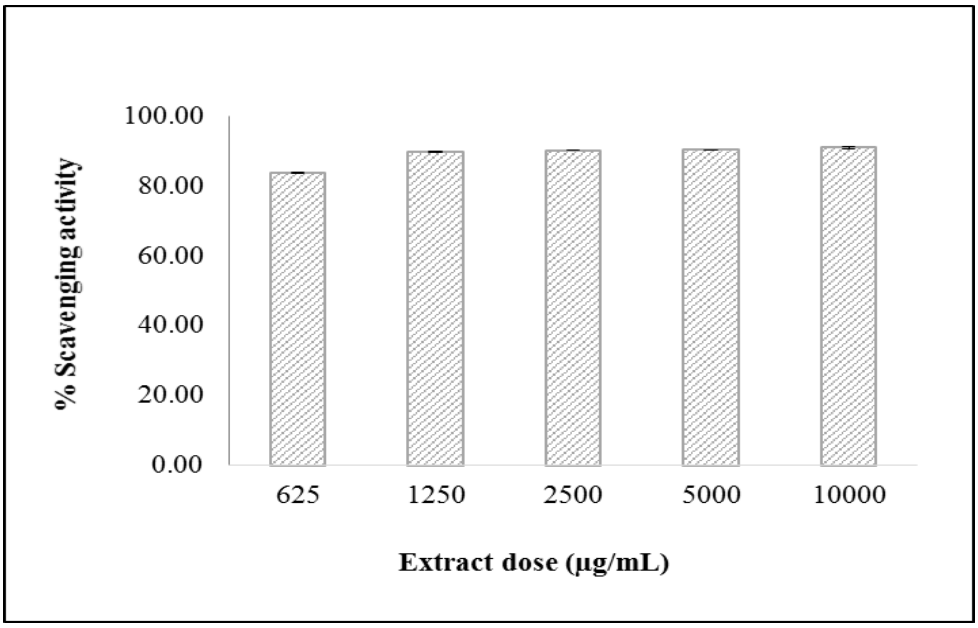
Anti-oxidant assay	Average±SD
Total phenolic compound (µg gallic acid equivalents) (GAE)/ 0.1g dry matter)	715.53±0.01
DPPH scavenging activity (%)	77.76±1.87
Total anti-oxidant (µg of vitamin C equivalent/0.1 g (dry matter)	64.30±3.38

The total phenolic compound of the crude extract showed high value with 715.53 µg gallic acid equivalents (GAE)/ 0.1g dry matter. This result supported the same finding reported earlier by several publications and indicated that *C. militaris* might able to produce phenolic substances by itself or catalyze them from substrate (Zhang et al., 2012b; Juan & Chou, 2010). DPPH--free radicals which accept electron or proton to become stable--is a quick protocol to test free radical scavenging activity and widely used as an anti-oxidant index (Mokbel & Hashinaga, 2006; Zhan et al., 2006). The CMTOL crude extract possessed DPPH free radical scavenging activity at 77.76% which was similar to the finding reported by Zhang et al. (2012), Zhan et al. (2006), Reis et al. (2013) and Xiao et al. (2015). Some evidences also revealed that consumption of medicinal mushroom which contained anti-oxidants is a way to prevent or reduce over two-third of cancer-related deaths (Borchers et al., 2004; Zaidman et al., 2005).

The results on hydroxyl radicals scavenging of the CMTOL crude extract shown in Figure 2 revealed that scavenging activity of the extract was increased when its dose was higher. The scavenging activity of the extract at 625 µg/mL was very high with over 80%.

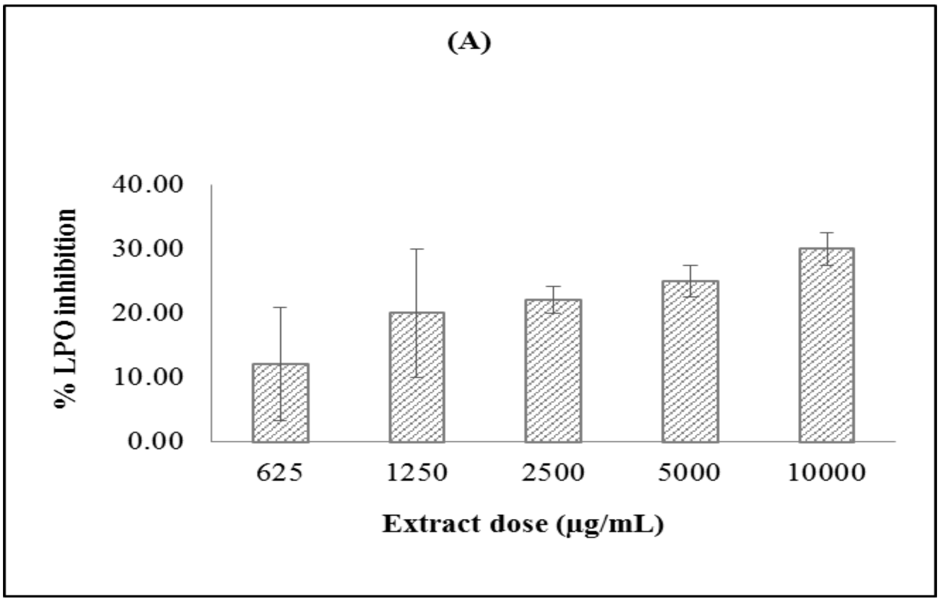
The finding corresponded with those reported by Shen & Shen (2001) and Zhan et al. (2006) indicating *C. militaris* extract as scavenging ability of hydroxyl radicals at 76-80%. Hydroxyl radicals--the most reactive radicals generated during aerobic metabolism--is the form of a number of reactive oxygen species, such as superoxide anion, hydrogen peroxide and nitric oxide which damage biological molecules (Zhang et al., 2012a, b; Badmus et al., 2011; Siddhuraju & Becker 2007). Two mechanisms of anti-hydroxyl radicals were proposed; one was to prevent hydroxyl radicals generating via ligate to metal ions, and the other scavenged the generated hydroxyl free radical (Zhang et al., 2012a, b). This might suggest that the CMTOL crude extract also carried those mentioned anti-hydroxyl radicals activity.

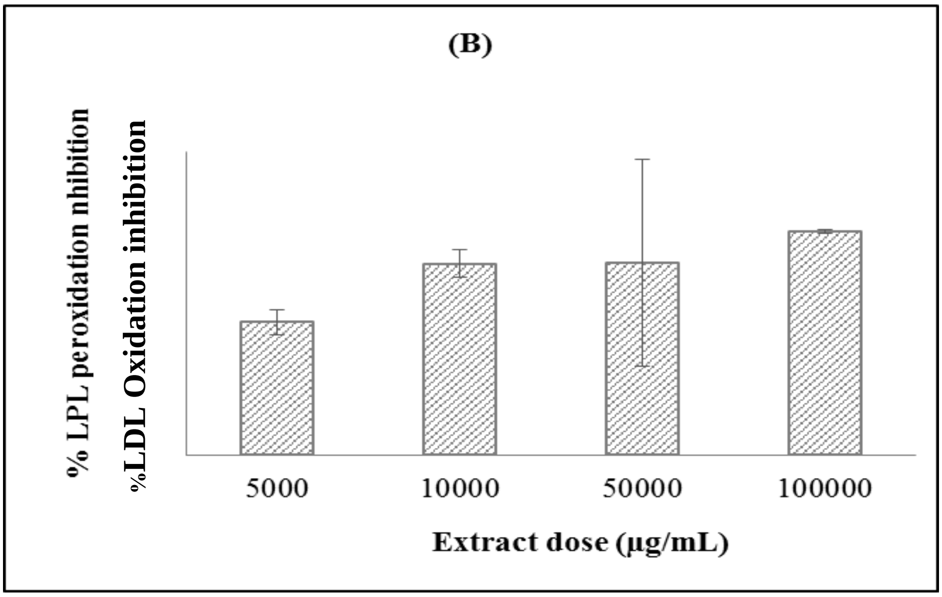
Figure 2: Effect of CMTOL Crude Extract on Hydroxyl Radicals Scavenging Ability



Not only in aqueous matrix, oxidative reaction also occurs in lipid layer in which lipid peroxidation is regarded as the main cause of damaging cellular component and fragmentation of connective tissues (Halliwell & Gutteridge, 1999; Chance et al., 1979). As shown in Figure 3, the CMTOL crude extract appeared to contain LPO and LDL inhibition property in the dose-dependent manner. The extract dose at 10,000 µg/mL performed approximately 30% of LPO inhibition. Many researches also demonstrated the LPO inhibition activity of *C. militaris* extract in a similar manner in support of this finding (Gu et al., 2006; Hui et al., 2006; Zhan et al., 2006).

Figure 3: Effect of CMTOL crude extract as an anti-lipid oxidation: (A) Inhibition ability on LPO, and (B) Inhibition ability on LDL.





Moreover, the CMTOL crude extract also expressed high potential of LDL oxidative inhibition property which over 60% of LDL inhibition was received at the extract dose of 10,000 µg/mL. Oxidized LDL is recognized as the cause of lipid accumulated in arterial wall and leads to atherosclerosis related disease (Steinberg et al., 1989; Cross et al., 1987). Many earlier reports confirmed that treated coronary artery disease patients with anti-oxidant substances have positive effect on cardiovascular condition (Milman et al., 2008; Lee et al., 2005; Tepel et al., 2003; Boaz et al., 2000; Stephen et al., 1996).

3.3. Anti-microbial property

Anti-microbial property of CMTOL has been test against both gram negative and gram positive microorganism where gentamicin was used as positive control and the results were shown in Table 2.

Table 2: Minimum Inhibitory Concentration (MIC) of CMTOL Compared with Gentamicin

Microorganism	(MIC µg/ml)	
	CMTOL crude extract	**Gentamicin**
Staphylococcus aureus MRSA 1	G	0.47
Staphylococcus aureus MRSA2	10,000 (NG)	1.88
Acinetobacter baumannii MDR1	G	>120
Acinetobacter baumannii MDR2	G	>120
Pseudomonas aeruginosa MDR1	10,000 (NG)	0.12
Pseudomonas aeruginosa MDR2	G	0.12
Escherichia coli P174 ESBL	G	0.12
Escherichia coli ESBL	10,000 (NG)	1.88
Klebsiella pneumonia ESBL	G	7.5
Enterococcus faecalis VRE	G	0.12

Note: G = Growth; NG = No Growth

The results in this study showed that the CMTOL crude extract at 10,000 ug/mL demonstrated itself as the least concentration to inhibit *Staphylococcus aureus* MRSA2 (gram positive), *Pseudomonas aeruginosa* MDR1 (gram negative) and *Escherichia coli* ESBL (gram negative) with no growth detected (MIC). It should be noted that the preliminary test using agar well-diffused method [data not shown in this paper], the CMTOL crude extract also presented the inhibition effect against *Acinetobacter baumannii* MDR2. For *Staphylococcus aureus* MRSA2, the extract even possessed a higher inhibition zone (11 mm) than that found in commercial antibiotics, gentamicin (9 mm). Ahn et al. (2000) reported that *C. militaris* extract using methanol was greatly inhibited toward *Clostridium* species; however, adverse effects on the growth of lactic acid bacteria were not detected. Therefore, *C. militaris* has been considered an interesting rich source of bioactive compound associated with its anti-pathogenic bacteria activity.

4. Conclusion

In the context of culinary entrepreneurship and innovation, this research provided the information concerning some clinical efficacy of *Cordyceps militaris* TOLA00. The results revealed that the CMTOL crude extract possessed various pharmacological properties (in vitro evaluation), e.g., anti-microbial, anti-inflammatory and anti-oxidant which expressed against both free radicals in aqueous and lipid matrix. The finding of the study could support the possibility of using *C. militaris* TOLA00 as a potential natural ingredient to improve the therapeutic effects of *medical food* for some diseases. It could also be commercially developed as a supplement food for health after meticulous retesting for consumers' safety.

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Innovation and Change Management

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Abstract

Organizations are facing environments that are changing rapidly in the context of globalization, especially in rethinking the borders of their markets and encouraging their employees to think globally. Managers in the public and private sectors need to help their organizations to respond and adjust to current and upcoming changes effectively with innovation and change management strategies. In this regard, the researcher conducted a study to (1) study concepts and cases of innovation and change management, and (2) make recommendations on effective innovation and change management. Documentary research and deductive approach of analysis were utilized to find answers to the two identified objectives. The findings pointed to *innovation* as a process by which organizations use their skills and resources to develop new goods and services, new production and operating systems in response to the needs of their staff, customers, and society. The use of *the force-field analysis* can help develop action plans with an equilibrium point in the desired direction to cope with the dynamics of change situations. The three-stage model of the change process could be used to reduce resistance to change. The most effective innovations for change were based on systems theory, participation and empowerment, teams and teamwork, applied behavioral science, action research, and OD interventions. Recommendations were made for public and private organizations to use effective innovations and change management for organizational adjustments.

Keywords: *Innovation, change, management, the force-field analysis, three-stage model of the change process, dynamics of change situations, reduction of resistance to change*

1. Introduction

It has been widely recognized that organizational change and development require management strategies and innovations on the platforms of systems theory, participation and empowerment, teams and teamwork, applied behavioral science, action research, OD interventions, typology of OD interventions, and other related sound theories and cases. Managers in the public and private sectors therefore need to find good adjustments for current and upcoming changes effectively. It is their urgent tasks to come up with innovation and new strategies for change management. In so doing, they need to have good understanding of concepts and cases of innovation and change management to be able to work on required innovations in coping with change (Easton, 1965; Hill & Jones, 1995).

What is organizational change?

Jones (1998) defined organizational change as a process by which organizations move from their present state to some desired future state to increase their effectiveness. To Beer (1980), the goal of planned organizational change is to find new or improved way of using resources and capabilities in order to increase an organization's ability to create value and improve the returns to its stakeholders. Any organization in decline may need to restructure its resources to improve its fit with the environment. In an economic crisis, every organization needs to adjust their resources in order to be consistent with their changing environments. Jones (1998) emphasized that planned organizational change is normally targeted at improving performance at one or more of four different levels: human resources, functional resources, technological capabilities, and organizational abilities.

