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The role of problem identification and intellectual capital in the management of hotels' competitive advantage-an integrated framework

Yong-Quan Li^a, Chih-Hsing Sam Liu^{b,*}^a Research Center of Tourism and Hospitality Management, College of Tourism, Huaqiao University, Quanzhou, Fujian, 362021, P.R. China^b Ming Chuan University, Leisure & Recreation Administration Department, 5 De Ming Rd., Gui Shan District, Taoyuan County 333, Taiwan

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ABSTRACT

Although the effects of intellectual capital on an organization's competitive advantage are well documented, the mechanisms that explain those effects remain unclear. We propose that intellectual capital is associated with the way problems are identified, which is concerned with enhancing competitive advantage. The results of our study support a structural model whereby the indirect effects of intellectual capital on a hotel's competitive advantage are determined through the mechanisms of problem identification. Additional analyses reveal that customer capital is related to structural capital, which predicts the hotel's human capital. Furthermore, the process-oriented view indicates that innovative ability mediates the effects of ability capital on competitive performance.

1. Introduction

The combination of global trends and a highly competitive business environment has led to the increased importance of creating and maintaining a competitive advantage in the tourism and hospitality industry (Casanueva et al., 2015; Liu and Gan, 2015; Molina-Azorín et al., 2015; Preble et al., 2000). To cope with the dynamic environment and changing customer needs, hospitality organizations must be able to identify and exploit both their internal and external capital and to strengthen their capabilities (Paek et al., 2015). Intellectual capital refers to value of the firm's knowledge base and service capabilities, which is the most efficient, albeit challenging, vehicle for internalizing organizational competency, and is a critical attribute of factors that drive hotel profitability and performance (Enz et al., 2006a,b). However, to date, few studies have addressed the role of intellectual capital in the context of competitive advantage and performance within the hospitality industry setting (Enz et al., 2006a,b; Rudež and Mihalič, 2007).

In addition, due to the increasing importance of creating and sustaining a competitive advantage, prior hospitality studies have focused on empirical examinations of the effects of intellectual capital on social network analyses (Hu and Racherla, 2008), knowledge management (Hallin and Marnburg, 2008) and financial performance (Enz et al., 2006a,b; Rudež and Mihalič, 2007). Considerably less literature has addressed intellectual capital as the process by which competitive advantage is achieved (Chen, 2008). Along with a lesser focus on competitive advantage process engagement, the research on intellectual

capital has tended to focus almost exclusively on the different constructs of competitive advantage requirements rather than on the financial performance and overall performance. This narrow stance has thus given rise to the question of how the competitive advantage process engagement interfaces with the broader considerations that tend to be part of an organization's environmental attributes, which include strong intellectual capital components. Drawing on the intellectual capital theory, we further develop this perspective by arguing that intellectual capital is most beneficial to competitive advantage when such engagement is associated with its own problem identification capability.

The current study fills gaps in the hospitality literature by developing an integrated process to analyze how hotels may create competitive advantages through text analytics. It allows the resource allocators or policy makers within a focal hotel to identify the critical attribute of intellectual capital and to better understand the internal and external atmosphere of the focal hotel and the industrial environment. More importantly, we make several other contributions. First, this study demonstrates how the hotel organizations leverage their intellectual capital with the customers and employees and thereby increase their own organizational capability for problem identification in order to outperform their competitors. Second, competitive advantage creation is a process that requires the commitment of internal and external resources to enhance (1) *power*, the ability to counteract the threats of, and create an advantage over, other competitors (Ashford et al., 1989); (2) *innovative ability*, the ability to create new methods of production, enlarge the range of products and services, and introduce

* Corresponding author.

E-mail addresses: Lyqax@hqu.edu.cn (Y.-Q. Li), chihliu@mail.mcu.edu.tw (C.-H.S. Liu).<https://doi.org/10.1016/j.ijhm.2018.05.022>Received 14 December 2017; Received in revised form 31 March 2018; Accepted 21 May 2018
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changes in management (Rønningen, 2010); and (3) *competitive performance*, the combination of existing resources that shapes customer service outcomes, enhances performance, and contributes to the overall competitive capability of hospitality organizations (Cohen and Olsen, 2013). Liu (2017) also asserted that the IC of the hospitality industry in an emerging economy may significantly influence competitive advantage, an idea that merits further research. Therefore, this study argues from a process-oriented perspective that competitive advantage depends on the degree to which hotels acquire intellectual capital and increase their capability for problem identification. Third, since second order analysis often reflects reality and eliminates the ambiguity in the evaluation of observed constructs (Tsai et al., 2015), we provide a second order analysis for hotel managers to identify the critical attributes of intellectual capital and competitive advantage. Our analysis can also serve to improve hotel managers' understanding of the competitive hotel environment in China, which can help them to formulate better marketing strategies and make more informed decisions in general. Fourth, combining the three contributions previously mentioned through the multiple mediation method provides the opportunity for a dynamic environment analysis. This analysis can represent the current state of the industrial environment and provide supplemental information to guide decision making, particularly by mining managers' opinions.

The proposed full model was tested with different statistical methods, which followed the suggestions from previous studies that applied structural equation modeling (SEM) analysis to examine the direct and indirect effects of proposed hypotheses and used regression to test the interaction effect (Hornig et al., 2016; Liu and Huang, 2017). We also examine the interrelationships between the different constructs of intellectual capital and competitive advantage. We evaluate these interrelationships in the context of simultaneously considering the potential mediating and moderating role of intellectual capital and competitive advantage in the linkage between different capital evaluation processes and competitive capability, in creating superior performance.

2. Theory and hypothesis

Although the intellectual capital literature, such as the contingency theory of intellectual capital (Williams, 2001), often explicitly acknowledges intellectual capital attributes (Rudež and Mihalič, 2007), much of the research related to intellectual capital has concentrated on the individual and reflects on various contextual constructs that influence an organization's performance and market status (Sydler et al., 2014). As a result, the intellectual capital aspect has not received attention commensurate with its importance and its consequent impact in the hospitality industry (Bontis et al., 2015a,b; Chen, 2008; Enz et al., 2006a,b; Kim et al., 2012; Rudež and Mihalič, 2007). A search of the literature relevant to intellectual capital reveals that the exact critical attributes considered to be involved in intellectual capital have differed somewhat in diverse conceptualizations. Nonetheless, theorists generally include three critical attributes: supportive culture (structural capital), market research (customer capital), and intellectual employee (human capital) (Bontis, 1998; Costa et al., 2014; Turner et al., 2015). For the purposes of the present research, we adapted the previous definition of intellectual capital, which includes the critical attributes of human capital, structural capital, and customer capital. The first dimension of *human capital* refers to the tacit knowledge and experience that each manager and employee individually possesses; thus, when this knowledge and experience are combined, the combination is one of the most valuable resources associated with an organization's success (Kim et al., 2012). The second of these critical attributes, *structural capital*, refers to the level of resource exchange and combination involving the following resources: mutual support, respect, culture and atmosphere. The interactions, exchanges and combinations of these resources between and among employees create the corporate culture and information flows (Bontis et al., 2015a,b). The final attribute of

customer capital refers to the value of a firm's relationships with its external stakeholders and its networks with suppliers, distributors, partners, and customers (Sydler et al., 2014).

