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Relationship between Knowledge Transfer and Innovation in Tourism Industry

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Abstract: *Technological advances, availability of similar goods and easier ways of attaining knowledge in the marketplace make the issues of innovation more important than ever before. Firms need innovation in order to survive in the competitive market and to enhance their competitiveness. Firms need various sources and knowledge to perform innovation activities. One way to reach these sources is knowledge transfer and knowledge sharing. Knowledge transfer can be achieved in various ways, for example through networks. The objective of this paper is to reveal the relationship between knowledge transfer and networks with technology and innovation in the hotel sector in the Antalya Province. The results of the analysis support that there is a significant relationship between technology and innovation with knowledge transfer and networks.*
Keywords: *Knowledge transfer; networks; technology; innovation; hotels*

I. Introduction

Innovation plays an important role in the changing of market conditions and competitive tools, and the achievement of competitive strategies. According to Higgins (1995) the secret to competitive advantage is innovation. However, innovations benefits are not only limited to gaining a competitive advantage, they can also help firms to meet all of their strategic challenges (Higgins, 1995).

Firms that implement innovation in a successful way can have an advantageous position. Researchers (Becker and Whisler, 1967; Schwartz, 1982; Kaimen and Porter, 1990; Drucker, 1998; Hjalager, 2002; Weidenfeld, 2013) define innovation in various ways. Schumpeter (1939), who first described the innovation, distinguishes between inventions and innovations. Inventions are connected with basic technological research. Inventions are not aimed at specific industrial use. On the other hand, innovations are further developments of inventions, or bright creative ideas which make them into useful services or products (Hjalager, 2002).

Innovation creates wealth through either endows resources with enhanced potential or creating new wealth-producing resources (Drucker, 1998). Therefore, innovations are a function of entrepreneurship. According to Becker and Whisler (1967), on the other hand, the early use of creative ideas by one of the firms in competition that have similar goals is innovation. Kamien and Schwartz (1982) define innovation as activities which create new products/services or production processes. Porter (1993), in light of Schumpeter's studies, claims that firms can achieve a competitive advantage through technology and innovation. Porter examined innovation in the context of both new technologies and new ways of doing business.

Different researchers (Abernathy and Clark, 1985; Hjalager, 1997; Weiermar, 2006) conducted different types of innovation. The types of innovation are generally categorized according to results and priority of innovation. In the innovation literature, researchers often use four types of innovation: process innovation, service/product innovation, organizational innovation and marketing innovation. Innovations can take place in a combination of these four types of innovation or one (Hjalager, 2002).

There are many researchers studying the relationship between innovation and the manufacturing (Dmitrij et al., 2014; Zheng and Kammen, 2014) and service sectors (Drucker, 1998; Johne, 1999; Preissl, 2000; Rademakers, 2005; Hamel, 2006; Eraslan et al., 2008; Carlisle et al., 2013; Thomas and Wood, 2014, Nieves and Segarra-Cipres, 2015). According to Hjalager (2015) there are numerous innovations (GPS, social media, e-ticketing, online maps, so on) that directly or indirectly affect the tourism sector. However, the numbers of studies dealing with technology and innovation in the tourism sector are low compared to other economic areas (Hjalager, 2002). In particular, the amount of research aiming to measure technology and innovation in the tourism sector is scarce (Coombs and Miles, 2000). Although, according to some studies there is a relationship between the developments of the tourism sector and the level of innovation (Hjalager, 2002). Furthermore, some studies (Hjalager, 2002; Sintes et al., 2005) find that knowledge transfer is important factor for innovation and competitiveness. The aim of this paper is to examine the relationship between knowledge transfer and networks and technology and innovation in the tourism industry in the Antalya Province.

In the manufacturing sector today, human capital is still essential for most factories to carry out a variety of manual operations, in spite of the rapid advancement of automation technology and robotics. Futuristic vision of "unmanned manufacturing" (Deen 1993) is forbiddingly expensive, because all its hardware components need to be computer controlled so as to freely communicate with each other; and yet, most of the

outcomes are not promising (Sun & Venuvinod 2001). By and large, factories equipped with relatively simple machinery controls will require continuous attendance of human operators; for examples, textile mills, leather products, and medical appliances. With limited capital investments in production equipment, the main budget of their fixed costs lies on the workforce size (Techawiboonwong *et al.* 2006).

With regard to cost-effectiveness, labour planning always opts for the minimum amount of workers needed to deal with the daily operations, as well as the probable rate of disturbance (Lim *et al.* 2008). The workforce disturbance is often ascribed to absenteeism and turnover, which may result in considerable loss of productivity for any labour-intensive division (Easton & Goodale 2002). Buffering with redundant skilled workers (Molleman & Slomp 1999) or relief workers (Redding 2004) might be a direct solution to absenteeism; however, the rising labour cost must be justifiable due to the fact that underutilisation of labour during low demand seasons is considered a waste of resources. Absenteeism is the measure of unplanned absences from workplace due to some reasons like personal emergency, accident, illness, etc. Turnover occurs when an active worker resigns from the company of his own accord, thus leaving a vacant post until a replacement is found. If such disturbance has caused a large number of tasks become unattended and overdue, the company is then vulnerable to overtime cost, shrunk capacity and productivity, extra queuing time, lost business income, etc. In order to prevent these deteriorative effects, optimising the number of workers can be helpful. As a fundamental branch of knowledge in manufacturing business, workforce management will never fall behind the times. Therefore, it is worth an attempt to incorporate a novel methodology, such as HMS, into the state of the art of workforce sizing.