Organizational change definitely has effects on human resources. Ultimately, an organization's distinctive competencies lie in the skills and abilities of its employees. Typical kinds of change efforts directed at human resources include training and development activities, socializing employees into the organizational culture, changing organizational norms and values to motivate a multicultural and diverse workforce. As the environment changes, organizations often transfer resources to the functions where the most value can be created. An organization can improve the value of its functions by changing its structure, culture, and technology. For example, the change in functions of a product team structure may speed the new product development process (Katz & Kahn, 1996; Nelson & Quick, 1997, Sriboonnark, 1982).

Technological capabilities give an organization an enormous capacity to change itself in order to exploit market opportunities. The ability to improve the way goods and services being produced is to increase their quality and reliability. At the organizational level, an organization has to provide the context that allows it to translate its technological competences into value for its stakeholders. Organizational change often involves changing the relationships between people and functions in order to increase their ability to create value. Changes in structure and culture take place at all levels of the organization and include changing the routines an individual uses to greet customers, changing work group relationships, improving integration between divisions, and changing corporate culture by changing the top-management team (Katz & Kahn, 1996; Nelson & Quick, 1997).

2. Types of Change

In general, change falls into two broad categories: evolutionary and revolutionary change. *Evolutionary change* is gradual, incremental, and specifically focused but *revolutionary change* is sudden, drastic, and organization-wide. Evolutionary change involves the attempt to increase effectiveness of the way an organization currently operates. Total quality management is a type of change process through which organizations attempt to manage incremental improvements in the way work gets done. On the contrary, revolutionary change involves the attempt to find new ways to be effective in doing things, or creating new goals and a new structure. An organization can use one of several approaches to implement revolutionary change to bring about quick results: reengineering, restructuring or innovation.

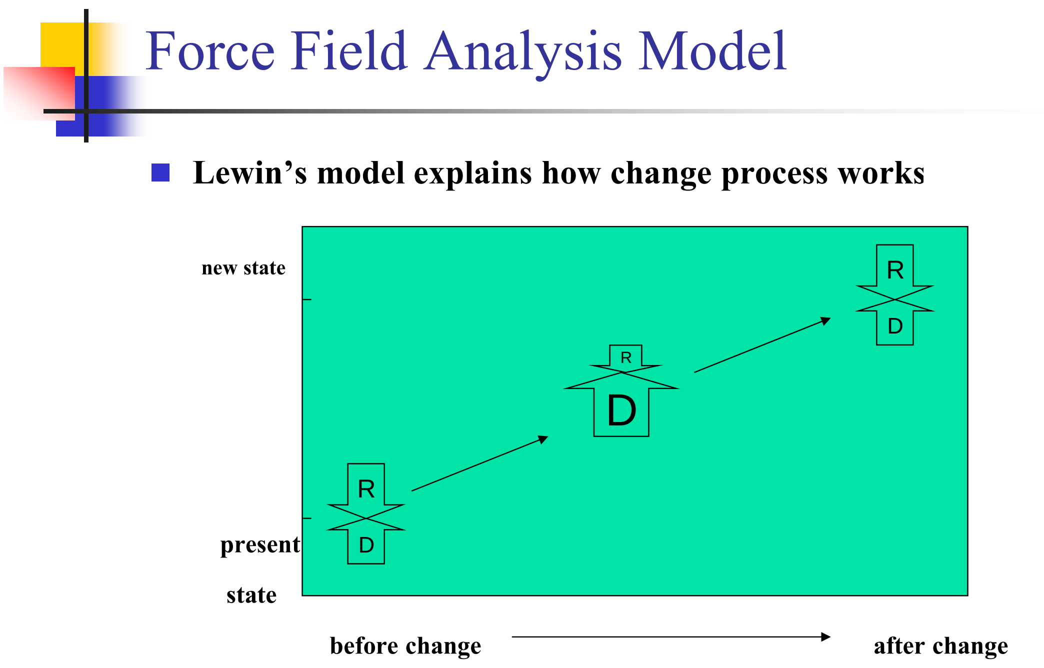
Talking about revolutionary change, we also think about *reengineering* that involves rethinking and redesigning of business processes to increase organizational effectiveness (Hammer & Champy, 1993). It comprises at least four issues: purpose, culture, process and performance, and people. The highlight of this approach is consideration of business processes continuously and replacement of an organization's old systems with new ones (Sriboonnark, 1997). Another form of revolutionary change is *restructuring* that organizations often undergo to remedy deteriorating performance. There are two basic steps to restructuring: (1) an organization reduces its level of differentiation and integration by eliminating divisions, departments, or levels in hierarchy, and (2) an organization downsizes by reducing the number of its employees to reduce operating costs.

Organization change usually comes with *innovation* which is the process by which organizations use their skills and resources to develop new goods and services or to develop new production and operating systems so that they can better respond to the needs of their customers (Burgelman & Maidique, 1988). Innovation can result in spectacular success for any organization, for example, Apple Computer introduced its new personal computer and changed the face of the computer industry. Sriboonnark (2009) gave an example of an innovation in one department of local government in Thailand in launching academic partnership with public universities.

3. Planned Change

Managing organization change needs *planned change* and *force field analysis model* that consists of driving and resisting forces, especially, how to make or build up any organizational change by increasing every driving force over the resisting force. Absolutely, innovation must play an important role in every organizational change process.

Lewin's Force Field Analysis Model



The first idea in the model states: *what is occurring at any point in time is a resultant in a field of opposing forces*. That is, the status quo--whatever is happening right now--is the result of forces pushing in opposing directions. For example, the production level of a manufacturing plant is a resultant *equilibrium point* in a field of forces, with some forces pushing toward higher levels of production and some forces pushing toward lower levels of production. The production level tends to remain fairly constant because the field of forces remains fairly constant with an equilibrium point. (Lewin, 1951; French & Bell, 1978).

With a technique called the force field analysis, we can identify the major forces that make up the field of forces and then develop *action plans* for moving the equilibrium point in one direction or the other. This concept is useful for thinking about the *dynamics of change* situations. (Lewin, 1951; French & Bell, 1978).

4. Three-Stage Model of the Change Process

There are three stages in the Model of the Change Process (Lewin, 1951; French & Bell, 1978).

Stage 1. Unfreezing: Creating motivation and readiness to change through

a. Disconfirmation or lack of confirmation

b. Creation of guilt or anxiety

c. Provision of psychological safety

Stage2. Changing through Cognitive Restructuring: Helping the client to see things, judge things, feel things, and react to things differently based on a new point of view obtained through:

a. Identifying with a new role model, mentor, etc.

b. Scanning the environment for new relevant information

Stage 3. Refreezing: Helping the client to integrate the new point of view into

a. The total personality and self-concept

b. Significant relationships

(Beer, 1980; Sriboonnark, 1982)

5. Reduction of Resistance to Change

According to Oakley & Krug (1993), primary strategies for reducing change resistance are as follows:

1. Communication
2. Training
3. Participation
4. Stress management
5. Negotiation
6. Enforcement

In managing organizational change and development, managers need innovation and change management strategies on the basis of system theory, participation and empowerment, teams and teamwork, applied behavioral science, action research, OD interventions, typology of OD interventions, and change agent and change management.

6. OD Interventions

According to French & Bell (1978) and Luthans (2002), OD interventions include the following:

1. Diagnostic Activities
2. Team-Building Activities
3. Intergroup Activities
4. Survey Feedback Activities
5. Education and Training Activities
6. Technostructural or Structural Activities
7. Process Consultation Activities
8. Third-Party Peacemaking Activities
9. Coaching and Counseling Activities
10. Life and Career Planning Activities
11. Planning and Goal-Setting Activities
12. Strategic Management Activities
13. Organizational Transformation Activities

7. Typology of Organization Development (OD) Interventions

French & Bell (1978) and Luthans (2002) divided Typology of OD Interventions as follows:

1. Individuals:
   - 1.1 Life and career planning activities
   - 1.2 Coaching and counseling
   - 1.3 Education and training to increase skills, knowledge in the areas of technical task needs, relationship skills, decision making, problem solving, planning, goal-setting skills
   - 1.4 Work redesign
2. Teams or groups
   - 2.1 Team building (task or process directed)
   - 2.2 Interdependency exercise
   - 2.3 Process consultation
   - 2.4 Role analysis technique
   - 2.5 Team MBO
   - 2.6 Education in decision making, problem solving, planning, goal setting in group settings
   - 2.7 Quality of work life programs
   - 2.8 Quality circles
   - 2.9 Force-field analysis
   - 2.10 Self-managed teams
3. Intergroup Relations
   - 3.1 Intergroup activities (process or task directed)
   - 3.2 Partnering
   - 3.3 Process consultation
   - 3.4 Third-party peacemaking at group level
   - 3.5 Survey feedback
4. Total Organization
   - 4.1 Management by objectives (MBO)

4.2 Cultural analysis
4.3 Confrontation meetings
4.4 Visioning
4.5 Strategic planning/Strategic management activities
4.6 Survey feedback
4.7 Total quality management

Obviously, innovation and change management strategies involve various variables. The researcher would like to present two empirical cases to clarify and exemplify importance and implication of innovation and change management in public organizations.

8. Empirical Case 1: Competency Development of Pattaya City for Preparing into ASEAN Community

The researcher conducted Empirical Case 1 in the context of Thailand--having officially participated in the ASEAN community since 2015. Pattaya City, one of the most popular tourism landmarks of the country, was selected to illustrate innovation and change management under study. The research objective was to identify managerial competency of Pattaya City in support of the ASEAN community environment by development administration, and valuable theory and model.

The researcher used Systems Theory and Public Management Quality Award (PMQA) as the research theoretical framework. Two hypotheses were:
(1) There are correlations between each PMQA variable and outputs of Pattaya City.
(2) The use of integrated related theories, models, strategies, policies, programs, projects can help increase managerial competency of Pattaya City.

The research instrument was a constructed questionnaire of 194 issues/items of indicators–being validated and held reliability at 0.994. The respondents were 148 officers of Pattaya City at the government's C6-level or above. In finding answers to the hypotheses, the researcher used documentary analyses, a questionnaire, and in-depth interviews. Deductive approach was utilized in data analysis and evaluation (Sriboonnark, 2010, 2015).

8.1 Major Research findings

The results of the study revealed *managerial competency* of Pattaya City at "B" grade or good. "Outputs of Pattaya City" correlated with every variable of PMQA: with "process arrangement" (r=.895), "human resource oriented" (r=.858), "focus on customer and stakeholder" (r=.854), "measurement, analysis, and knowledge Management" (r=.822), "strategic planning" (r=.811), "leading organization" (r=.703), and "organizational attributes" (r=.603). As for Hypothesis 2, the respondents gave information in their in-depth interviews that confirmed applications of integrated theories, models, strategies, policies, programs, and projects in increasing managerial competency of Pattaya City.

8.2 Recommendations

Based on the research findings, competency development for Pattaya City comprised various management platforms in support of innovations by interventions, concepts, theories, guidelines, and development administration and management strategies. Details of these platforms include supply chain analysis, value creation, strategic planning and management, benchmarking, leadership development, survey feedback, conflict management, and competency development. Additional areas in support of innovation and change management were identified: Buddhist Management, Technology Development, Good Governance, Organization Development, New Public Management, Strategic Alliances, Privatization, Team Management, Knowledge Management, Total Quality Management, International Standard Organization, Philosophies of Politics and Administrations, and of Sufficiency Economy. To the respondents in the study, all of these areas/concepts were certainly dependent on managers to apply them in coping with change and come up with adjustments for *competency development* in particular contexts.

9. Empirical Case 2: Administration Development of Autonomous Public Universities in Thailand

The researcher studied change in administration development of fourteen autonomous public universities in Thailand. The objective was to analyze their philosophies, concepts, and principles. Historical, developmental, and holistic approaches were used to study related concepts, principles, and administration theories and administration of autonomous public universities. The researcher also wanted to identify existing problems in their administration regarding causes and effects. It was expected that the findings were to generate guidelines for new administration techniques, strategies, and perhaps a sound 'model of administration development of autonomous public university' (Sriboonnark, 2010, 2012).

9.1 Major Research Findings:

From the historical, developmental, and holistic analyses, the researcher secured the major findings on change in administration development of some autonomous public universities in Thailand as follows:

(1) Autonomous public universities in Thailand gained more independence and freedom In university policy formulation and implementation.
(2) The university policy and administration were decentralized
(3) The economic and management models were applied in the university policy and administration processes.
(4) Some relevant management theories were not integrated into the university policy and administration processes.
(5) The use of 'empowerment strategy' in the autonomous public universities were with some critical problems in having more independence or freedom in power utilization. Some respondents mentioned problems concerning unethical behavior or corruption in administration processes of autonomous public universities under study.

9.2 Recommendations

Based on the research findings on change in administration development of autonomous public universities in Thailand, the researcher would like to call attention to the following:

(1) Sound management theories and concepts should be integrated into administration processes of the autonomous public universities under study.
(2) Quantity and quality of Inputs-Processes-Outputs and Outcome should be focused in

the autonomous public universities' administration system.

(3) Academic freedom and academic excellence should be in the framework of higher educational administration philosophies.

(4) Decentralization in administration should deserve more attention from the autonomous public universities under study.

(5) Quality, efficiency, innovation, and social responsiveness should serve as generic building blocks for competitive advantages.

(6) Leadership and mentoring in good governance should carry transparency in all dimensions of human resource development, administration development, and national development administration.

(7) Corruption and unethical behavior related to public management innovations should be under close monitoring for penalty. The monitoring procedure needs to include balanced mechanisms for innovations for change, specifically benchmarking, reengineering, total quality management, team building and management, ethical behavior development, and innovations—all being integrated into the existing body of knowledge or technology.

The researcher expected that these empirical cases and findings could help clarify the position of innovation and change management in specific areas. Moreover, the related issues should deserve attention from leaders of organizations in their attempt to cope with changing work environments.

10. Conclusion

As reported in this paper, innovation refers to as process by which organizations use their skills and resources to develop new goods and services or to develop new production and operating systems in response to the needs of their customers. In managing organizational change and development, leaders of organizations need to have good understanding of platform knowledge in systems theory, participation and empowerment, teams and teamwork, applied behavioral science, action research, OD interventions, typology of OD interventions, change agent, and change management. It is vitally important for organizations to conduct empirical studies for target results in support of innovations needed for adjustments in the time of change.