According to theorization and subsequent empirical examination, we focus on competitive advantage because it has been found to encompass significant intellectual capital (Chahal and Bakshi, 2014) and is thus likely to better facilitate our understanding of the proposed phenomena of purpose. Moreover, the three attributes of competitive advantage are usually the most important in guiding competitive advantage and are therefore of major concern to organizations in this current dynamic environment. Competitive advantage is characterized by power (Ashford et al., 1989), innovative ability (Rønningen, 2010) and competitive performance (Cohen and Olsen, 2013). Because these three characteristics require knowledge and intellectual capital input, market advantage typically involves outcomes related to competition and engagement in problem identification development processes.

To fully understand the interrelationships between competitive advantage, problem identification, and intellectual capital, the theoretical underpinnings and logic of the proposed relationships must first be explored.

2.1. Direct and indirect effects of intellectual capital on competitive advantage

An organization's accumulated intellectual capital influences its propensity to reinforce its knowledge and skills. Intellectual capital is often used to change an organization's atmosphere, knowledge and interaction activities and is thus generally perceived to be a reliable and beneficial invisible asset for promoting change (Nahapiet and Ghoshal, 1998). Consequently, intellectual capital also biases an organization's problem identification and solving procedures, as the domains of intellectual capital through which organizations pursue new knowledge and activities closely follow and update the knowledge domains within the confines of their existing capabilities (Subramaniam and Youndt, 2005). Moreover, when organizations develop intellectual capital through structured recurrent activities, organizations strengthen their problem searching and identification skills and further increase their added value (Chen et al., 2005). Eventually, such institutionalization of an organization's value for problem identification and the instruments to use it recurrently is most evident in its intellectual capital. The rather generic definition of intellectual capital states that intellectual capital is intellectual material that has been formalized, captured, and leveraged to create higher valued assets (Sydler et al., 2014). Thus, we expect intellectual capital to reinforce the value and thereby influence the organization's problem identification capabilities.

Hypothesis 1. Intellectual capital is positively related to problem identification.

Overall, an established organizational identification capability increases an organization's innovative thinking with respect to problem-solving and leads to multiple possible acceptable solutions (Reiter-Palmon and Illies, 2004). It is just this ambiguity that allows for the emergence of innovative solutions and for the creation of more market opportunities compared to those of the competitors (Roberts and Amit, 2003). Similarly, problem identification not only helps an organization identify the relevant information related to the existing problem but also clearly generates new ideas and facilitates the evaluation of those ideas (Reiter-Palmon and Robinson, 2009). Participants who learn how to identify critical problems and construct those problems in multiple ways demonstrate an improvement in overall decision quality and originality, thus allowing their organization to maintain a competitive advantage (Dino, 2015). Hence, we expect problem identification to augment organizational capability by reinforcing multiple thinking and thereby strengthening the organization's ability to influence its competitive advantage.

Hypothesis 2. Problem identification is positively related to competitive advantage.

To understand how an organization understands and thinks about a problem from multiple perspectives, Reiter-Palmon and Illies (2004) evaluated whether the identification of central features of a critical problem and the decomposing or breaking down of a difficult problem would result in a greater understanding of the problem and an increase in the organization's competency. Such specific competency is a potential strategic asset that determines and sustains an organization's competitive advantage (Lado et al., 1992). Identifying a critical problem typically requires the incorporation of diverse opinions and novel, yet relevant, ideas, which then generate multiple perspectives (Carmeli et al., 2013). An important source of such problem identification capability is the intellectual capital that is embedded within the organization. Therefore, the progression of the competitive advantage creation process, problem identification as a mediator, and the subsequent enhanced organization performance provide an explanation of how intellectual capital is ultimately connected to competitive advantage. Why might an organization's intellectual capital increase its competitive advantage? Such a question suggests that a mediator mechanism must be considered for each of these relationships. As we briefly explained in the introduction to this article, we believe that this mediating variable is problem identification because competitive advantage will encompass status and innovative capabilities that extend beyond problem solving and identification capability (Reiter-Palmon and Illies, 2004). We base this view on research showing that an organization's problem identification capability tends to be greater when there are higher levels of intellectual capital (Hsu and Wang, 2012; Youndt and Snell, 2004), as well as on our belief that an increased competitive advantage results from employees' creative thinking and problem identification (Gong et al., 2009).

Intellectual capital seems conducive to an organization's problem identification capability and its maintenance of competitive advantage for several reasons. First, intellectual capital is grounded in an incremental conception of an organization's intangible assets—i.e., the idea that intangible assets are malleable (Joia, 2000; Sullivan, 2000)—and that such a conception builds efficacy beliefs (Rodov and Leliaert, 2002). Second, intellectual capital leads to a focus on innovative competence development (Leitner, 2015). Hospitality organizations that are capable of identifying and solving problems are likely to accumulate innovative experience and successful mastery over time (Kim and Lee, 2014; Wang et al., 2014). With this repertoire of skills and experiences, hospitality organizations should be more self-sufficient with regard to maintaining competitive advantage. Finally, the attribution pattern associated with developing intellectual capital helps to increase the capability of problem identification. Organizations with intellectual capital do not attribute competitive advantage endeavors to capability factors but rather to factors such as insufficient effort or ineffective development strategies (Bontis et al., 2015a,b). Therefore, it is hypothesized that multiple mechanisms of problem solving and identification can account for overall competitive advantage.

Hypothesis 3. A star hotel's problem identification ability fully mediates the relationship between intellectual capital and competitive advantage.