The researcher showed in two empirical cases—one on competency development and another on administration development—that specific issues require concrete results for leaders of organizations to gain confidence in implementing innovations in their organizations. Especially, globalization and easternization of our changing world with impacts on public and private organizations need to adopt or adapt change management strategies for organizational benefits and well-being. In addition, public and private organizations are to formulate their optimal policy to guide personnel to sustain effective operations. As shown in this paper, research and development programs/ projects for managing innovation and change definitely play an important role in creating innovations in planned change processes.

11. The Author

Nopparathapol Sriboonnark, Ph.D., is an independent scholar in Management and Public Administration, living in Bangkok, Thailand. His past academic affiliates were public and private higher education institutions in Thailand and his research projects dealt with applications of public administration theories, fieldwork in public management, and empirical studies on major topics of concern in the public sector. His most recent research interest lies in the areas of innovation and change management.

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What Makes a Good College Level Culinary Curriculum in the 21st Century

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Abstract

The culinary industry environment has currently attracted youngsters to the chef profession They have moved along industrial changes, constantly changing behavior, competition, and business practices that require a new set of competencies in culinary talents. Accordingly, culinary programs at the college level need to identify their roles to develop mid-level culinary personnel to grow professionally, and successfully create their own business ventures in the international arena. Such culinary programs should be carefully designed for practical implementation to enable graduates to cope well with challenges in the field. This paper reflects professional concerns over the program features and implementation approaches that should encourage students to acquire and develop their competencies to meet with the present and future demands of the culinary industry.

***Keywords**: Culinary curriculum, college degree, chef schools, chefs, chef education*

1. Introduction

College degrees are supposed to prepare future graduates to fit in the employment requirements both in the domestic and international labor markets while equipping them with competencies needed for growth throughout their career. In this regard, the program design and direction of program implementation must seek to foresee how professional environments relevant to such profession need adjustment for the future. The insights into the present and future professional landscapes should serve as a platform for program design and implementation.

Culinary industry has vastly transformed itself in several aspects while the dine-out spending of the public is incessantly increasing despite periodical economic stagnations (DeSoucey & Demetry, 2016). Diversities following globalization and connectedness have prompted new eating publics with very diverse tastes, preferences, and restrictions making the chefs and culinary entrepreneurs to shift their paradigm about their work as well as business model. The changing environment has led to a new set of competencies expected of college graduates in the area of specialization. This academic paper deals with considerations for a new culinary program design and its implementation approaches. The authors first described the professional landscapes of chefs both in the present and foreseeable perspectives, and then identified major characteristics to distinguish culinary college graduates from their peers. In so doing, the authors discussed conventional practices of program design and implementation to make way to develop the desirable characteristics.

2. Culinary Professional Landscapes

This section describes professional landscapes of a chef to capture a complete picture of the hurdles the chef has to overcome. This is for readers to understand why a successful chef needs new competencies in the current condition and the foreseeable future.

Traditionally, Chef was not regarded as a high status profession but as the team leader of cooks in restaurants or other types of food service establishments (DeSoucey & Demetry, 2016). They usually come from underprivileged backgrounds and start their careers at a very young age as helpers in the kitchen. Little by little, they are trained on the job through an apprenticeship system (Yanal & Kubiena, 2016). Traditional cooks imitate the work of their superiors, the chefs, through observation and sometimes are personally trained in exchange for their hard work, long service years and devotion to the restaurants. Through such a system and working mode, these chefs are experts in a range of dishes and often face difficulties in adapting recipes to changing consumer preferences and market expectations (Yanal & Kubiena, 2016). The responsibilities of traditional chefs are limited in the kitchen, and administrative and managerial works lie in the hands of the restaurant owners. Typical images of traditional chefs are sweating old mustachioed men with pot bellies wearing greyish white aprons working long hours with relatively inferior remuneration and low job security. Because of the work conditions, relatively low pay, and a low success rate as well as the undesirable images, being chefs was not an aspirational job for young people (Yanal & Kubiena, 2016).

Chef professions started gaining social recognition during the 1970s when famous chefs back then introduced the concept of *nouvelle cuisine* and such a concept is widely adopted by both hospitality organizations and consumers (DeSoucey & Demetry, 2016). Nouvelle cuisine is simpler in both taste and preparation, yet more adaptive, modernized and creative in decoration—all showing adaptation of recipes compared to the traditional haute cuisine.

Chef profession has gained higher popularity since the 1980s with advertisement and international expansion of fast food and restaurant chains as well as the diffusion of food and cooking television shows (Muller, VanLeeuwen, Mandabach & Harrington, 2009; Yanal & Kubiena, 2016). Young people aspire to become chefs from seeing cooking shows and media portraying the non-realistic working conditions of chefs (Yanal & Kubiena, 2016). Increasing purchasing power and changing lifestyle toward dual pocket families as well as the 5+2 working mode (five weekly working days plus two days in the weekend) have made eating out in restaurants a normal practice and norms of most urban cultures (Hawkins &

Mothersbaugh, 2010; Jotikasthira & Jotikasthira, 2012). The Chef profession has received its second look from the societies and are accepted to be a trained profession (Yanal & Kubiena, 2016). With higher recognition and more visibility of chefs thanks to media and the heightened standard of culinary work itself as well as the changing lifestyle of cosmopolites, culinary works have earned respect from the society and started to become an aspired job for many young people since then. Professional landscapes of contemporary chefs can be identified as (1) bifurcation of skills, (2) workplace and market diversity, (3) fast changing and globalizing trends, (4) cost-push and competitive economic constraints, (5) changing consumer behavior, (6) yearn for authenticity, and (7) stricter and more internationalized professional practices. These changes in culinary professional landscapes will be discussed in the next part.

Professional Landscapes of Contemporary Chefs

(1) Bifurcation of Skills

Being accepted as a trained profession, there emerged many culinary schools both the state run targeting people with inferior educational and socio-economic status wishing to enter the working life early. The privately owned culinary schools targeting amateurs and people from the middle class upward to either cook as a hobby or pursue culinary works after graduation or after working as white-collared workers for a certain period. Culinary workforce is therefore *bifurcated* (Yanal & Kubiena, 2016). While the culinary schools emphasize training generic culinary skills with limited simple menus, the privately owned culinary schools train their graduates with more advanced culinary skills and other non-culinary knowledge and skills including business, nutrition and basic science which allow them to adapt their cooking skills and manage their works within business settings more effectively. Thanks to their educational, cultural and social capital and language competencies, these new-breed chefs progress their careers vertically quicker and enjoy much higher remuneration (Yanal & Kubiena, 2016). Many of them later became entrepreneurs or high rank executives (DeSoucey & Demetry, 2016; Yanal & Kubiena, 2016). On the contrary, the chefs from vocational schools are easily replaced due to their generic skills, the lack of cultural backgrounds and palette to become autonomous in the kitchen and not adaptive enough to the market demand and customer trends. They are, however, usually recognized by their hard work, patience, and devotion to work (Yanal & Kubiena, 2016). It is clear that culinary workforces are now bifurcated with high and versatile skill chefs highly regarded and remunerated with quick career advancement but lack of commitment and patience; generic skill culinary workers enjoy much less luxury but commit and devote more to their working organization. This situation requires culinary business organizations to manage workforce diversity in terms of socio-economic status, skill diversity and orientation, orientation to work, and career goal. It is obvious that successful food service establishments need both types of culinary professionals. A challenge seems to lie in how to blend them in team synergy consistent with organizational goals and strategies (Bungay, 2011; Jain & Haley, 2009).

Bifurcation of the culinary skills available in the market has led to *workforce diversity* as earlier discussed. However, following business integration at different levels, free flow of production factors including skilled labor in culinary and hospitality sectors also brought about cultural, racial, and linguistic diversity in an organization (Department of Trade Negotiation, 2012; Economic Ingelligence Center: Siam Commercial Bank, 2011). Despite the fact that all international professional hygienic and food safety standards and guidelines applied to almost all culinary business organizations, cultural and linguistic issues still cause perturbations in the workplace. Culinary talents in a modern business setting need to speak more than one language and be proficient in English as a language of wider communication. Moreover, cross-cultural communication is also indispensable for current culinary and hospitality multicultural workforce (Browaeys & Price, 2015; Tourism Personnel Development Institute: Ministry of Tourism and Sports, 2011).

(2) Workplace and Market Diversity

Not only workplace diversity has caused anxieties for culinary and hospitality managers, but *customer diversities* also has added complexity to the current situation. As cultural value determines how one defines delicacy, delight, cleanliness, morality, ethics, and so on, how restaurants and chefs present their food and ingredients is subjective to different groups of consumers (Hawkins & Mothersbaugh, 2010; Hertzman & Ackerman, 2010; Larsen, Brun, Ogarrd & Selstad, 2007). Like other tourism and hospitality sectors, adaptation and change embracing attitude are integral qualities of new age culinarians that need to serve multiracial clientele with different gustatory norms (Jotikasthira et al., 2014).

(3) Fast Changing and Globalizing Trend.

Globalization, connectedness through communication technology, digital peer pressure and reception of international media through both conventional and digital media, lead to *diversity of market demands* and new eating publics that are more risk-taking, internationally well-versed, brave and adventurous (Yanal & Kubiena, 2016). Culinary delicacy is no longer translated into only fine dining in luxurious venues with formal food service procedures but also alternative myriad types of restaurants and food service establishments including modish restaurants, gourmet food trucks, multi-course tasting menu, molecular gastronomy, and note-by-note cuisine (DeSoucey & Demetry, 2016; This, 2013; Yanal & Kubiena, 2016). In the globalized world where cultures intermingle and influence each other, *influence of indigenous and exotic cooking, ingredients and preparation methods* is quite ubiquitous in western cuisines and these have become the factors that make particular dishes distinctive and creative (Assmann, 2017).

Eating publics that used to be vertically segregated according to their purchasing powers and horizontally according to the types of preferred cuisines, have become highly fluid in identifying themselves (Kotler, Kartajaya & Setiawan, 2017). In the world of horizontality, burgeoning creative classes, flat-white hipsters, consumers of alternative dietary cults, culturally rich but economic poor consumers are few examples of the new culinary consumers (Assmann, 2017; DeSoucey & Demetry, 2016; Yanal & Kubiena, 2016). These eating publics are temperamental jumping from one trend to others, targeting themselves and investing on particular cuisines or restaurant types, and they might not pay off when the trends fade off

(DeSoucey & Demetry, 2016). It is compulsory for *all culinary professionals to stay abreast* with current trends in the market, sieve out fads from trends and have a nimble business knowledge to capitalize on the spotted trends in the malleable culinary world.

Trends that shape the present culinary world including molecular gastronomy, note-by-note cuisines, and alternative dietary cults have strongly signaled the increasing importance of scientific knowledge in culinary professionals especially chefs (Abdulsalam, Condrasky, Bridges & Havice, 2017; This, 2013). *Conventional culinary formal education programs* usually contain few aspects of applied nutrition and food science but the studies showed that culinary graduates have inadequate knowledge to work up to the expected health and nutritional standards, not to mention adaptation of recipes and preparation methods (Abdulsalam et al., 2017). Should a chef need to stay ahead from their peers, the chef should possess a deep-enough science knowledge to understand how food chemical and physical qualities have changed through cooking process, chemical qualities of ingredients and the changes of their effects under the juxtaposition of other ingredients under different cooking and presentation methods, losing or incrementing nutritional values, and toxicology food materials under different conditions (This, 2013). *The science knowledge does not only allow chefs to work nutritiously and healthily but also enable them to adapt the existing recipes or to create new ones, such as dishes of the note-by-note cuisine.*

(4) Cost-Push and Competitive Economic Constraints

Cost and availability of business factors of *culinary businesses* pose serious questions to chefs and culinary entrepreneurs especially when new eating publics value highly attractive venues and sophisticated services, authentic ingredients and finest china and cutleries (DeSoucey & Demetry, 2016). Availability of real-time and user-generated information about restaurants as well as the increasing number of restaurants and eateries, an ever-intense competition persists in most cities around the world. Coupled with fast changing market trends and novelty seeking, *chef entrepreneurs and restaurant owners are pressured to stay profitable and competitive amid myriad of business constraints.* Business knowledge and acumen as well as marketing insight and tact are critical ingredients of success in this regard.

(5) Changing Consumer Behavior

Consumers have radically changed their behaviors in all steps of their restaurant consumption experiences. Eating out is beyond food consumption but cultural participation express class and social distinction, group affiliation, and cultivated taste. With the diffusion of social media, peer pressure worked its way to constantly change the aspiration group of the new eating publics (DeSoucey & Demetry, 2016). Social media and customer generated reviews also play a pivotal role in information search of most customers through social media and other customer review applications, such as the fork, yelps, and Pinterest. Customer reviews have become so crucial for marketing success of restaurants. Digital marketing knowledge is, hence, mandatory for both chefs and restaurant owners. New decision and review criteria of new diners have become motivating factors for decision makers while food quality and gustatory pleasure or even value of money spent for the restaurant experiences have become organic factors or qualities already expected from the consumers. What prompts them to make decisions in favor of particular restaurants have become factors like authenticity of the food ingredients, personality and appearance of the chefs, types of clientele, and novelty and creativity of menus (DeSoucey & Demetry, 2016).

(6) Yearn for Authenticity

Authenticity has become the core of restaurant business viability these days starting from ingredients and their production, recipes, sources of ingredients, and preparation and cooking methods. Authenticity has been something that consumers yearn for and chefs incessantly seek to provide. Locality in terms of infusing of local ingredients, local recipes and local food products into the menu helps elevate the attractiveness of the restaurants to the modern restaurant goers. Moral authenticity is another aspect of the concept that can trigger positive words both in physical and digital forms. *Moral authenticity* usually involves local community, farmers, and non-corporate community members in the restaurant supply chain (Assmann, 2017; DeSoucey & Demetry, 2016; Yanal & Kubiena, 2016). Cultural knowledge and creativity are two competencies that enable chefs to constantly come up with authenticity and leap imitation from their competitors.

(7) Stricter and More Internationalized Professional Practices

Globalization has also led to *the mutual adoption of professional and operational standards and practices that most restaurants need to comply with especially those related to hygiene and food safety.* Good Manufacturing Practices, Hazard Analysis and Critical Control Points are two basic standards that most restaurants need to adopt. At the individual level, should chefs aim for career opportunities in foreign countries, it is unavoidable for them to meet the competency standard mutually adopted among member states of the economic blocs (Abdulsalam et al., 2017; Hu, 2010; Soydhurum, 2012).

The discussion of culinary professional landscapes on points (1) to (7) above shows what is needed for a chef to stay competitive in the business and labor market beyond culinary skills. Apart from culinary skills which are taught in more or less similar courses across schools of similar standards, chefs need to possess business *knowledge and acumens, cross-cultural skills and mind-set, critical thinking and creativity, cultural and product knowledge of different regions, consumer insight, vigilance and sensitivity on market information, deep-enough scientific knowledge, aesthetic eyes for art appreciation, digital marketing, adaptability for change embracing attitude and curiosity*. These qualities often can be acquired on the job and/or training programs while others take a long time to develop, if not inherent in particular individuals (Defillipi & Arthur, 1994; Soderquist, Papalexandris, Ioannou & Prastacos, 2010). As a typical college degree program takes 3-4 years to complete, the program should include courses and learning activities that support students to develop such qualities in parallel with culinary skills and knowledge. While these qualities enable culinarians to stay keen in the market, college programs should integrate what and how to distinguish their graduates from the rest of the crowd.

Another aspect that should be seriously considered in designing a program is characteristics of the program that *allow graduates to fully benefit from skill migration opportunities* associated with economic integration and globalization. In so doing, graduates are required to possess competency standards mutually agreed among the member states of the economic blocs or having qualities that are internationally recognized (Tourism Personnel Development Institute: Ministry of Tourism and Sports, 2011). As in the case of the ASEAN Community, food production and food service in tourism and hotel sectors gain benefit from skill migration opportunities. That is, if individual professionals pass the competency test according to the specifications of ASEAN Common Competency Standard for Tourism Professionals (ACCSTP), they can be registered in the mutual recognition arrangement standard (Department of Trade Negotiation, 2012; Petri, Plummer & Zhai, 2012).

3. Qualities of Distinguished Chefs

The most valid proxy of a chef's success is Michelin star awarding and the scheme of the award is largely based on particular chef's creativity and synonym of quality in the gastronomy world (Aubke, 2014). Given capabilities in culinary skills and superb food knowledge and respective charismatic leadership and impeccable managerial skills with staff and suppliers, distinguished chefs outpace their peers through their creativity (Aubke, 2014; DeSoucey & Demetry, 2016). However, the concept of creativity needs to be discussed. For one to be creative in professional realms, apart from having critical thinking and creativity, one needs firm knowledge and high level of skills for creative work in any field (Bleedorn, 1993; Pohl, 2013). Besides, professional creativity is usually judged within the community of practice. Professional community norms and culture must be thoroughly understood unless one's creative work will be labeled an outrage (Aubke, 2014). Immersing oneself in the professional peer group is highly important for a chef to start creating something in his/ her work.

Apart from learning how norms and cultural value of the community of practice work, being a part of a professional network yields various benefits for chefs. It is advisable that chefs should mingle with people from different networks at different levels of expertise and professional experiences in order to gain new fresh ideas and turn creative ideas into innovative results. Instead of being at the center of the networks which consume too much time and resources, chefs need time to reflect and experiment on their creative ideals in actual professional settings. Maintaining membership of the networks at the peripheral level is believed to be profitable for the chefs to improve their creativity (Aubke, 2014). Like other businesses, being part of networks proves to be highly favorable to work performance and is believed to be the determining factors for mediocre performers and the distinguished ones (Jotikasthira, Phakdeephirot & Teeranoot, 2016). In this regard, college culinary programs should be designed and implemented in manners that encourage students to be part of different networks including industrial placement, invitation of guest lecturers and guest speakers as well as arranging professional forums in which students and lecturers can exchange their ideas and discuss with culinary professionals.

4. Current Situation versus Proper Characteristics of College Degree Culinary Programs in Non-English-Speaking Countries

The discussion under section 3 on desirable qualities of both high and distinguished performers in the culinary world must be taken into consideration for the curriculum design and implementation process. While *technical skills* are found to be obligatory for learners in similar standard institutions and can be easily trained for work performance both on the job and through different modes of training, *soft skill competencies* including human, communication, and business competencies tend to be more crucial in identifying exceptional performances from merely good ones (Hertzman & Ackerman, 2010; Kay & Rusette, 2000; Muller et al., 2009; Pratten, 2003; Weber, Finley, Crawford & Rivera Jr., 2009). The actual situation of the college level culinary program in terms of curriculum design and program implementation to be adjusted for the needed characteristics of contemporary chefs is given in the next section.

5. Curriculum Design

To meet with demands of competent chefs for now and in the future, the existing culinary degree programs need to bring in adjustments in eight areas: (1) International versus Local Language Program, (2) Business Knowledge, (3) Applied Science Knowledge, (4) Human Skill and Leadership, (5) Culture Knowledge and Cross-cultural Competencies, (6) Foreign Language Proficiency, (7) Industrial Placement as Opportunities for Knowledge and Skill Applications and Network Establishment, and (8) Double Degree as a Value Added Factor and a Risk Reduction Tool.

(1) International versus Local Language Program

Currently, college degree culinary programs are provided in both local languages and in English in international programs. Despite the fact that the program operation cost for all culinary programs is relatively high by nature, international program tuition fee is much higher than the ones offered in local languages. The cost would be even higher when the programs integrate another program of well-recognized international culinary schools as it involves royalty fees and annuity fees paid to the franchisers. However, the international program mode with the use of English instruction currently serves well for its promises of future high profile chefs for three reasons.

Firstly, culinary, like other globalized businesses, rely on English as the common language of communication. Recipes, using instructions of equipment, work order, and other communication materials are mainly available in English though the language is not spoken in the context of the offered program.

Secondly, English, just like other languages, is acquired through frequent use or immersion in the language over a sufficiently long period. People usually acquire languages through daily *interactions* with locals and native speakers outside language classes. As a result, a number of language courses offered in the program cannot help students master the needed language skills. International programs, therefore, need to provide students with immersion opportunities to interact and acquire English communication skills at the expected level.

Thirdly, since culinary or non-culinary information is usually available in English and other major world languages, those who are proficient can benefit from information access and use the obtained information to be creative in their work as seen in innovative dishes. Aubke (2014) asserted that high level of information reception usually results in higher creativity in the culinary professions. It is therefore important to assure that students feel natural in receiving and sending information in English. Mastery of the language commonly used in the culinary international communities of practice, enables chefs to network with their peers and benefit from information and idea sharing among the network members.

(2) Business Knowledge

At the college degree level, most culinary curriculum include five areas of the subject contents, namely product, culture, management, aesthetics, and technology, where product knowledge and culinary skills are the focal point of the program design and implementation (Hu, 2010; Muller et al., 2009). However, the study of Muller et al., (2009) contended that managerial skills and attitude shaped in graduates especially quality and work commitment did not match the need of actual professional context and employers' expectation. Considering the increasingly tighter business constraints and competition as earlier discussed, business knowledge content should be high enough to help chefs to visualize their work as an independent business unit and to be autonomous in business performance of their own businesses or the business under their purview. Given an increasing importance of small- and medium-sized business enterprises worldwide, business content should be intensive enough to develop students into entrepreneurs sooner or later in their career.

(3) Applied Science Knowledge

Most of the college level culinary programs have few science-related culinary courses including applied nutrition and general sciences that explain food contamination and effects of simple chemicals on ingredient preparation and cooking process at a very cursory level. Students are not encouraged to adapt the recipes, cooking and presentation methods. Certainly, without deep-enough science knowledge, chefs cannot adapt and create their work according to the demand of the market and trends. For a culinary program to ensure their graduates' professional success over their career life span which is often characterized by uncertainties and unpredictability, sufficient science content should be a vital component of the program for future culinary talents to explore, experiment, adapt and create dishes to surprise their customers and get recognition from the community of practice (Abdulsalam et al., 2017; Hertzman & Ackerman, 2010).

(4) Human Skill and Leadership

Most college degree culinary programs include human resource management as a specific course usually for final year students. In fact, chefs need not only human resource management knowledge, but also skills to work as a team under high pressure and demanding situations in creating team synergies. Culinary students should therefore be trained to be dynamic team members and charismatic team leaders from the beginning of the program, for all soft skill competencies take years to develop (Holton III, Coco, Lowe & Dutsch, 2008; Koenigsfeld, Perdue, Youn & Woods, 2011). Looking at the competency list for chefs in various frameworks--both Australian Qualification Framework and ACCSTP, working as a team and leading/ inspiring others in the team are found to be one of the critical aspects in working one's way toward professional advancement in chef and culinary careers.

(5) Culture Knowledge and Cross-cultural Competencies

Most of the degree programs tend to overemphasize culinary knowledge, especially the product knowledge while neglecting the fact that food is part of culture and consumed under cultural contexts and culture is really dynamic (Hawkins & Mothersbaugh, 2010). Without a profound knowledge of one's own culture in relation to other cultures often leads to limitation in work adaptation and creativity. How recipes are created, extracted, presented, served and named can be meaningfully done through cultural discourses and profound understanding of both local and international cultures.

A cross-cultural communication course is often found in most degree programs. Cross-cultural competency depends largely not only on cultural knowledge at both culture-specific and culture-universal levels, but also other transferable skills that can be acquired over a long period through numerous practicing opportunities. Having only one cross-cultural course gives inadequate exposure to multicultural context and diversity (Jotikasthira, Bhutiphunthu & Chuaychoo, 2016). Worse still, cross-cultural communication courses usually teach students using the culture-specific approach by which students are taught customs of different major cultures in comparison to those of their owns instead of how to overcome cultural barriers and how to cope with actual professional situations. Moreover, most courses entirely neglect important aspects of cultures--professional, generational, and racial, and socio-economic status sub-cultures which would affect future educated chefs working in a bifurcated labor pool. To effectively equip students with both sufficient time in the right context, the course should (1) adopt the culture universal approach to teaching, (2) embrace other aspects of culture apart from the national cultures, and (3) expand the appraisal of cross-cultural competency to other courses and community time. It is apparent, therefore, that program chairs and instructors need to reorient their cultural perspective to be able to train and appraise students efficiently.

(6) Foreign Language Proficiency

As mentioned earlier, English fluency is a must for culinary workers in all chef positions, as it serves as the main medium of communication in the world of hospitality. English communication skills are included in most relevant competency standard as well as ASEAN Common Competency Standard for Tourism Professionals (ACCSTP): the language is prerequisite for skill migration and international employment opportunities (Department of Trade Negotiation, 2012). English communication mastery is, therefore, compulsory in this profession. Additional foreign languages, especially French (most gastronomic terms are rooted in French and its culture), add to competitive advantage to chefs as media reception in broadening the cognitive horizons and fuel chefs with novel ideas. Besides, speaking more than one language usually allows chefs to take part in several professional networks where precursors show their creativities.

It should be noted that college level culinary programs in the non-English speaking context are often offered in local languages with a specific number of English language courses. The results often show that graduates from such programs can neither fluently communicate with colleagues and customers nor effectively search and digest information available in English and other languages. To the authors, certain international programs can use English as the main medium of instruction and should offer the third language as an advantage for their graduates in future professional contexts.

(7) Industrial Placement as Opportunities for Knowledge and Skill Applications and Network Establishment

Industrial placement for the period of 3-6 months is usually the case of college level culinary programs that require students to work under the apprenticeship system with prescreened high standard local food and beverage organizations. The industrial placement provide students with good opportunities to apply what they have been trained throughout the program in actual professional contexts. In reality, students barely have chances to work directly under the supervision and mentorship of the professional chefs with distinguished work experience. Instead, trainees are usually assigned to demi or sous chefs to supervise and work side by side with kitchen aids who have only learned their cooking skills on the job. Working with such staff, students have no chance to create new dishes. Certain programs allow students to pass their apprenticeship in foreign countries, usually in large hotels that need a lot of trainees for their simple labor-intensive works during the peak seasons. Apprenticeship aboard, however, has one major advantage in students experiencing time in self-adaptation, practicing of cross-cultural competency, and problem-solving skills. Students usually socialize only with their immediate job supervisors and their peers—thus limiting their development and network opportunities. Unfortunately, working in this type of establishment does not add much to skill mastery needed in students, as they are usually assigned to perform the same tasks repeatedly.

Ideally, apprenticeship for college level culinary programs should be with international small-scale, well recognized (Michelin-starred, for example) food and beverage establishment in foreign countries. In this way, students have actual opportunities to work side by side with chef entrepreneurs or chefs in a cross-cultural context with comprehensive perspective and job scope.

(8) Double Degree as a Value Added Factor and a Risk Reduction Tool

The last important point to students and parents alike is the choice of enrollment. Enrolling in an upscale culinary program in a labor intensive context of volatile demand in the discretionary sector like fine cuisine, might sound somewhat risky in terms of return of investment in human capital in the long run from parents' perspective. To parents, investment in children's education is for a reliable future career and professional growth overtime. In this light, college culinary programs can ensure parents' sense of security with a double degree program which grants to graduates *a general business administration degree,* along with *a degree in culinary arts and technology*. As an example, such an option has currently been offered at

Rattanakosin International College of Creative Entrepreneurship at the University of Technology Rattanakosin, Thailand to meet with the needs of students and parents for job security.

6. Program Implementation

Program implementation is vitally important to work out the designed curriculum into effective program implementation. Program operations focus on course instruction, class size in practicum training sizes, nature of interactions between lecturers and students in class and outside, interaction among students in class and outside, community time activities and student appraisals. As shown in this section, considerations for conventional and desirable program implementation practices are in four topics of concern: (1) Lecture versus Enquiry-Based Learning, (2) Class size in Practicum Training Sizes, (3) Separated or Connected Lesson Planning, and (4) Networking Assistance Activities.

(1) Lecture versus Enquiry-Based Learning

Course instruction greatly affects how students internalize the knowledge and skills taught in classes. In the conventional lecture-based approach, lecturers initiate one-way communication for students to capture the importance the topics, but students may see no relevance to their professional goals. On the contrary, the enquiry-based approach could be a better alternative in that questions given are to link students' career goals to the topics under study and encourage them to research into particular topics and exchange or share information and ideas with lecturers. The lecturers can shift their roles from lecturers to *facilitators* guiding discussion and information search in the areas of the latter's interest. Learning by the inquiry-based approach can challenge learners to relate what they have learned to what they will encounter in their career.