2.2. The interrelationships between intellectual capital and competitive advantage with a mediation hypothesis

Due to the increasing competition in the world economy, scholars have focused more intently on identifying the intellectual capital dimensions and examining the roles and effects of those dimensions on the organization's outcomes (Chahal and Bakshi, 2014; Subramaniam and Youndt, 2005; Turner et al., 2015; Williams, 2001). Engström et al. (2003) categorized three intellectual capital variables, including human

capital, structural capital, and customer capital. They found not only a stronger relationship between human capital and structural capital but that these two capitals yield greater profit with respect to business performance. In contrast, Rudež and Mihalič (2007) found that hotel management should also improve their intellectual capital, especially that of human capital and information technology, both of which are connected to responding quickly and efficiently to changing customer needs and thereby directly influence hotel performance. They further found that established human capital facilitates contact reliability and faith in the competitive environment, which helps hotels more effectively learn and acquire knowledge from their employees and their customers. Accordingly, human capital identification and development has become a critical issue for hospitality management.

Every service firm considers customer capital to be foundational; this concept includes how to increase customer satisfaction, loyalty and image, all of which affect managers' decisions and promotion strategies (Bontis et al., 2015a,b). Customer capital can be broadened to include structural capital, which also includes relationships with other competitors, local community, and other interest groups (Rudež and Mihalič, 2007). These relationships may help hotels respond to changes quickly. Further, a study of SAS Hotels and Resorts, a hotel chain in Norway (Engström et al., 2003), found a strong connection between human and structural capital. Accordingly, the earlier discussion suggests that customer capital as a foundation of intellectual capital may affect human capital primarily through structural capital. That is, the customer capital of a hotel acts as a valuable asset and platform for promoting favorable structural capital, which, in turn, enhances the development of human capital. Thus, this study proposes that structural capital plays a critical mediating role in the relationships between the independent variables of customer capital and the dependent variable of human capital.

Hypothesis 4. Structural capital positively mediates the link between customer capital and human capital.

From the competency-based perspective, an organization whose employees have a good ability to perceive problems, possess relevant knowledge and have the ability to think intuitively can achieve superior economic benefits relative to their competitors (DeFillippi and Arthur, 1994). Thus, it is necessary to examine the competitive advantage interrelationships among competitive performance, innovative ability and power. Competitive performance is an attribute whereby an organization's competitors are not able to replicate the organization's competitive strategies, value creation processes, or acquired rare resources. As such, competitive performance is reflected in the organization's superior performance over its competitors. (Barney 1991; Porter 1980). Non-replicable resources, capabilities, and strategies are the characteristics of a superior organization, and thus, they facilitate the development of innovative ability, which the organization then exploits to enhance its competitive performance (Chang, 2011). Innovative ability can create the unique capability to protect profit margins, and accordingly, it has become a critical source of competitive advantage in the era of a highly competitive knowledge economy (Prajogo and Ahmed, 2006). Innovative ability enables organizations with inimitable capabilities and ways of thinking regarding changes in the environment to support and sustain their advantages over their competitors (Costa et al., 2014; Dino, 2015).

Organizations require policies that empower their employees to produce innovative ideas regarding the development of new products and processes to satisfy customer needs (Ottenbacher, 2007). Previous studies have noted that empowerment policies and processes in an organization have positive effects on employee creativity and organization innovative ability (Tajeddini and Trueman, 2012). Thus, empowerment is an appropriate strategy to implement because it contributes to the organization's innovative ability to counteract threats. In other words, empowered employees improve product value, counteract threats, enhance innovative ability, increase competitive performance,

and thus make companies more competitive in the market. This study, therefore, asserts that innovative ability mediates the positive relationship between empowerment and competitive performance.

Hypothesis 5. Innovative ability positively mediates the link between empowerment and competitive performance.

2.3. The interrelationships between problem identification, heterogeneous knowledge and participation with a moderation hypothesis

With that being said, problem identification and solving are core competencies of organizational capability and thus influence an organization's market status and competitive advantage (van Meeuwen et al., 2014). By identifying the critical problem in organizational value creation or in attracting attention with a market opportunity, individuals may need to access interpersonal heterogeneous knowledge to enhance performance (Mannix and Neale, 2005). In support of this view, knowledge management studies indicate that heterogeneous knowledge, often viewed as the foundation of organization innovation, may not only enhance the breadth of information searching but also improve the quality of problem identification (Rodan and Galunic, 2004). Especially in dynamic environments, exposure to heterogeneous knowledge should improve both the problem identification capability potential of the focal managers, as well as their skill in searching, integrating and implementing their ideas to execute complex tasks and thus to increase organization overall performance (Moeen and Agarwal, 2017; Zach and Hill, 2017). Thus, we hypothesize the following:

Hypothesis 6. Knowledge heterogeneity and problem identification jointly and positively influence competitive advantage.

Furthermore, we hypothesize that the levels of *participation* of employees involved in the decision-making process will be helpful in heterogeneous knowledge integration and will also strengthen the relationship between problem identification and competitive advantage. Compared to knowledge heterogeneity, participation in the decision-making process may not only moderate the conflict of diversity but also enhance the effectiveness of new idea generation (De Dreu and West, 2001). Guillaume et al. (2014) asserted that although knowledge heterogeneity leads to more conflict and less commitment among group members, it also increases the widely task-relevant knowledge and improves searching skills. It has been found that employees are more likely to provide opinions on organization effectiveness and on the capability of problem-solving when they participate in the decision-making process (Ely, 2004). Moreover, it seems reasonable to assume that participation enfold its effects on organizational knowledge heterogeneity integration via innovative processes, similar to every other aspect of problem identification; it signals to the organization how to maintain and gain competitive advantage (Rodan and Galunic, 2004). Thus, we expect employee participation in the decision-making process contributes to moderate knowledge heterogeneity and strengthens the relationship between problem identification and competitive advantage.

Hypothesis 7. The relationship between knowledge heterogeneity and problem identification associated with competitive advantage is moderated by participation.

3. Method

3.1. Sample and data

The data for this study were obtained from star hotels in Xiamen and Quanzhou in 2015 based on the suggestion of Shahin and Dabestani (2010), who claimed that star hotels play a vital role in improving tourism quality and contribute to remarkable economic growth in historic cities. Quanzhou and Xiamen are two of the most representative

historical cities in Fujian Province, and accordingly, they have great growth potential due to the leisure activities brought by the tourism industry (Honggen and Huyton, 1996). Before comprehensive distribution of the questionnaire, we conducted a pilot and pretest survey of 32 hotel managers to measure the validity and reliability of constructs and to clarify the contents of questionnaire. To increase the response rate, the questionnaires were personally delivered by the researcher, who recorded the participants' comments regarding revisions of the content of the questionnaire. When all pilot and pretest surveys returned, we revised the items according to participants' comments and conducted an examination of the validity and credibility of the results. We subsequently distributed the revised questionnaire to hotel managers in the next phase. In the formal collection process, to achieve a representative and balanced distribution of star hotel manager responses, purposive sampling was used. Şanlıöz Özgen and Kozak (2015) suggested that purposive sampling is a practical and efficient tool to obtain relevant and plentiful data. This study's sample was obtained through the purposive sampling of star hotel managers. To increase the response rate and collect more reliable data, we contacted top-level managers through personal relations at each hotel and asked them to help us select a department manager who would then participate in this study through surveys and personal interviews. As displayed in Table 1, the sample consisted of 397 managers from different cities and levels of hotels. Meetings were then held with the selected participants, wherein the purpose of the study was explained, and the participants were allowed to ask questions regarding the study and the contents of the survey. The managers were asked questions related to intellectual capital, problem identification, and competitive advantage. The collected data from the various hotels, cities, and multiple sources not only enhanced the overall quality of the data but also significantly reduced the potential for common method variance (Podsakoff et al., 2003; Shen and Benson, 2014).