(2) Class size in Practicum Training Sizes

The primary goal of the practicum training is both to educate and practice the culinary skills through empirical experiences with food products, equipment, and the cooking process. Therefore, it should be both on an individual and group basis. Individually, students should be able to perform all steps of the menu preparation and they should, collectively, perform different roles in a team as they need to perform in actual working situations.

Most college degree culinary programs currently let students work in groups of 3-5 members to develop the practicing menus without allocation of clear roles and responsibilities. Usually, there are, in a group, one or two members who take lead while the rest are taking advantage of the situation as free riders. At the end of the course, it often turns out that not more than a half of the class can perform the tasks up to the expected standard. To remedy such a limitation, culinary programs need to impose individual basis to ensure that each student be able to take responsibility for the whole process from the planning stage of the work process, preparation of the menu, and cooking, to presentation of the finished menu. Through this approach, the programs can spot the underperformer and act upon with closer attentions or even remedial lessons.

For students to know how to lead and follow in a team and interact with team members constructively, they need to be assigned with simulated roles and duties in actual professional kitchens. Practicum training appraisals therefore should include not only culinary skills mastery and food knowledge, but also the soft skills in team work and stringency of practice of hygienic and food safety standards.

College level culinary instructors need to shift their expectation from students' learning from culinary skills and food and menu knowledge to other aspects of the culinary work in actual professional contexts; they need to set a new goal on producing future culinary talents who will grow professionally and would one day become entrepreneurs or high-ranking executives. As emphasized by Koenigsfeld et al. (2011), when people climb up the managerial ladders, the less they depend on technical skills but more on transferable skills

(3) Separated or Connected Lesson Planning

It is true that all subject courses in a college level culinary program contribute to the formation of students' competencies but the current practice in teaching tends to separate them in a series of the courses offered. Continuity in a chain-like sequence should be observed by course lecturers and thus team planning of lessons or topics under study should be done in a connected or community mode. Without a common goal in mind like developing students into contemporary chefs or entrepreneurs, course lecturers will plan their course as they see appropriate from their academic and professional perspective. Unfortunately as it often happened, lecturers of the college level culinary programs tend to use their separated approach in lesson planning. This would take the program chair to put things straight for them as a team to link topics, contents, and even appraisal activities together. With this approach, the study of different subject areas can be meaningful to students and they would know that they cannot neglect any subject course after examination. At the end of the study program, they will finally be able to integrate knowledge, skills and other attributes acquired in different courses together and will be ready for their professional challenges lying ahead.

(4) Networking Assistance Activities

Due to limited number of chef lecturers with high academic degrees as required in Thailand's Qualifications Framework, college level culinary programs have to rely on guest lecturers and guest speakers in the field. Guest lecturers and guest speakers can provide not only their teaching services but also industrial insights and network possibilities for certain students who are proactive in making social connections.

Participation in several professional networks and community of practices by arranging professional forums for guest lecturers, lecturers, and invited professionals to meet with students, is a major advantage in program operations. Students will regularly update themselves with the market information and industrial progress in relevant networks; this can also benefit lecturers in the program.

Taking the changing professional landscapes of chefs into account, college level culinary programs, with the primary objective to produce graduates for the employment market and ensure their fruitful career path, need to take all considerations of concern as discussed so far as the focus of their curriculum design and implementation; this is for them to be able to have their graduates who can function and cope well with new challenges in the field of culinary art and technology.

7. Conclusion

The culinary profession has tremendously changed and been exposed to continually change throughout a professional's career path. Bifurcation and diversity of skills, workforces, and customers, much sought-after authenticity, changing behavior, higher business constraints, increasingly stringent enforcement of international standards and professional standard for skill migration, have shed a new light on curriculum design and the direction for program implementation. This academic paper intentionally serves as signpost for cautions to those who have ventured into curriculum design and program implementation of college degree culinary programs. Relevance and practicality are the keys to success in program implementation with an ultimate goal on the graduates as highly qualified chefs and successful entrepreneurs in the circle of the culinary profession.

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Collaborative Filtering for Project Document Assessment of Missing Score Estimation

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Abstract

Measuring project document quality is usually handled by an assessment committee. Sometimes the committee may not cover all assessment issues. This can result in discrepancy of project document quality and evaluation, and thus may affect recommendations given in the project document. The researchers therefore would like to propose *the collaborative filtering technique* to predict scores left unevaluated by the committee. The User-based Collaborative Filtering (UBCF) was used in this research work. It consists of two main steps: similarity calculation and prediction. Experiments were conducted. There were 20 computer project documents assessed by the assessment committees and their assessment scores were collected. Some of the assessment scores were removed randomly and the UBCF was used to predict the removed scores. The experimental results showed that accuracy of the UBCF used in the experiments varied from 78 to 84 percent.

Keywords: *Collaborative filtering, project document assessment, recommendation system, assessment score prediction.*

1. Introduction

Project document recommendation is usually done for university students' senior projects. Recommendations on project documents rely on assessment scores given by committees concerned. Criteria for evaluating project documents include: content correctness, format correctness, understanding of the project contents, and completeness. There are many sub issues to be considered under particular criteria. The sub issues depend on contents put in each chapter of the project report. Typically, a computer project document is divided into six chapters: abstract, introduction, literature review, system analysis, system design, and conclusion and discussion. It has occurred quite often that some committee members may overlook or leave out some sub issues in their assessment, resulting in discrepancy of project document quality and evaluation. This certainly affects recommendations of project documents as feedback to the students on the project.

In coping with such discrepancy, the researchers are looking a possible solution, particularly *Collaborative Filtering* as a technique used in recommendation systems. This technique has been used in many areas, such as online shopping, social media, education, to name but the major ones. The key concept of collaborative filtering is user or item similarity calculation (Dou, Yang & Deng, 2016; Xiaoyuan & Taghi, 2009). It consists of two main steps: similarity calculation and prediction. The first step is to find users or items that have high similarity with the user or item of interest as the neighbors. The characteristics or behaviors of the neighbors, such as ratings, comments, likes, and so on will later be evaluated and used for the prediction step.

In this paper, the researchers proposed the Collaborative Filtering technic to predict the missing scores left unevaluated by the assessment team member(s). The experiments were conducted and the accuracy of the used collaborative filtering was measured.

2. Literature Review

Collaborative filtering has been used in various fields of study, such as content similarity in genome data prediction (Ying-Wei, Xin & Yong-Ge, 2012), movie recommendation system (Purnomo & Endah, 2019), and course recommender (Chen, Liu & Shang, 2020). There are two main types of collaborative filtering: User-based Collaborative Filtering (UBCF) and Item-based Collaborative Filtering (IBCF). Both types belong to the memory-based collaborative filtering.

UBCF takes the users with the same rating item as a user set. Later, it predicts the user's rating to another item according to others' rating in the same user set. The key point of the UBCF algorithm is to find the neighbors with the greatest similarities with the interested user. After getting the similarity of the interested user to others, the similar neighbors of interested users according to the similarity being chosen. Finally, the rating of interested users to specific items are predicted using the rating history of similar neighbors and get the recommender results.

IBCF compares the similarity of different items, later predict the rating to a similar item of a user according to its current rating of items. Like the UBCF algorithm, the rating to different items of the same user needs to be collected.

In this research work, the UBCF is selected to predict the missing scores by identifying the neighbors with the greatest similarities with the interested user.

3. Research Objective

The research objective of this study was to apply the collaborative filtering approach to estimate missing scores of computer project document assessment.

4. Research Methodology

Research methodology of this research work consisted of three main parts:

(1) Gathering computer project document assessment scores,

(2) Predicting computer project document assessment missing scores, and

(3) Measuring accuracy of prediction scores.

4.1 Gathering Computer Project Document Assessment Scores

In this research work, computer project documents were assessed by an assessment team. Each document was assessed by five committee members: a project advisor, a course coordinator, and other three specialists. The assessment scores for each document were collected with an assessment form. There are four main assessment issues used on the form: content correctness, format correctness, understanding of the project contents, and completeness. The documents were assessed in six chapters: abstract, introduction of the project contents, literature review, system analysis, system design, followed by conclusion and discussion. Each chapter uses different sub issues for assessment depending on its characteristics as summarized below:

1) Abstract
    a. Content Correctness
        - Sub Issue 1: Conciseness
        - Sub Issue 2: Conveying important points
        - Sub Issue 3: No misleading information
        - Sub Issue 4: No other irrelevant concepts
        - Sub Issue 5: Containing clear research results
        - Sub Issue 6: Key words conveying the project's purpose
    b. Format Correctness
        - Sub Issue 1: Margin
        - Sub Issue 2: Font and size
        - Sub Issue 3: Line spacing
        - Sub Issue 4: Page number
        - Sub Issue 5: Length of contents
        - Sub Issue 6: Length of keywords
    c. Understanding of the project contents
        - Sub Issue 1: Giving an overview of the work
        - Sub Issue 2: No words or sentences considered misleading in the document
        - Sub Issue 3: Summarizing the needs of users
        - Sub Issue 4: Showing ability to understand, learn and expand knowledge from the project
        - Sub Issue 5: Readability of contents
    d. Completeness
        - Sub Issue 1: Showing a structure of introduction, content and summary
        - Sub Issue 2: Reporting objective, methodology, and conclusion
        - Sub Issue 3: Unity and coherence shown in the abstract
        - Sub Issue 4: Showing complete components: title, author, advisor, academic year, contents, and keywords
2) Introduction
    a. Content Correctness
        - Sub Issue 1: Preciseness and conciseness
        - Sub Issue 2: Showing evidence of information and reasons
        - Sub Issue 3: Showing the feasibility of the project
        - Sub Issue 4: Presenting theories and information in support of the project
        - Sub Issue 5: Objectives being consistent with the project title
        - Sub Issue 6: Objectives being measurable and evaluable
        - Sub Issue 7: Project contributions clearly stated
        - Sub Issue 8: Project scope and plan clearly defined

b. Format Correctness
  - Sub Issue 1: Paragraphs properly divided
  - Sub Issue 2: Numbering used in objectives
  - Sub Issue 3: Margins properly set
  - Sub Issue 4: Character font and size properly used
  - Sub Issue 5: Paragraph and numbering properly used
  - Sub Issue 6: Page numbers properly sequenced

c. Understanding
  - Sub Issue 1: Consistency in the project objectives
  - Sub Issue 2: Writing consistent in style with logical organization
  - Sub Issue 3: Clear description of the project

d. Completeness
  - Sub Issue 1: Containing background, reason and need of the project
  - Sub Issue 2: Presenting theoretical concepts, current situations, problems, and the importance of the problem
  - Sub Issue 3: Including the results with yields and benefits.

3) Literature Review

a. Content Correctness
  - Sub Issue 1: Concepts well compiled and summarized
  - Sub Issue 2: Contents of the articles well re-paraphrased
  - Sub Issue 3: No copying of the referenced articles

b. Format Correctness
  - Sub Issue 1: Paragraphs properly divided
  - Sub Issue 2: Numbering properly sequenced
  - Sub Issue 3: Margins properly set
  - Sub Issue 4: Character font and size properly used
  - Sub Issue 5: Paragraph and numbering properly used
  - Sub Issue 6: Page numbers properly sequenced

c. Understanding
  - Sub Issue 1: Contents synthesized according to the studied issues
  - Sub Issue 2: Contents well re-paraphrased
  - Sub Issue 3: Contents consistent with the research project.

d. Completeness
  - Sub Issue 1: Concepts or theories related to research project
  - Sub Issue 2: Research results shown in solving the problem in the research project
  - Sub Issue 3: Giving a theory of relevant knowledge and programs used in the research project
  - Sub Issue 4: Having at least two parts: theories and related works

4) System Analysis

a. Content Correctness
  - Sub Issue 1: Correctness of relationship between Context diagram (DFD0) and Data Flow Diagram level 1 (DFD1)

- Sub Issue 2: Correctness of relationship between data stored in DFD1 and Entity Relationship (ER) diagram
- Sub Issue 3: Correctness of relationship between Entities in ER diagram and Attributes in Data Dictionary
- Sub Issue 4: Tables in database corresponding with ER diagram
- Sub Issue 5: Correctness of DFDs
- Sub Issue 6: Example data in data dictionary from the real data

b. Format Correctness
- Sub Issue 1: Table Format
- Sub Issue 2: Page numbering
- Sub Issue 3: Picture arrangement
- Sub Issue 4: Font
- Sub Issue 5: Margin
- Sub Issue 6: Format of DFD
- Sub Issue 7: Format of ER diagram
- Sub Issue 8: Format of Data Dictionary

c. Understanding
- Sub Issue 1: Diagrams being clear
- Sub Issue 2: Lines in diagrams not overlapped
- Sub Issue 3: Lines in diagrams being straight
- Sub Issue 4: Symbols being used if unconnected with the desired symbols
- Sub Issue 5: Relationships in diagram not ambiguous

d. Completeness
- Sub Issue 1: Completeness of dataflow diagram
- Sub Issue 2: Completeness of Database Design described in ER diagram
- Sub Issue 3: Stating issues of system analysis

5) System Design

a. Content Correctness
- Sub Issue 1: Consistency in user interfaces
- Sub Issue 2: Design properly divided: first middle and last sections
- Sub Issue 3: System designed for all level of users
- Sub Issue 4: Inputs sufficiently designed for the needs
- Sub Issue 5: Outputs/Reports designed for all levels of users
- Sub Issue 6: Software and hardware selected as suitable for the system

b. Format Correctness
- Sub Issue 1: Sequence of pictures
- Sub Issue 2: Margin
- Sub Issue 3: Paragraph and Line spacing
- Sub Issue 4: Picture size
- Sub Issue 5: Font and size

c. Understanding
- Sub Issue 1: Pictures clear and easy to understand
- Sub Issue 2: Order of pictures with a clear sequence
- Sub Issue 3: The design used to develop user interfaces easily
- Sub Issue 4: Clear description of the pictures

d. Completeness
- Sub Issue 1: Completeness of pictures
- Sub Issue 2: Completeness of screen layout of user interfaces
- Sub Issue 3: All software and hardware specified in the system

6) Conclusion and Discussion

a. Content Correctness
- Sub Issue 1: Statistics properly used
- Sub Issue 2: Research results connected to concepts and theories described in Chapter 2
- Sub Issue 3: Conclusion consistent with the objectives
- Sub Issue 4: Containing analysis, synthesis and conclusion of actual research results

b. Format Correctness
- Sub Issue 1: Tables properly used
- Sub Issue 2: Table format
- Sub Issue 3: Paragraph and Line spacing
- Sub Issue 4: Page number
- Sub Issue 5: Margin
- Sub Issue 6: Font and size

c. Understanding
- Sub Issue 1: Research results easy to understand
- Sub Issue 2: Research results showing unity and clarity
- Sub Issue 3: The results separately discussed, issue by issue

d. Completeness
- Sub Issue 1: Complete documentation
- Sub Issue 2: Complete discussion on all issues

Example scores of the abstract are displayed in Table 1. The average scores of the main issues were later computed as examples shown in Table 2. Finally, an average score of all chapters, and the computer project document assessment score were computed. Assessment scores for sub issues were defined as follows:

1) Very Good: Score value of 5. The document achieves 80 percent of quality for the assessment issue.
2) Good: Score value of 4. The document achieves 70 percent of quality for the assessment issue.
3) Fair: Score value of 3. The document achieves 60 percent of quality for the assessment issue.
4) Poor: Score value of 2. The document achieves 50 percent of quality for the assessment issue.

5) Very Poor: Score value of 1. The document achieves less than 50 percent of quality for the assessment issue.

Table 1: Examples of Sub Issue Assessment Scores: Abstract

Sub Issues	Committee Member 1	Committee Member 2	Committee Member 3	Committee Member 4	Committee Member 5
Sub Issue 1	5	4	2	5	4
Sub Issue 2	4	2	5	4	5
Sub Issue 3	5	4	5	5	5
Sub Issue 4	4	4	4	4	5
Sub Issue 5	5	4	5	4	5
Sub Issue 6	4	4	5	4	4

Table 2: Examples of Main Issue Assessment Scores: All Chapters

Issues	Abstract	Introduction	Literature Review	System Analysis	System Design	Conclusion and Discussion
Content Correctness	4.30	2.47	3.84	4.44	3.18	4.21
Format correctness	3.54	4.97	3.85	3.64	4.73	3.51
Understanding	3.01	2.58	4.76	3.99	3.85	4.54
Completeness	4.29	3.88	4.61	2.56	4.04	3.23

The computer project document assessment score of the document in Table 2 is 3.83.

4.3 Measuring Accuracy of Prediction Scores

Sometimes committee members may not assess all sub issues of the project document. The missing scores were estimated using UBCF algorithm. It consists of two main steps:

1) Calculating the similarity scores rated by committees using Pearson correlation-based similarity (Xiaoyuan & Taghi, 2009) as expressed in Equation 1.
2) Predicting the missing score(s) of sub issue(s) using weighted sum as displayed in Equation 2.

$$w_{u,v} = \frac{\sum_{i \in I}(r_{u,i} - \bar{r}_u)(r_{v,i} - \bar{r}_v)}{\sqrt{\sum_{i \in I}(r_{u,i} - \bar{r}_u)^2 \sum_{i \in I}(r_{v,i} - \bar{r}_v)^2}} , \qquad (1)$$

where $w_{u,v}$ similarity between committee u and v

i sub/main issue i rated by both committee members u and v

I	*all* sub/main issues rated by both committee members *u* and *v*
$r_{u,i}$	score of sub/main issue *i* rated by committee member *u*
$r_{v,j}$	score of sub/main issue *i* rated by committee members *v*
$\bar{r}_u$	average score of the co-rated sub/main issues rated by committee member *u*
$\bar{r}_v$	average score of the co-rated sub/main issues rated by committee member *v*

$$P_{u,i} = \frac{\sum_{n \in N} r_{u,n} w_{i,n}}{\sum_{n \in N} |w_{i,n}|}, \qquad (2)$$

where

Pu,i	prediction score of sub/main issue *i* of committee member *u*
u	committee member *u*
i	is a sub/main issue *i*
n	other sub/main issue *n* rated by committee member *u*
N	all other sub/main issue rated by committee member *u*
$r_{u,n}$	score of sub/main issue *n* rated by committee member *u*
$w_{i,n}$	similarity between committee members *u* and other for sub/main issue *n*

Only the similarities ($w_{u,v}$) having value greater than zero are considered because the negative value means the score rated by two committee members are not similar or not correlated with each other.

Table 1 assumes that the sub issue 1 of the committee 1 is missing. The given example shows how to compute the missing score.

$$\bar{r}_1 = \frac{4+5+4+5+4}{5} = 4.4$$

$$\bar{r}_2 = \frac{2+4+4+4+4}{5} = 3.6$$

$$w_{1,2} = \frac{\big((4\text{-}4.4)*(2\text{-}3.6)\big)+\big((5\text{-}4.4)*(4\text{-}3.6)\big)+\big((4\text{-}4.4)*(4\text{-}3.6)\big)+\big((5\text{-}4.4)*(4\text{-}3.6)\big)*\big((4\text{-}4.4)*(4\text{-}3.6)\big)}{\sqrt{\big((4\text{-}4.4)^2+(5\text{-}4.4)^2+(4\text{-}4.4)^2+(5\text{-}4.4)^2+(4\text{-}4.4)^2\big)*\big((2\text{-}3.6)^2+(4\text{-}3.6)^2+(4\text{-}3.6)^2+(4\text{-}3.6)^2+(4\text{-}3.6)^2\big)}}$$

$= 0.8/1.959592$

$= 0.408248$

For similarity scores between committee members 1 and the rest are:

$w_{1,3} = 0.408$

$w_{1,4} = 0.612$

$w_{1,5} = 0.408$

The missing score of sub issue 1 of committee member 1 is later predicted using Equation 2 as follows:

$$P_{1,1} = \frac{(4 * 0.408) + (2 * 0.408) + (5 * 0.612) + \ (4 * 0.408)}{0.408 + 0.408 + 0.612 + 0.408} = 3.89$$

The prediction score is 3.89; the actual score value is 5.

If all scores rated by the committee members (except the missing score) are equal, the $w_{u,v}$ will be equal to zero. In such a case, the missing score is set as well as the others as an example shown in Table 3.

Table 3: Examples of Scores Causing Zero Similarity Value

Sub Issues	**Committee Member 1**	**Committee Member 2**	**Committee Member 3**	**Committee Member 4**	**Committee Member 5**
Sub Issue 1	5	5	4	2	4
Sub Issue 2	4	4	4	2	5
Sub Issue 3	4	4		3	2
Sub Issue 4	5	4	4	4	3
Sub Issue 5	4	4	4	2	3
Sub Issue 6	5	5	4	4	2

$$\bar{r}_3 = \frac{4+4+4+4+4}{5} = 4$$

$$\bar{r}_1 = \frac{5+4+5+4+5}{5} = 4.6$$

$$w_{3,1} = \frac{\left((4\text{-}4)*(5\text{-}4.6)\right)+\left((4\text{-}4)*(4\text{-}4.6)\right)+\left((4\text{-}4)*(5\text{-}4.6)\right)+\left((4\text{-}4)*(4\text{-}4.6)\right)*\left((4\text{-}4)*(5\text{-}4.6)\right)}{\sqrt{\left((4\text{-}4)^2+(4\text{-}4)^2+(4\text{-}4)^2+(4\text{-}4)^2+(4\text{-}4)^2\right)*\left((5\text{-}4.6)^2+(4\text{-}4.6)^2+(5\text{-}4.6)^2+(4\text{-}4.6)^2+(5\text{-}4.6)^2\right)}} = 0$$

In this case, the missing score in Table 3 was set to 4.

If a committee member does not rate all sub issues of a main issue. The average scores of all sub issues of that main issues are used. The average scores of neighbors or other committee members are used in the collaborative filtering shown as examples in Table 4.

Table 4: Examples of Missing Scores of All Sub Issues of Content Correctness in Introduction

Issues	**Content Correctness**					**Format Correct-ness**	**Under-standing**	**Com-pleteness**
	C1	**C2**	**C3**	**C4**	**C5**	...	...	...
Abstract	3.77	3.52	4.93	3.08	3.71	...	...	...
Introduction	3.64		3.70	3.79	4.26	...	...	...

Issues	**Content Correctness**					**Format Correct-ness**	**Under-standing**	**Com-pleteness**
	C1	**C2**	**C3**	**C4**	**C5**			
Literature Review	3.77	4.18	4.61	4.51	4.70	...	...	...
System Analysis	3.76	3.88	4.09	3.50	4.65	...	...	...
System Design	3.86	3.98	4.19	3.42	4.20	...	...	...
Conclusion and Discussion	3.37	4.41	3.07	4.11	3.19	...	...	...

Note: C1, … C5 refer to Committee Member 1, … Committee Member 5.

In Table 4, the similarities computed by Equation 1 are:

$w_{2,1}$ = -0.649102303
$w_{2,3}$ = -0.772721764
$w_{2,4}$ = 0.835633748
$w_{2,5}$ = -0.17040505

The missing score of Committee Member 2 for the introduction chapter calculated by Equation 2 is:

$$P_{1,1} = \frac{(3.79 * 0.84)}{0.84} = 3.79$$

4.2 Predicting Computer Project Document Assessment Missing Scores

The accuracy of the prediction scores were measured by two equations: Equation 3 and Equation 4. Mean Absolute Percentage Error (MAPE) (Stephanie, 2017) is used in Equation 3 for measuring percent error, and percent accuracy is used in Equation 4.

$$M = \frac{100}{n} \sum_{t=1}^{n} \frac{|A_t - F_t|}{At}, \quad (3)$$

where M a mean absolute percentage error
A_t an actual score value
Ft a prediction score value
n number of prediction score values

$$\text{Accuracy} = 100 - M \quad (4)$$

The prediction value of Sub Issue 1 of Committee Member 1 in Table 1 is 3.89, and the actual value is 5. The number of missing values (n) for this case is 1. The accuracy is computed as follows:

$$M = 100 * \left(\frac{|3.89-5|}{5}\right) = 22.2$$

Accuracy = 100 – 22.2 = 77.8%

5. Experimental Setup and Experimental Results

The assessment form was produced by Google form. There were 20 computer project documents assessed by the committee. There were 5 committee members assessing each document. The scores after rating by the committee members were divided into two groups:

1) Scores at the sub issue level: Each data set looks like Table 1. The assessment scores of sub issues of these data sets were removed in values 1 to 5 randomly. There were 80 data sets generated for this level.
2) Scores at the main issue level: For each data set, average scores of each main issue for each committee member were calculated. Each data set looks like Table 4. The average assessment scores of main issues of these data sets were also removed in values 1 to 5 randomly. There were 80 data sets generated for this level.

The missing scores were predicted and their accuracies were computed. The experimental results are displayed in Table 5 and 6.

Table 5: Experimental Results of Sub Issue Data Sets

Number of Removed	*M*	Accuracy
1	22.10	77.90
2	21.87	78.13
3	21.78	78.22
4	21.74	78.26
5	21.77	78.23
Average	21.85	78.15

Table 6: Experimental Results of Main Issue Data Sets

Number of Removed	*M*	Accuracy
1	15.63	84.37
2	15.75	84.25
3	18.07	81.93
4	15.21	84.79
5	15.09	84.91
Average	15.95	84.05

6. Conclusion and Discussion

The collaborative filtering approach was applied to predict missing scores of computer project document assessment. The Google form was used to gather assessment scores from committee members. The assessment scores rated by committee members were divided into two groups: assessment scores at the sub issue level and assessment scores at the main issue level. The experiment data were set by removing assessment scores of these two groups in values 1 to 5 randomly. There were 80 data sets for each group. Missing scores or removed scores of these experiment data were predicted. The experimental results revealed that the accuracy of the data at the sub issue level and the main issue level were 78 percent and 84 percent in average, respectively.

The assessment scores at the main issue level are from an average of all sub issues under a particular main issue. Therefore, the assessment scores at the main issue level do not cause much fluctuation. As reported in this study, the results in accuracy of predictive scores at the main issue level appeared better than those at the sub issue level. The obtained findings suggest that it should be possible, in addition to quality assessment, to apply the collaborative filtering approach to predict a set of products and services for users who have the same rating behaviors in business contexts as seen fit by decision-makers concerned.

7. The Authors

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Teamwork in Service Industry Organizations

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Abstract

This academic paper deals with teamwork in service industry organizations. For efficiency of organizations, it is vitally important to build teams to work on assigned tasks in coordination. The author therefore used a qualitative approach with analysis, synthesis and literature review to study teamwork regarding adjustments of organizations and determining factors for success in team work. The study findings pointed to two areas for consideration: personnel adjustments and determining factors for efficiency in teamwork. As known, intense business competition in the service industry has prompted organizations to adjust themselves by using teamwork for change in internal management. Through teamwork, all personnel need to adjust themselves by bringing out their competencies to work together, adapt themselves to the new work environment, handle conflicts within the organization, and develop positive attitude toward the team leader and other team members. They are made aware of the fact that teamwork could be an alternative for outsourced staff. That is the reason why the current staff has no option but pull together their skills and expertise to work toward the organization's common goal. It was found that determining factors for success in team work were (1) skilled and experienced workers, (2) team leader with good leadership, and (3) team members who value teamwork as an incentive to survive through business competition in the service industry.

Key words: *Teamwork, service industry organizations, team efficiency, trust in supervisors, participation*

1. Rationale of the Paper

This academic paper intends to show why teamwork is urgently needed in the service industry organizations in Thailand. Intensive business competition has spurred the need of organizations to develop their personnel to do teamwork. Working alone is not possible because the work process is too complex to handle; it requires a pool of skilled workers with a good leader to work together toward the goal set by the organization. In this paper, the author reviewed studies on teamwork done by Thai researchers to secure information on adjustments made regarding the adoption of teamwork and determining factors for success in teamwork. Then the author looked at major theories related to teamwork and summarized major concepts in a diagram with explanation of each. In relating the literature and the selected theorists' concepts, the author collected additional information from interviewing ten team leaders in organizations in the service industry located in the central and the eastern parts of Thailand. This was to reach a convincing conclusion on the major issues of concern in Thailand's service industry regarding personnel adjustments and determining factors for success in teamwork as experienced by team leaders in the service industry.

2. Studies on Teamwork in Thailand

There are quite a few studies in teamwork in organizations in Thailand. The author selected ten to look at the issues of adjustments to teamwork and determining factors for success in teamwork as shown in this section.