The questionnaires were personally distributed and collected in the workplace to increase response rates. We received 337 matched, completed, and useable questionnaires, for an overall manager response rate of 84.89%. With respect to sample characteristics, the average work experience in the study was 6 years, 39% of the respondents were male, and 55% of the sample had at least a college education. Overall, the individual characteristics of respondents were not a significant factor in influencing the hypothesized relationships.

3.2. Measures

The original measurement items were selected from well-known international tourism and hospitality journals through a comprehensive review of pertinent literature that was written in English. Since the measurement items used in this study are Chinese, back-translation methods were used to make sure that the original contents were maintained (Chen and Chen, 2010). Therefore, when the first version was complete, we asked two native speakers with abundant experience in tourism and hospitality research to translate the Chinese version into an English version. Then, the researcher revised the Chinese measurement contents to ensure that the meaning from the original English version contents was consistently maintained. The final survey items

Table 1
Questionnaire distribution and sample selection.

City	Star of hotel	Questionnaire Distribution	Percentage	Usable/effective Questionnaire
Xiamen	★★★	56	14.11%	48
	★★★★	46	11.59%	41
	★★★★★	82	20.65%	72
Quanzhou	★★★★	73	18.39%	60
	★★★★★	140	35.26%	121
		397	100%	337

Table 2
Summary of construct and item indexes.

Measurement items	Factor loading	AVE	CR
Customer Capital			
●A poll of our customers would indicate that they are generally satisfied with our hotel.	0.719	0.587	0.876
●Our hotel thrives on maintaining the most positive value-added services of any hotel in the industry.	0.776		
●We emphasize our customers' wants and strive to meet with customers.	0.769		
●We strive to receive as much feedback from our customers as possible, under the circumstances.	0.799		
●Our hotel prides itself on being market-oriented, and we are confident about our future.	0.764		
Structural Capital			
●Our hotel responds quickly to changes.	0.759	0.598	0.881
●Our hotel culture and atmosphere are supportive and comfortable.	0.789		
●Our hotel prides itself on being efficient.	0.789		
●Our hotel's systems allow for easy information access.	0.801		
●Our hotel facilitates support collaboration among its different departments.	0.727		
Human Capital			
●Our hotel supports its employees by constantly upgrading their skills and offering them education whenever it is deemed necessary.	0.788	0.639	0.779
●Our employees share experiences, creativity and knowledge with their colleagues.	0.810		
Problem Identification			
●Our employees spend considerable time trying to understand the nature of a problem.	0.761	0.568	0.798
●Our employees consider problems from multiple perspectives.	0.770		
●Our employees decompose a difficult problem/assignment into parts, to obtain greater understanding.	0.729		
Powerful			
●Our employees have sufficient power to control events that might affect them.	0.749	0.598	0.817
●Our employees can prevent negative things from affecting their work situation.	0.829		
●Our employees understand this hotel well enough to be able to control things that affect them.	0.739		
Innovative Ability			
●Our employees are good at perceiving problems.	0.729	0.549	0.785
●Our employees are intuitive thinkers and respond appropriately to changes in the work environment.	0.746		
●Our employees use their imagination to introduce new methods, products and services.	0.747		
Competitive Performance			
●Our hotel is well equipped to interact within a competitive environment.	0.758	0.608	0.756
●Our hotel has achieved competitiveness much faster than other hotels.	0.801		
Knowledge Heterogeneity			
●Our hotel likes to be in contact with other hotels that do not have services or products similar to our services and products.	0.861	0.681	0.810
●Our hotel likes to be in contact with other hotels that have a different knowledge base that can enrich our perspective on the world.	0.788		
Participation			
●Our hotel makes many decisions together with employees.	0.724	0.601	0.818
●Our hotel often consults employees on strategic decisions	0.789		
●Our hotel solicits employees' opinions on decisions that may affect them	0.811		

were measured on seven-point Likert scales. Response scales ranged from 1 (strongly disagree) to 7 (strongly agree). This study also conducted a pilot test to confirm the clarity, content validity and reliability of the questionnaire. Additional details regarding reliability and validity of the measured items are provided in [Table 2](#).

3.2.1. Human capital

Two items were developed based on [Bontis \(1998\)](#) to measure the extent to which employees possess intangible competence with respect to education, skill, creativity, and work experience. The Cronbach's alpha coefficient for human capital was 0.791.

3.2.2. Structural capital

A seven-item scale was developed based on the study of [Bontis \(1998\)](#) to measure the extent to which the respondents interact with their employees to create a supportive hotel culture and atmosphere because these factors play an important role in value creation. The Cronbach's alpha coefficient for structural capital was 0.903.

3.2.3. Customer capital

Based on prior studies, such as [Bontis \(1998\)](#), a five-item scale was developed to measure the extent to which the hotel's relationships contribute to customer satisfaction, value-added service, customer needs, and useful feedback. The Cronbach's alpha coefficient for customer capital was 0.849, which is above the value of 0.70 that previous studies have suggested.

3.2.4. Problem identification

Based on prior studies by [Perry-Smith \(2006\)](#) and [Reiter-Palmon and Illies \(2004\)](#), a three-item scale was developed to measure the extent to which the hotel's employees attempt to understand problems, consider multiple perspectives, and evaluate difficult problems. The Cronbach's alpha coefficient for problem identification was 0.802.

3.2.5. Powerful

Based on prior studies, such as [Ashford et al. \(1989\)](#), a three-item scale was developed to measure which people in the organization have the power to perceive the severity of a threat and counteract that threat to generate an overall perception of change. The Cronbach's alpha coefficient for powerful was 0.815.

3.2.6. Innovative ability

Based on the prior study of [Choi et al. \(2009\)](#), a three-item scale was developed to measure employee ability to perceive problems, be innovative, and use their imagination to improve the organization. The Cronbach's alpha coefficient for innovative ability was 0.747.

3.2.7. Competitive performance

Based on the prior studies of [Hughes et al. \(2007\)](#), a two-item scale was developed to measure which star hotel has the ability to interact within the competitive environment and achieve a performance that exceeds that of other hotels. The Cronbach's alpha coefficient for competitive performance was 0.717.

3.2.8. Participation

A three-item scale ($\alpha = 0.807$) to measure participation's employee participation in the decision-making process that was adapted from Zhang and Bartol (2010).

3.2.9. Knowledge heterogeneity

The questions used to measure the hotel managers' contacts with other hotels with different services and product were the questions used by Rodan and Galunic (2004). The Cronbach's alpha coefficient for competitive performance was 0.727.

3.2.10. Control variables

To control the potential influences of dependent and independent variables, we controlled for four demographic variables of hotel managers that have been found to potentially be meaningfully related to organizational competitive advantage (e.g., Bontis et al., 2015a,b; Casanueva et al., 2015). First, the hotel managers' age was measured by years because younger managers may bring more innovative ideas and entrepreneurship to an organization. Second, the managers' gender was measured as a dichotomous variable coded as 1 for male and 0 for female. Third, the managers' educational background was viewed as a critical attribute that influenced organizational innovation because of its relationship to the capability to address complex information, thus it was used as one of the control variables in this study. The final control variable was the managers' work experience, which reflected the managers' career experiences and was measured by the managers' number of years of work in the hotel.

4. Results

Table 3 presents the descriptive statistics and correlations for measuring the variables used in this study. As some correlations among the variables were relatively high, we used the variance inflation factor (VIF) to test for multicollinearity. All values of the VIF were below three, which indicates that multicollinearity was not a threat and that there were no serious collinearity problems related to the results.

The software of AMOS 18.0 was used to perform the structural equation modeling (SEM) analysis and examination of the hypothesis. This study followed the procedure from Tsai et al. (2015) to examine the second order constructs of intellectual capital (e.g., customer capital, structural capital and human capital) and competitive advantage (e.g., powerful, innovative ability, and competitive performance). Fig. 1 presents the standardized path of second order estimates of a seven-factor model for the examined relationships among the variables. Then, we used the first order factors to further analyze the relationships among the sub dimensions of intellectual capital and competitive advantage. The model demonstrated good fit indices that were above the acceptable thresholds, CFI = 0.958, GFI = 0.911, IFI = 0.959, and

RMSEA = 0.047. The chi-square values ($\chi^2 = 388.791$, $p < .001$; $\chi^2/df = 1.743$) also indicate the results are sensitive to sample size and thus comparatively reliable. Zainudin (2012) suggested that factor loading among measure items must be greater than or equal to 0.5. In this study, all items with factor loading exhibit values higher than 0.5. Furthermore, average variance extracted (AVE), and composite reliability (CR) is calculated to assess discriminant validity, since Nazim and Ahmad (2013) suggested that the minimum estimates required are 0.60 for CR and 0.50 for AVE, as shown in Table 2. All values were above these levels of acceptance. Furthermore, if the correlation coefficient among measuring constructs is higher than 0.85, then the discriminant validity is considered to be relatively weak and requires either further examination or removal from its constructs to increase discriminant validity (Nazim and Ahmad, 2013). On the other hand, if the correlations among constructs are lower than 0.85, this indicates that the measure constructs have discriminant validity. As shown in Table 3, the correlations among constructs are less than 0.85, which suggests that discriminant validity has been achieved and that no construct needs to be modified or dropped with our model.

With respect to our hypotheses, Hypothesis 1, which proposed a positive association between intellectual capital and problem identification, was supported ($\beta = 0.565$, $p < .001$). Further, the link between problem identification ($\beta = 0.972$) and competitive advantage is statistically significant at the $p < .01$ level, suggesting that the hotel problem identification capability is positively associated with competitive advantage. In addition, intellectual capital was indirectly ($\beta = 0.549$, $p < .001$) correlated with competitive advantage. Thus, problem identification fully mediates the relationship between intellectual capital and competitive advantage, thereby lending support for Hypothesis 3.

Further, in examining the mutual relationships of intellectual capital, the results indicate that the hypothesized model achieved a good fit ($\chi^2 = 107.389$, $p < .001$; $\chi^2/df = 2.065$; CFI = 0.976; GFI = 0.950; IFI = 0.977; and RMSEA = 0.056). The results for the standardized path estimates are summarized in Fig. 2. As Fig. 2 demonstrates, we found that structural capital fully mediates the relationship between customer capital and human capital ($\beta = 0.824$, $p < .001$). Accordingly, Hypothesis 4 is strongly supported.

Similar procedures were used to test Hypothesis 5. Hypothesis 5 states that empowerment is positively correlated with a hotel's competitive performance, through its effects on the innovative ability. The structural modeling results indicate that the model fits the data well ($\chi^2 = 26.582$, $p < .001$; $\chi^2/df = 1.477$; CFI = 0.990; GFI = 0.980; IFI = 0.990; and RMSEA = 0.038). Fig. 3 presents the overall structural model with standardized path estimates for competitive advantage. We found that this model's fit with the hypothesized model was significant ($\beta = 0.337$, $p < .001$). Thus, Hypothesis 5 was supported.

Table 4 shows the hierarchical regression analysis of interaction

Table 3
Descriptive Statistics, Correlations, and Reliabilities.

Variables	Mean	S.D.	1	2	3	4	5	6	7		
Intelligential Capital											
1. Customer Capital	5.216	0.961	(0.849)								
2. Structural Capital	5.237	0.953	.768**	(0.903)							
3. Human Capital	5.156	0.834	.682**	.731**	(0.791)						
4. Problem Identification	5.122	0.965	.419**	.449**	.469**	(0.802)					
Competitive Advantage											
5. Powerful	4.945	0.928	.369**	.388**	.562**	.430**	(0.815)				
6. Innovative Ability	5.080	0.934	.381**	.399**	.440**	.609**	.327**	(0.747)			
7. Competitive Performance	5.108	0.998	.349**	.318**	.343**	.617**	.276**	.573**	(0.717)		
8. Knowledge Heterogeneity	5.176	1.033	.440**	.408**	.543**	.354**	.418**	.413**	.317**	(0.727)	
9. Participation	5.061	0.990	.421**	.419**	.582**	.489**	.489**	.375**	.417**	.464**	(0.807)

N = 337. Internal reliabilities (alpha coefficients) for the overall constructs are given in parentheses on the diagonal.