The hotel business is highly competitive in providing services. Human resource management is therefore has its task on bringing personnel to work together toward the organizational goal (Piceshsiraprapa, 2016). Due to intensive business competition, the environment is changing rapidly, affecting many organizations, especially key personnel in their work (Rukhun, 2014); (Promsuwan & Fongnam, 2014; Sivapitak, 2015). The economic, social, and economic aspects of business need to be developed along with advancements in the economic competitiveness. The flow of changes also reflects the need for organizations to *adjust the management mode* that requires a wide range of knowledgeable and experienced personnel to be effective (Tridej et al., 2014). Therefore, the organization wants all personnel to collaborate effectively to drive the organization to reach its goal with good teamwork ((Sawetsomboon et al., 2007; Kongsueb, 2017). Therefore, the performance of the operations staff depends on their ability and skills to work together to provide good service and effective team collaboration (Makkaew, 2015).

Working in an organization requires working with other people; working alone cannot help much because the task is too complex for a person to handle. Workers need to understand the process or how to *adapt to the changing environment* and the demands for collaboration with others. If the management practice does not change with the situations or threats, it can cause limitations in the target outcomes in that organization (Promsuwan & Fongnam, 2014). Particularly, some staff with negative attitudes toward teamwork may delay the work process with insufficient collaboration. In this regard, *positive attitude* and coordination are the keys to save human resource and operating time. Low speed at work means lagging behind in business competition. Certainly, organizations need skilled workers with prior work experience and ability to work under pressure and *cope with conflicts*. As a result, talented personnel from other organizations may be outsourced to speed up the work process toward the target outcome. This often results in a change of job and the resignation of the existing staff. The higher the personnel turnover, the greater the dissatisfaction of the workforce, and this has impacts on the quality of service. To move to a better organization, human resource management may require hiring qualified people will also require a high budget in so doing (Rukhun, 2014). Competition within the organization, conflicts, lack of unity and teamwork will affect the organization in not having the right man on the right job with supporting teams, resulting in low efficiency at work. This will definitely affect the target results the organization has planned for (Picheshsiraprapa, 2016; Kongsueb, 2017).

The staff's attitude toward teamwork has become a major concern among managers. This has impacts on employees and organizations now and in the future because the work of the personnel in the organization requires judgment, experience and specific *good skills* from *experienced* workers to team up collaboratively for efficiency (Sawetsomboon et al, 2007); Makkaew, 2015; Upakarnkun & Kaewka , 2016). The team needs *good leadership* and skilled workers. The team leader needs to build trust in the team members and vice versa. *Trust in leadership* and motivation can help create a sense of commitment to work and loyalty as a bond to the organization (Sivapitak, 2015; Kaewkangwan & Kwanruen, 2018).

The author has so far looked at the research results reported in various articles; some researchers identified the problems arising in teamwork. There may be conflicts involved in individual decisions, actions, and personal characteristics. To understand clearly the role and function of teamwork in an organization, the author has also considered well-known theories related to teamwork: Robbins' theory of expectation, McGreger's XY theory of organizational engagement, Allen & Mayer's personnel theory, Mclean's theory of quest for needs, and Baker's theory of changing leadership attributes.

As reported earlier, personnel working as a team in the organization must have a positive attitude toward the organization and themselves. They need to bring in their knowledge, relevant skills and competencies and experience to achieve maximum efficiency. Working together enables individuals to pool a wide range of skills and work experience to reach the common goals set by the organization effectively.

3. Review on Theorists' Concepts Related to Teamwork

This section reviews theorists' concepts related to teamwork so that readers can see how these concepts are related to the findings of the studies reported in Section 2.

Baker & Mahmood's Literary Prism Theory (1973) is about transformational leadership. This is the type of leader who is willing to change for adjustments needed for the new context or movement.

Haider's behavioral identification theory (1990) says that acknowledging or acting on something with their own needs is easier to work with, but it becomes harder to work when the environment is a deterrent.

Maslow's motive theory (2019) says that humans have endless demands. Once you've done something you want, there's another need to replace it.

Cairns (1996) supported Blenchard's leadership theory on two types of leaders: those who assign roles and tasks to followers, and those who focus on relationship and allow followers to think or work independently. For the second type, relationship means social support.

Bandura's cognitive theory (1986) states that the intellectual behavior, personal traits, and influence of the environment determine changes in an individual's behavior.

Robbins' theory of expectation (1982) consists of three assumptions: that human behavior is determined by the sum of impetus from within oneself and the external environment; that each human has different needs and goals; and when people decide to behave in a way, they tend to expect the value of the results after the behavior has been done.

McGreger's XY theory (1966). Theory X is the lazy type who needs control to work; and Theory Y is the diligent type who is willing to work by oneself and there is no need for the supervisor to control.

Allen & Mayer's theory of corporate engagement (2004) is divided into three ways: (1) Concept of attitude, (2) Behavioral concepts concerning the consistency of behavior and continuity of work, and (3) Concepts related to the accuracy or norms of society. These three concepts of corporate commitment focus on corporate engagement or organizational loyalty. It is the relationship between employees within the organization and with the organization. If the employee has a strong commitment or loyalty to the organization, the less likely that employees will leave their workplace.

Mclean's theory of needs (2001) is divided into three categories: (1) Need for Achievement, (2) Need for Power, and (3) Need for Affiliation.

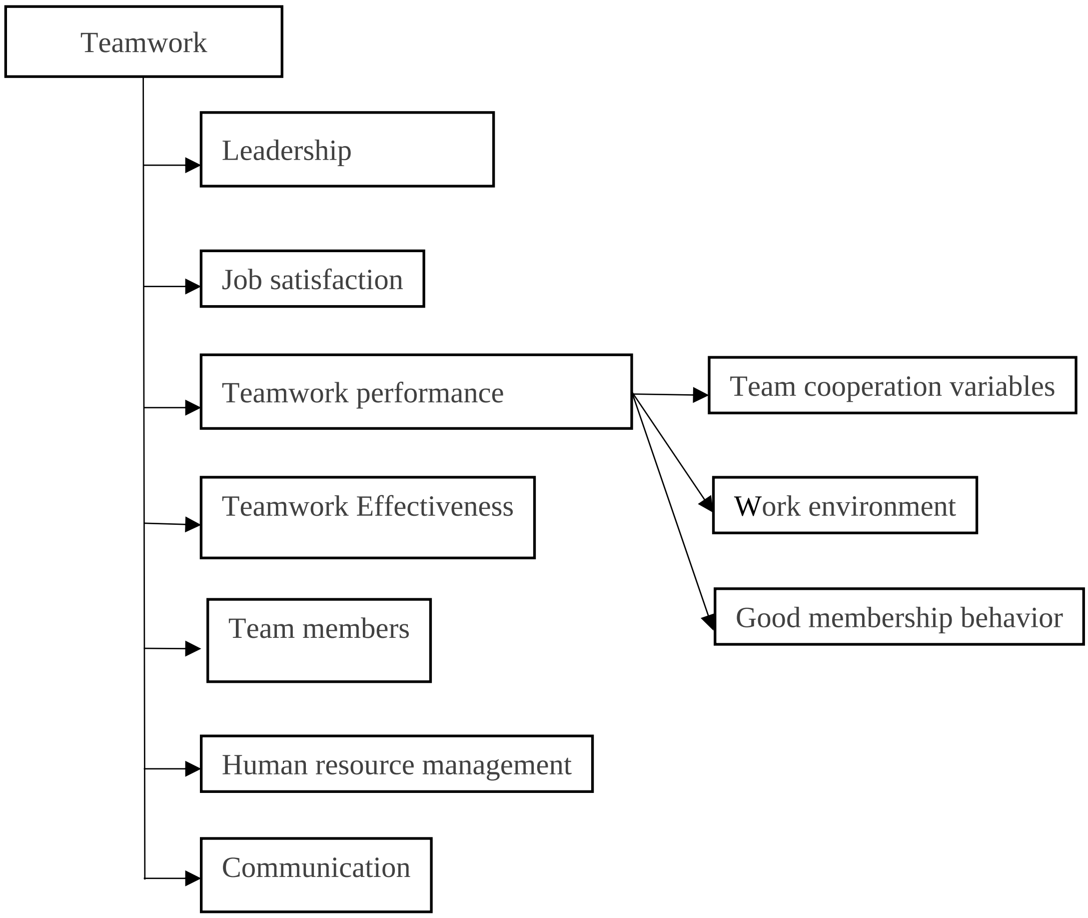
Hernon & Rossiter (2007) supported Blake & Mounton's theory that states: the form of teamwork is one that focuses on work efficiency with moral support for subordinates. Employees are to act in a relevant manner and in the same direction. Cooperation from employees within the organization is vitally important in that teamwork can gather quality employees in the organization to work toward the identified goal which one person cannot achieve. Work assignments according to abilities of individuals enable team members to learn from others and in turn recognize and accept each other.

Fiedler (1967) proposed that performance is the success of the group's operations by getting everyone involved in the operation to achieve their goals. Focus is on the quality of work and speed.

4. The Diagram of Selected Theorists' Concepts and Explanation

From the theorists' concepts in Section 3, the author then developed a diagram of selected concepts to be applied to team work. Such concepts will be used as guiding points to collect information from team leaders in the service industry, to be reported in Sections 5 and 6.

Figure 1: Selected Theorists' Concepts as Applied to Teamwork



Teamwork

The concept of teamwork as given by Hernon and Rossiter (2007) supported Blake & Mounton's theory which focuses on work efficiency, morale of work, cooperation from employees within the organization, gathering of quality employees to share expertise and skills, and peer recognition.

Gathering people with different abilities or skills to help and fill what is missing in each other is required in good teamwork. Team members then work toward the same goal while bringing out the full potential each, resulting in achieving the same goal effectively (Saritvanich, 2006).

Leadership

The nature of leadership affects the performance of employees. A leadership style that focuses on work in the middle line and as a team has a positive relationship with job success. People-oriented leadership has a negative impact on job success.

Job satisfaction

How a person feels about his/ her work performance affects job satisfaction. It is important to involve employees in the assigned work and motivate them to strive to achieve their goals. There are a number of factors concerned, particularly participation in work and decision-making that can create job satisfaction. Work satisfaction accounts as a major part of the organization's success.

Teamwork Performance

As proposed by Fiedler (1967), performance is the success of the group's operations by getting everyone involved in the operations to achieve the goal. It is measured by workload with good quality done in the assigned working period. The quality of work and speed are expected as results of the executed operations

A good teamwork environment will enable employees to work efficiently. This requires sufficient support facilities and reasonable space in a friendly atmosphere.

Teamwork effectiveness

According to Robbins (1982), the ability to work as a team to achieve the goals set by the organization is based on powerful team attributes as follows:

(1) Having a clear goal
(2) Skills consistent with the job responsibilities, including personal attributes necessary for work.
(3) Trust with each other
(4) Commitment to the same thing
(5) Exchange of ideas.
(6) Negotiating skills by applying knowledge and persuasion skills. This makes it flexible and adaptable to the situations that need to be faced at any time.
(7) Proper leadership to complete the task as needed by guiding and helping the team to accomplish its goals.
(8) Providing internal and external support, incentive support, good working environment, additional training, reward or welfare.

Team Members

Team collaboration for effective teamwork contains the following variables:

(1) Determination for success shared by all team members regarding objective,

policy and goal.

(2) Leaders with appropriate attributes, such as sincere recognition, leadership and neutrality.

(3) Team members have appropriate attributes: responsibility for their own duties and groups, as well as good listeners and commentators.

(4) Good interaction among members.

(5) Collaboration in every step in planning, paying attention to data, collaborating and communicating well.

(6) Teamwork empowered by participation and allowing employees at all levels to participate in management under their authority, using Deming's cycle of *Plan, Do, Check, Act.*

(7) Good teamwork environment.

Human Resource Management

Organizations need to have a clear-cut policy of human resource management known to all employees. Human resource managers are to work on career paths of individual employees to ensure that they grow with the organization, and that teamwork forms a major part in work life within.

Communication

Undoubtedly, teamwork requires good communication among team members. It is a must that the outcome of the assigned task be spelled out in concrete duties individuals have to perform and update each other by effective channels of communication agreed upon by all team members. Communication gaps or breakdowns, if any, must be remedied without delay.

5. Collection of Information from Personnel in the Service Industry

In relating the literature and the selected theorists' concepts, the author collected additional information from interviewing ten team leaders in the service industry located in the central and the eastern parts of Thailand. This was to obtain information by interview about the key concepts as shown in Figure 1. The author looked for consistency, if any, in their views on personnel adjustments and determining factors for success in teamwork as experienced by team leaders in the service industry.

The author asked ten team leaders three holistic questions on (1) teamwork in their organization, (2) the building path to teamwork and its coordination, and (3) teamwork efficiency. Then the author probed into their perception of the concepts shown in Figure 1 on (1) teamwork, (2) leadership, (3) job satisfaction, (4) teamwork performance, (5) teamwork effectiveness, (6) team members, (7) human resource management, and (8) communication.

6. Information from Personnel in the Service Industry

Ten team leaders, five each from the service industry in the central and eastern parts of Thailand, were interviewed on the points as described in Section 5. They were given the scope of questions and responded as they considered possible to volunteer information to the author. Their responses were recorded as well as noted by the author. This section will report viewpoints of high frequency at 80% or above to show representativeness of obtained information as shown below.

(1) There has been now intense competition in the service industry. This causes each organization to *adjust their management* by pooling *expertise and skills* to *work together in teams*. Employees within the organization must have good working abilities and skills to work together effectively. Working alone as in the past is no longer possible because the work process is too complex to achieve the goal or target outcome—either in short or long terms.

(2) Such a change in using teamwork has brought some *conflicts* within, for the existing staff tended to prefer their own working styles. Those who refuse to adapt or have negative *attitudes toward teamwork* often cause delays in operations and result in inefficiency. This inevitably affects competitiveness of the organization.

(3) Team building is needed and requires *cooperation* from all staff members. The organization has provided teamwork workshops and activities to help employees adapt and develop themselves into *members of teams* for good performance and effectiveness.

(4) The organization is well aware of employees' *job satisfaction* that it affects performance and effectiveness as team members. Team leaders have a vital role in creating *trust*, *satisfaction and feeling of support* for team members. In this regard, team leaders have been made aware of their significant role in *communicating tactfully* with followers.

(5) The *human resource management* in the organization has explicated the clear-cut policy and team-based work procedure to all employees. Their individual career paths, expected work performance, and performance appraisal criteria are made known to those concerned to avoid misunderstanding or misinterpretation that could lead to undesirable turnover.

(6) In coping with the increasingly intense business competition, the organization *needs skilled and experienced workers*, and tends to look for *talents from other organizations*, causing those existing staff members with required experience to lose their jobs. This also has impact on the organization's policy on staff recruitment, and also on *team leaders* who are not able to maintain their team members.

From the information volunteered from ten team leaders in the service industry, we can see that their responses pointed to the issues of concern in Figure 1, personnel adjustments to teamwork and determining factors for success in teamwork, as reported earlier in Section 2.

The obtained information from ten leaders was consistent with the topic of concern over teamwork in the service/ hospitality industry organization. It is without doubt that teamwork relies on a number of factors, namely the relationships between team leader and team members, communication within the organization, support from the human resource management policy and work procedure, trust in the supervisor or team leader, and relationship models and organizational engagement.

Good hospitality job abilities and skills are always in great demand. However, for organizations to keep their existing talents in teams, they need to work on leadership, teamwork attributes, and staff involvement through tactful processes of motivation and good corporate culture. As known, transformational leadership is required to sustain entrepreneurship traits for productivity and effective teamwork within service industry organizations.

7. Conclusion

The author showed in this paper that studies in teamwork by Thai researchers pointed to personnel adjustments and determining factors for success in teamwork practiced in the service industry. Their findings are related to teamwork based on theoretical concepts as shown in Sections 3 and 4, and Figure 1 which was supported by interview information from ten team leaders in the service industry in Thailand.

In relating the literature and the selected theorists' concepts, the author collected additional information from interviewing some service industry personnel located in the central and the eastern parts of Thailand. This was to reach a convincing conclusion on the major issues of concern in Thailand's service industry regarding personnel adjustments and determining factors for success in teamwork as experienced by them in the service industry. Through teamwork, personnel adjustments prompt personnel to bring out their skills and competencies to work together, adapt themselves, handle conflicts, and develop positive attitude toward teamwork and team leadership. To remain in the workforce, current employees need to pull together their skills and expertise to work toward the organization's assigned tasks and common goal. As for what determines success in team work, those factors were skilled and experienced employees, good leadership, and good team membership. As such, teamwork has therefore served as solution for organizations to stay competitive in productivity and attained goals in the service industry.

8. The Author

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Sharing Professional Viewpoint:
The Role of AI Technology in Changing Tourism Lifestyle

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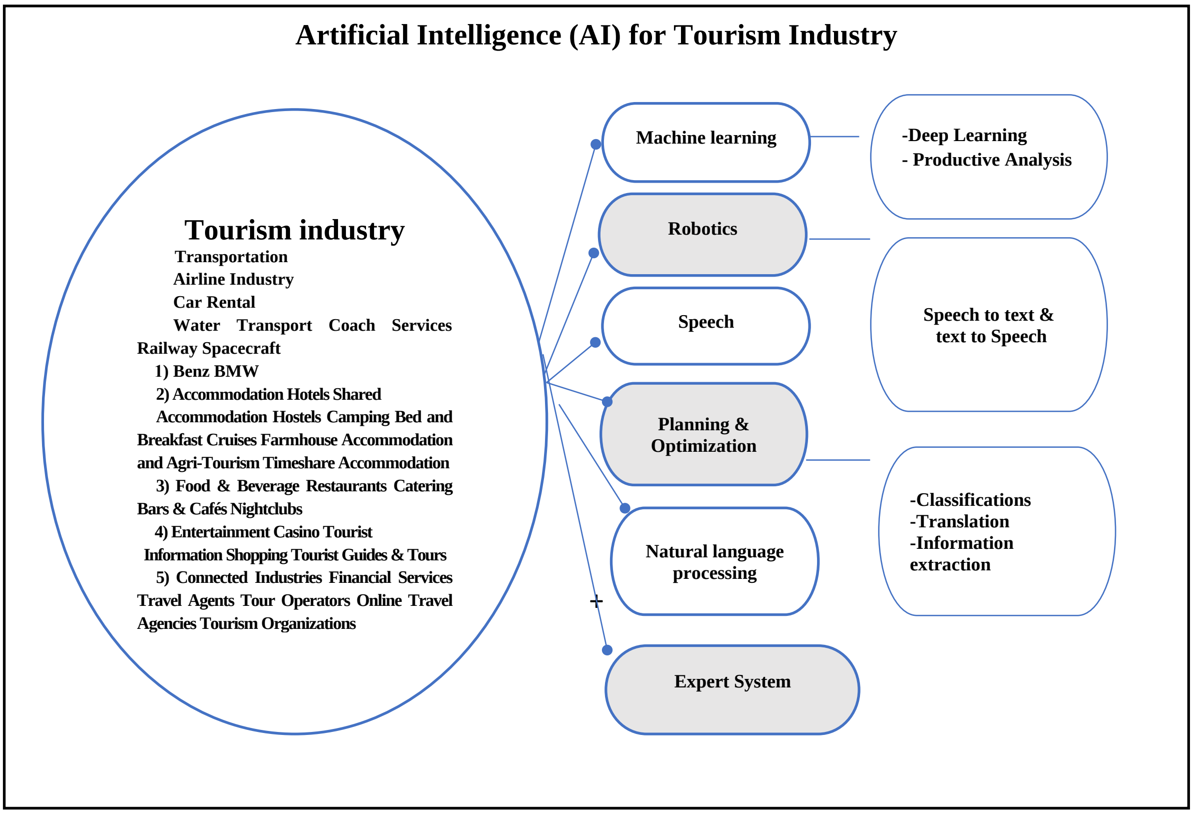
1. Introduction

The world is moving toward the digital trend. The Internet of things has been changing rapidly and bringing about innovations and edge technologies that involve our lives and lifestyles from waking up until going to bed. When technology is connected to human lifestyles, tourism operators in Thailand have felt the need to adjust their business operations and marketing along the bright path of 5G high-speed internet and applications to changes in the way clients travel. When tourists' behavior changes to become part of the cyber world, these travel enthusiasts can use communication technology to find information and plan their trips in advance. The Internet has become a vital tool for modern travelers. The Internet has also brought new business opportunities for entrepreneurs to adapt themselves quickly and take advantage of new technologies to satisfy tourists' transformed lifestyles.

2. Artificial Intelligence (AI)

Artificial Intelligence (AI) is generally known as a set of programs or code commands fabricated to work quickly with large memory. The development of AI comes from Narrow AI to General AI systems, like Siri used by Apple, Alexa by Amazon, and Self-Driving or Parking by Tesla.

Figure 1: Artificial Intelligence (AI) for Tourism Industry



As shown in Figure 1, artificial intelligence is widely used in the tourism and hospitality industry. Artificial intelligence has machine learning and the most easily developed machine intelligence.

3. Technology Changing Tourism Lifestyle

Machine Learning is the ability to learn and analyze computer data. To forecast results, the sub-techniques are used: Supervised, Unsupervised, Semi-supervised and Reinforcement. There are different learning algorithms in information required to be learned and the purpose of its use in the hotel business, for example machine learning helps companies find needed information. Many new innovations, such as chat robots, image recognition, predictive analysis in the system itself, reveal the replacement of the power of human management. Tourists have many different preferences that business operators know and can respond to them. Machine learning is now helpful for statistical analysis.

Robotics can help service guests in the hotel's lobby area, as at Marriott Hotels. When guests arrive, they will provide information about the hotel. The robot Mario speaks 19 languages and can also serve meals, sing and dance with the hotel guests (*Thai Magazine Hotel & Travel Magazine*, December 2019-January 2020).

Speech in AI refers to the use of voice commands in travel. AI has the ability to recognize words in human language structures and data analysis of sounds. It is necessary in the tourism and hospitality industry, such as hotels and airlines in trip bookings by customers through Expedia website. Customers can use Chat to do basic inquiries, such as refunds and cancellations by voice command for a prompt response. Responding to customers' needs must be at a high speed. While tens of thousands of others are booking at the same time and may have questions, common or repeated answers entered on the system can help via Voice Assistance.

Automated Planning, Scheduling & Optimization allow machines to make decisions and automate actions to effectively achieve goals, such as managing orders or customers' reservations. Automation starts from procurement, manufacturing, moving, transportation, storage to distribution and sales with flexibility.

Natural Language Processing is done via the NLP application to today's tourism and hospitality industry--contributing to various innovations. Both directly and indirectly, the processing is to bridge the gap in human-computer communication. This can support both reading and listening by using other technologies, such as Visual Recognition for reading text and using Voice Recognition for listening. Chatbot can interact with hotels for accommodation or meal reservations or activities. It is close to answering human questions and customers can optimize Search Engine NLP for quick hotel reservations. In addition, the use of full sentence translation technology is now being developed to respond to one language being translated into another. Currently, the system automatically translates whole sentences on the website; therefore, there is no need for travelers to worry when going abroad.

Expert System in the tourism industry can introduce tourist attractions in places of visit and provide information services to tourists with the use of GPS to identify the position or coordinate via the system in translating languages. In supporting foreign tourists, the system can provide services needed by tourists (Samala et al., 2020). The expert system certainly enhances tourism experiential services, though currently not being able to surpass human services. It serves as an effective complementary dimension of the future tourism.

With the emergence of travel artificial intelligence, it is convenient to make travel arrangements. AI offers travel services that are automated, customized and effectively executed. AI also allows travelers to learn about their behaviors, interests, preferences and personalized experience. Gone are the days of consulting a travel agent, meeting him physically and indulging in an endless chain of phone calls to inquire about travel arrangements. Practical implications for tourism marketing are strategies to enhance the tourists' overall experience with the application of AI and Robotics. New emerging technologies like Chatbots, Virtual Reality, and Language Translators can be effectively utilized in the travel, tourism and hospitality industry regarding selecting tourist routes (Kazak et al., 2020). The potential of artificial intelligence (AI) technologies in the tourism industry apparently exceeds the capabilities of traditional search engines. Some travel services have already begun to use elements of artificial intelligence to analyze large volumes of data and learn from their own and other people's experience in fulfilling customers' needs, routings and reservations. Currently, the main goal for travel tends to "learn" using personalized customer experience. Personalized services most suitable for a particular client show a strong competitive advantage of a business operator. Indeed, it is AI that helps choose needed services and makes processing of large data possible in creating personalized products much faster than traditional search technologies.

4. Final Point

The author showed in this brief writing the role of AI technology in changing travel lifestyle. AI can help assess consumers' behavior and access their purchase history. Such information is vitally important for tourism/ hospitality business operators to use accurate data to sell relevant service products to target customers. Undoubtedly, AI has a strong hold on the tourism and hospitality industry due to its capabilities to reduce time and costs while increasing income. It is therefore a must for service business operators and personnel to understand the current trend and apply AI concepts and principles in full support of their operations and networks concerned.

5. The Author

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3. For Authors

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3.1 Paper and Page Setup:

Paper size: Standard A4

Top margin: 1 inch	Bottom margin: 1 inch
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3.2.6 In-text Citations: Authors are to give references to all the information obtained from books, papers in journals, websites, or other sources. The Author-Date System should be used to cite references within the paper by using the author's last name and date (year), separated by a comma in parentheses; for example, name(s), year.

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3.2.7.1 Tables: The large-sized table format should not be split into two columns but small-sized table can be fit into the column. Each table must be titled, numbered consecutively and complete with heading (title with a description that goes above the table). The word "**Tables**," including number should be typed using Times New Roman 11 points and bold, left-hand justified, and follow by regular 11 points Times New Roman for the heading.

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3.2.10 Reference Lists: The final page contains a list of resources cited in the paper. The style of citations used in RJCM should conform to the American Psychological Association (APA). It is the author's responsibility to ensure the accuracy of all references cited in the paper. References should be listed in alphabetical order using regular Times New Roman 11 points.

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Trongratsameethong, A. & Woodtikarn, P. (2019). Thai QBE for Ad Hoc Query. *Journal of Technology and Innovation in Tertiary Education, 2019, 2*(2), 1-24. doi 10.14456/jti.2019.7

Letter
Format:
Author.//(Year of publication).//Title of Letter (letter).//*Journal Title,/Year (Volume if any),*//Page number.
Example:
Enzensberger, W. & Fisher, P.A. (1996). Metronome in Parkinson's disease (letter). *Lancet, 1996, 347,* 1337.

Unpublished/In press Article
Format:
Author.//(In press Year).//Article Title.//*Journal Title./*(in press).
Example:
Veena, B. (2004). Economic pursuits and strategies of survival among Damor of Rajasthan. *J Hum Ecol*. (in press).

Websites
Format:
Author.//Title.//(Online).//the full address of the web page, accessed date.
Example:
Charlotte, B. Quotes about Action Learning. (Online). http://www.goodreads.com/quotes/tag/action-learning, January 18, 2017.

3.4 Manuscripts of Brief Professional Viewpoints for Sharing

The length of Brief Professional Viewpoints for Sharing is about 8-10 typed A4 pages. Its content should be arranged as follows: **title**, **name of the author, name and address of the institution**, **3-5 keywords**, **body text**, **the author's biography** of 50-80 words, and **references**. The format, font, and font size used in each section correspond to those in the section of **3.2. Manuscripts of Original Article**.

3.5 Reprints

During the first two years of publication (2020-2021), authors will receive one free copy of the journal.

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The length of the unformatted manuscript in WORD can be 15-25 pages in length including references. The contents of the manuscript should include (1) a title with the author's name, affiliate, email address and telephone contact, (2) an abstract of 150 words with 3-5 keywords, (3) an introduction, (4) a rationale and background of the study, (5) research objectives, (6) research methodology, (7) data collection procedure, (8) data analysis, (9) results and discussion, (10) research limitation (if any), (11) conclusion, (12) the author's biography of about 50-80 words, (13) acknowledgement(s) (if any), (14) references, and (15) an appendix or appendices (if any).

All interested readers and paper contributors please contact Editor-in-Chief: Ruja Pholsward, Ph.D., Associate Professor, Rattanakosin International College of Creative Entrepreneurship (RICE), Rajamangala University of Technology Rattanakosin (RMUTR) <rujajinda@gmail.com>, <ruja.pho@rmutr.ac.th>. Please check *RJCM* Publication Policy as guidelines to paper submission. Website submission will be advised after the first editorial screening.

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