** P < 0.01.

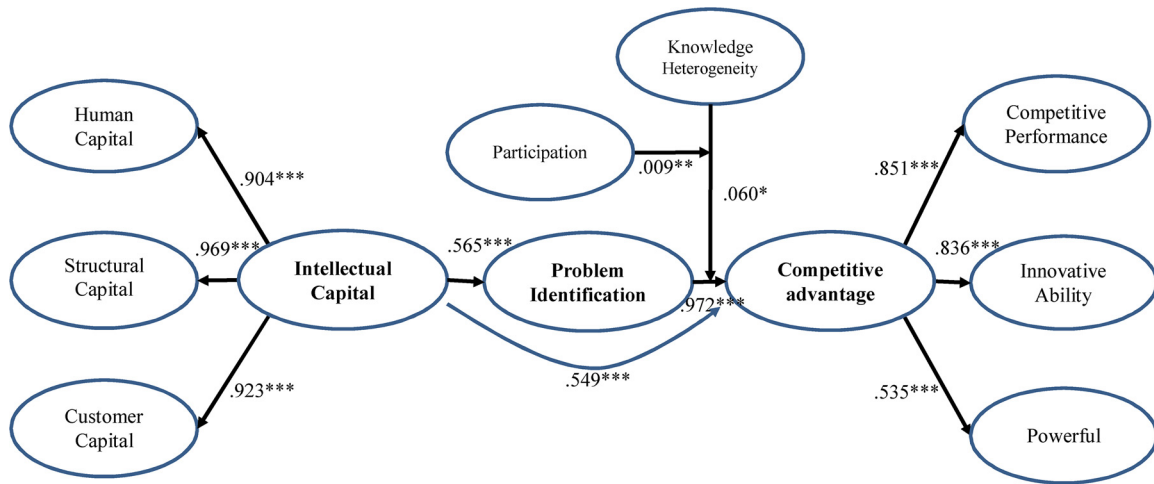


Fig. 1. Results of Proposed Research Framework.

effects of knowledge heterogeneity, participation and problem identification for predicting competitive advantage. Model 1 only shows the control variable and dependent variable of competitive advantage. Model 2 added the independent variable of problem identification, knowledge heterogeneity and participation. The results of Hypotheses 6 is shown in Model 3, which confirmed that an interaction between problem identification and competitive advantage is strengthened by knowledge heterogeneity ($\beta = 0.060$, $p < .05$). Fig. 4 demonstrates the form of the interaction. We followed Aiken and West's (1991) steps and interaction slope analysis to evaluate the form of the interaction effects of the moderating variable and the independent variable to the dependent variable. This analysis revealed that the relationship between problem identification and competitive advantage was strengthened and was significantly positive when knowledge heterogeneity was high.

Model 4 of Table 5 presents the final results of the interaction effects analyses testing of knowledge heterogeneity, problem identification, and participation in the prediction of hotels' competitive advantage. The analysis of the three-way interaction followed Lian et al. (2014) steps and multiple interaction examinations to evaluate the form of the interaction effects of the moderating variable of participation and knowledge heterogeneity on the dependent variable of competitive advantage. More specifically, the results show that the three-way interaction of knowledge heterogeneity, problem identification, and participation was significant in predicting competitive advantage ($\beta = 0.009$, $p < .01$). The relationships and slope of the three-way interaction of knowledge heterogeneity, problem identification, and participation, depicted in Fig. 5, indicated that the relation between problem identification and competitive advantage was strongest when employee participation in the decision-making process was high and knowledge diversity was high. These results provide support for Hypothesis 7.

Table 5 presents the value of fit indices for the hypothesis models and comparisons of nested structural models. The significant difference

($\chi^2 = 388.791$, $\chi^2/df = 1.743$, $p < .001$) between the hypothesized model in Fig. 1, intellectual capital ($\chi^2 = 107.389$, $\chi^2/df = 2.065$, $p < .001$) in Fig. 2 and competitive advantage ($\chi^2 = 126.582$, $\chi^2/df = 1.477$, $p < .001$) in Fig. 3 provided the basis for further examination of various nested models. Significant differences between the hypothesized model and comparison models suggested that adding additional paths to the hypothesized model did not significantly improve the overall model fit, thus confirming that the original hypothesized model provides the best model fit in this study.

5. Conclusion and discussion

This study examined the mutual relationships between dimensions of intellectual capital, including customer capital, structural capital and human capital, when creating competitive advantage. The results indicate that intellectual capital may directly and indirectly facilitate competitive advantage in the highly competitive hotel industry. More specifically, intellectual capital is positively related to problem identification, which, in turn, is positively related to competitive advantage. These findings highlight the critical roles of intellectual capital in the hospitality industry and identify the different aspects of competitive advantage. The implication of our results is that hotels must actively manage their intellectual capital by investing in three related intangible attributes: human capital, structural capital and customer capital. These findings show that the value of intellectual capital in hospitality organizations is inextricably tied to competitive advantage. The importance of intellectual capital not only influences Asian hotel industries' competitive advantage but also affects Slovenian hotel industries' financial performance (Rudež and Mihalič, 2007). Therefore, to effectively increase intellectual capital, hospitality managers may suggest increasing mutual trust among employees, improving relationships with customers, and promoting the sharing of information and knowledge among colleagues (Enz et al., 2006a,b). Given that competitive advantage is a consequence of collaborative effort and the accumulation of intangible

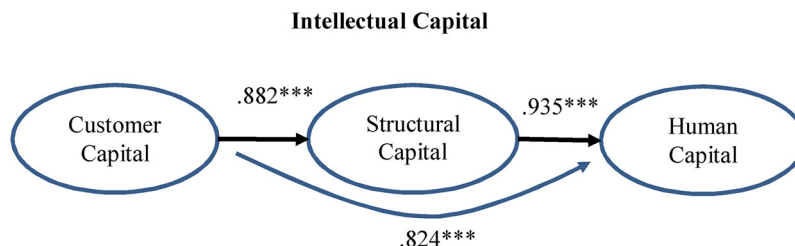


Fig. 2. Results of relationships among Intellectual Capital.

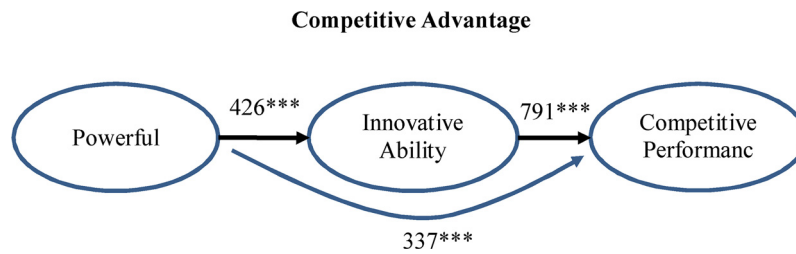


Fig. 3. Results of relationships among Competitive Advantage.

Table 4

Results of the hierarchical regression analysis of three-way interaction between knowledge heterogeneity, participation and problem identification for predicting competitive advantage.

Variables	Competitive Advantage			
	Model1	Model 2	Model 3	Model 4
Control variable				
Gender	-0.140 (0.087)	-0.031 (0.056)	-0.035 (0.056)	-0.036 (0.056)
Age	0.005 (0.078)	0.015 (0.050)	0.026 (.050)	0.026 (0.051)
Work Experience	0.021 (0.011)	-0.003 (0.007)	-0.003 (.007)	-0.003 (0.007)
Education	0.065 (0.068)	0.023 (0.044)	0.020 (0.044)	0.020 (0.044)
Independent variable				
Problem Identification(PI)		.434*** (.032)	.746*** (.169)	0.780 (0.544)
Knowledge Heterogeneity(KH)		.166*** (.029)	0.113 (0.153)	0.150 (0.587)
Participation(P)		.133*** (.033)	-0.065 (0.192)	-0.025 (0.635)
Two-way interaction				
PI*KH			.060* (.026)	-0.052 (0.113)
PI*P			-0.045 (0.031)	-0.026 (0.115)
KH*P			-0.018 (0.026)	0.051 (0.126)
Three-way interaction				
PI*KH*P				.009** (.023)
Model fit				
R ²	0.028	0.605	0.613	0.614
R ² _{adj}	0.011	0.595	0.599	0.599
F	1.62	55.70***	42.78***	39.36***

* P < 0.05.

** P < 0.01.

*** P < 0.001.

assets (Kim and Oh, 2004), intellectual capital assumes a central role in improving problem identification capability. Thus, effectively accumulated problem identification capabilities can increase a hotel’s understanding of a critical problem to the extent that multiple perspectives and assessments of the problem that fit within the context of the hotel’s dynamic environment and changing customer needs are considered; this results in an improved competitive advantage. Investments in developing intellectual capital may therefore be fundamental for developing a range of problem identification capabilities, gaining the flexibility to adapt to a changing environment, or exploring these capabilities to capture market opportunities or competitive exigencies. Accordingly, intellectual capital may be the key not only to creating ambidextrous organizations but also to helping organizations develop “dynamic capabilities” that enable them to shift their competitive focus and achieve competitive advantage (Subramaniam and Youndt, 2005).

Furthermore, to facilitate the link between intellectual capital and

competitive advantage, hotel managers must acknowledge the importance of internal factors, such as employee knowledge, ability and professional skills. Thus, training programs that help employees to understand new technology and market trends, satisfy customers’ needs, or assist other colleagues in forming positive attitudes (such as autonomy and openness to learning) may all be helpful for accumulating an organization’s human capital and may boost employees’ positive feelings in the face of challenges. Furthermore, organizations can also create a climate of supportive leadership that encourages employees to interact more with customers or take part in external training programs to acquire useful information from customers in order to change, understand real needs to adjust the organizational structure, and/or change the organization’s overall service or product development mechanism. Following this change process, a hospitality organization may not only facilitate an employee’s learning orientation and successful completion of developmental assignments, but hotel managers may also learn and acquire new knowledge more efficiently from employees and customers. This would be helpful in developing an organization’s problem identification capability and thus contribute to an improved favorable performance that maintains the hotel’s competitive advantage. In addition, we also conducted three-way interaction models to help hospitality managers to better understand when problem identification results in competitive advantage. By developing multiple mediation-moderation models, we suggested and found that knowledge diversity and participation contribute to an organization’s competitive advantage (Felin and Hesterly, 2007; Rodan and Galunic, 2004): the increase of both knowledge heterogeneity and participation results in the strongest relationship between problem identification and competitive advantage.

With respect to the different dimensions of intellectual capital, i.e., customer capital, structural capital and human capital relationships, the results show that customer capital is positively related to structural capital, which is then positively related to human capital. In the service industry, hotels must maintain a highly positive value-added service and reputation and emphasize customer wants to increase customer satisfaction and obtain useful feedback. In terms of structural capital, when receiving customer feedback, hotels must create a supportive culture that is capable of responding quickly to changes in the environment and to customer needs. In addition, a hotel human resources department must hire well-educated employees, provide sufficient training, encourage multiple perspectives when identifying and addressing problems and customer needs, and inspire employees to decompose a difficult problem or task into parts, thus accumulating and exploiting the human capital available in the hotel. Further, the empirical results of this study found that the relationship between ability and competitive performance must be strengthened through innovative ability. Hence, it is suggested that empowering employees and providing them with sufficient resources will prevent negative factors from affecting their work situation and will increase the hotel’s innovative ability, thus inducing an enhanced competitive performance. Therefore, in the era of knowledge economy, empowering employees and giving them more freedom and involvement with the decision-making process will encourage them to respond more positively and effectively to changes in the work environment and will accordingly enhance the

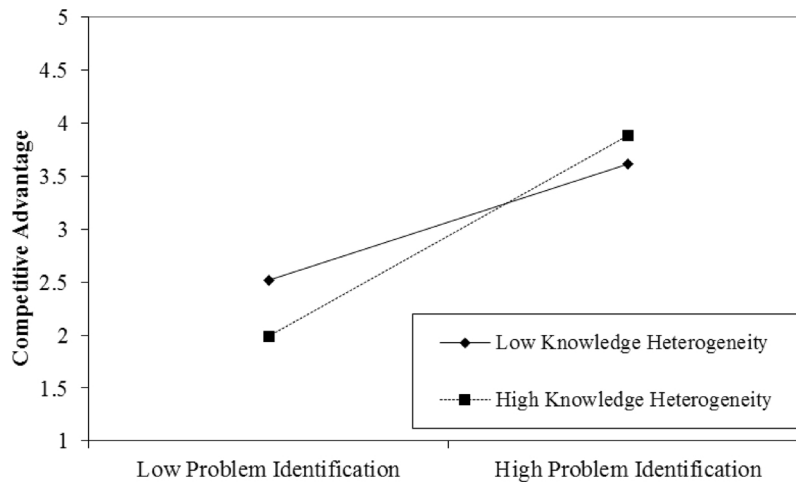


Fig. 4. Interaction plots for the moderating effect of knowledge heterogeneity to problem identification and competitive advantage.

hotel’s innovation performance and competitive advantage.

Finally, our study should temper the belief that organizational competitive advantage will remain in place as organizations assemble the mechanism of problem identification integrated with knowledge diversification, or at least should make us aware that creating a highly participative atmosphere does necessarily lead to a mutual trust that is also helpful in integrating heterogeneous knowledge into an increased problem-solving capability (Moeen and Agarwal, 2017). The importance of this awareness of knowledge diversification is particularly noticeable if we consider the organizational innovation process. From the micro to macro viewpoint, building and maintaining a competitive advantage with an internal capability of problem identification and knowledge diversification integration to external competitive advantage is certain. The manager, as an organizational innovation promoter, needs to constantly encourage employee interaction with experts in different fields to access diverse knowledge to inspire employee creativity and further enhance innovation (Zach and Hill, 2017). Maintaining and creating an innovative environment requires time and effort. While we do not dispute that a problem solving and identification capability does offer advantages, managers should also consider providing an employee participation mechanism, which may strengthen the above connecting relationship to competitive advantage. In summary, recognizing that knowledge heterogeneity is no guarantee of a problem identification capability improvement, managers should consider building an amicable participation mechanism and an environment that decreases knowledge diversity conflict and increases the problem identification capability and facilitates effectiveness, rather than only focus on one organization mechanism.

The findings of this study make several important contributions to the literature. First, this study contributes to the theoretical development regarding the multiple mediation relationships between intellectual capital and competitive advantage and further examines the

moderation effects of problem identification, knowledge heterogeneity and problem identification on competitive advantage. Prior studies on the tourism and hospitality industry have emphasized the effects of intellectual capital on knowledge management (Hallin and Marnburg, 2008), financial performance (Rudež and Mihalič, 2007), and profitability (Enz et al., 2006a,b). However, until now, few studies have examined the mediation-moderation relationships between intellectual capital, knowledge management and performance implications with respect to competitive advantage. This deficiency is serious because of the increasing importance of internal and external capital on increasing the competitive advantages of hotels. Second, although problem identification has been recognized as an important contextual variable contributing to the development of the organizational climate, innovative, organizational scholars have sought to classify problem identification factors that either facilitate or inhibit organization capability in a variety of settings (Reiter-Palmon and Illies, 2004). Accordingly, this study built up the conceptual model and hypothesized the mediating and moderating role of problem identification between the relationships between intellectual capital and competitive advantage in the hotel industry. Third, based on a process-oriented view of the investigated interrelationships among dimensions of intellectual capital, we hypothesized that structural capital mediates the effects of human capital and customer capital. Our results join prior research (Sydler et al., 2014) that suggests that structural capital serves as a necessary conduit to enlarge organizational knowledge stocks and highlights the critical role of structural capital in knowledge management activities. The fourth contribution of this study is the derivation of empirical support for the model’s prediction by using data from star hotels. The empirical evidence of structural equation modeling (SEM) supports the mediating effect of innovative ability on the relationships between the two antecedents of power and competitive performance. The empirical evidence of this study fills the gap in the tourism and

Table 5
Comparisons of nested structural models.

Models	χ^2	χ^2/df	CFI	GFI	IFI	RMSEA	Original
<u>Hypothesized model-Full Variables</u>	388.791	1.743	0.958	0.911	0.959	0.047	Fig. 2
Compare model: Add Path							
Intellectual capital → Competitive Advantage	409.637	1.837	0.953	0.906	0.953	0.050	
<u>Hypothesized model-Intellectual capital</u>	107.389	2.065	0.976	0.950	0.977	0.056	Fig. 3
Compare model: Add Path							
Customer capital → Human Capital	107.300	2.104	0.976	0.947	0.976	0.057	
<u>Hypothesized model-Competitive Advantage</u>	26.582	1.477	0.990	0.980	0.990	0.038	Fig. 4
Compare model: Add Path							
Powerful → Competitive performance	26.085	1.534	0.990	0.980	0.988	0.040	

Note: CFI = Comparative Fit Index; GFI = Goodness-of-Fit Index; IFI = Incremental Fit Index; RMSEA = Root Mean Square Error of Approximation.

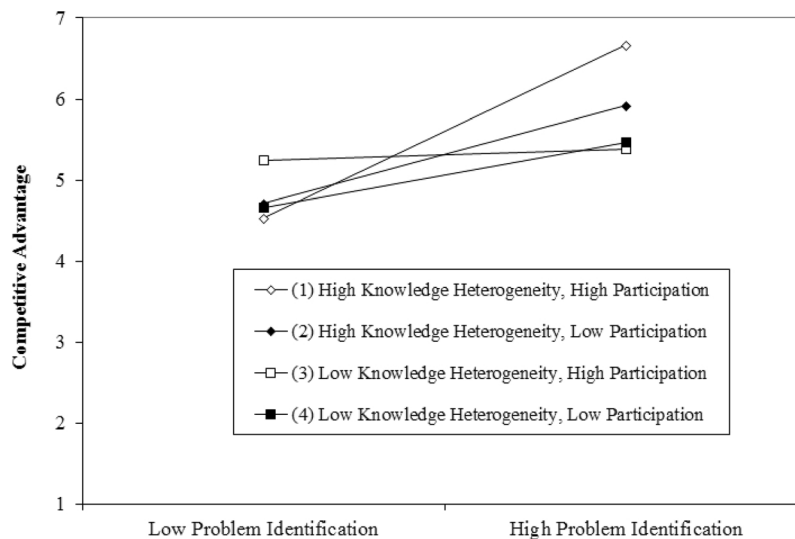


Fig. 5. Interaction plots for the moderating effect of knowledge heterogeneity, participation in problem identification and competitive advantage.

hospitality literature regarding the empirical examination of the roles of competitive advantage in the highly competitive context of the hospitality industry.

There are several limitations specific to this study and suggestions for future research. First, we contend that conducting the study with star hotels and focusing on special regions results in a more accurate and reliable model. However, it also increases the need to compare these results with those from other more diversified countries and cities that have different regulations and different cultural and societal elements before the findings can be extended and generalized to other regions. Second, it would also be interesting to incorporate the findings of this study into other tourism and hospitality fields because doing so could reveal implications regarding differences across sectors and provide potential contributions to future hospitality industry operations. Third, although the research is somewhat limited with respect to the competitive advantage development processes, it is particularly lacking in the processes of innovation and evaluation of critical competitive attributes. Future research should focus on the factors that influence innovation and critical competitive attribute evaluation processes and how managers and leaders can best facilitate this process. One final important point is to analyze the star hotel's competitive advantage through self-reported data of managers, though it may be subject to common method variance. Although this study used procedural remedies and single factor statistical tests to avoid its effects (Lin and Shih, 2008), common method variance may still exist and is noted as a potential limitation of this study. Therefore, it is suggested that future studies use alternative methods and tests to detect and avoid the problem of common method variance.

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