II. Innovation in Tourism Industry

The literature to date (i.e.; Hjalager, 2002), focusing on the innovation in the tourism industry, mostly utilizes either Abernathy and Clark's (1985) model, or the Schumpeterian model.

Abernathy and Clark (1985) developed an innovation model for the establishment and development of the automobile industry. This model has also been applied to other sectors. The model incorporates four types of innovations: Niche, regular, revolutionary, and architectural. Niche innovation includes the promotion of the entrance of new entrepreneurs to use business opportunities, combine existing products in new ways, and encourage firms to participate new marketing strategic alliances. Regular innovation covers training employees and proprietors to operate more efficiently, promoting new investments that raise productivity, incremental raise of standards and quality. Revolutionary innovation covers the introducing new methods that shift the diffusion of new technology to the firms, composition of staff, and the attachment to the same markets with new or improved methods. Last type of innovation model of Abernathy and Clark (1985) is architectural innovation. Architectural innovation includes redefining the physical or legal infrastructure, creating new attractions and events that demand reorganization, creating centers of excellence that disseminate and treat knew operational research based on knowledge (Hjalager, 2002, p. 467).

In tourism industry regular innovations include new investments in large structures, internal and external training of personnel, and upgrading quality standards in well-defined ways and approaches to newly emerged markets with the same or new methods and services (Hjalager, 2002). In niche innovation, researchers tend to focus on opportunities. (Eraslan et al., 2008).According to Hjalager (2002) revolutionary innovations keep external structures stable; they have a radical effect on organizational competences. For instance, electronic marketing and sales are not the same as distributing brochures (Hjalager, 2002). The main purpose of architectural innovations is to establish new rules and alter overall structures (Eraslan et al., 2008).The Abernathy and Clark model can be criticized for being too static and descriptive (Hjalager, 2002).

The Schumpeterian approach has been applied only to some extent in tourism research. Hjalager (1997) provides a categorization nearly identical to Schumpeter's original one, while Weiermair (2006) modifies the Schumpeter's model markedly. Product, process, organizational and market innovations constitute the body of the innovation categories. Product/Service innovation is a service or good that is significantly improved or new. This includes significant improvements in components and materials, technical specifications, software for the product, user friendliness or other functional characteristics (OECD, 2005). Innovation in the hospitality sector is different from manufacturing sector. According to Elçi (2006) these types of innovations require technology, organizational competences, as well as human resource talent. Firms need to restructure their human resource talent, organizational competences and technology according to current conditions (Elçi, 2006). The reason for process innovation is increasing productivity and efficiency. Generally, the bases of the main ideas of process innovation are investments and technological advances (Hjalager, 2002). On the other hand, aim of marketing innovation is improving service quality and development of the marketing mix. Thus, firms need marketing innovation to understand potential markets and to provide a quality service to targeted customers (Johne, 1999). Innovations in terms of managerial techniques, organizational models, organizational structures, and strategies named as organizational innovation (Hamel, 2006). Organizational innovation covers personnel responsibilities, duties and new methods to control and coordinate personnel (Rademakers, 2005).

III. Innovation at Network Level

The innovative activities of a firm depend on the structure and variety of its links to sources of knowledge, information, technologies, financial and human resources, and practices. Each linkage connects the innovative firm to government laboratories, policy departments, universities, regulators, suppliers, competitors, and customers (OECD, 2005).

Innovation theories claim that networks are important factor for technology and innovation. According to Holmen et al. (2004) networks occur from the inter-firms formal and/or informal relationships wherein a transfer of tangible and/or intangible resources was made. Innovation theories support the innovation process by facilitating knowledge transfer, learning sharing, and coordination of production and product activities (Holmen et al., 2004).

According to Gulati (1998) a relationship network is a set of nodes (e.g. organizations, staff) linked by a set of social relationships (e.g. friendship, overlapping membership, transfer of funds) of a specified type. While the main focus of the relationship networks research was on understanding how networks of individuals influence their behavior, the approach can be applied to role of inter-firm networks in innovation (Ahuja, 2000). Thus, such innovations networks are important and good sources of knowledge and reaching to such information is depending on firms' network structures (Gulati, 1998). According to Hoarau and Kline (2014) tourism industry share tacit and explicit knowledge.

IV. Knowledge Transfer Model and Innovation

Owing to studies (i.e.; Cowan et al., 2001; Sintes et al., 2005, Hoarau and Kline, 2014) related to hospitality sector, we can say that knowledge transfer is an important factor for innovation, technology and competitiveness. Zack (1999) identified three different categories of knowledge at the firm level: basic knowledge is knowledge that firm has to understand sector, high level knowledge is knowledge that differentiates firm from rivals, and strongly innovative knowledge is knowledge that supports firms to produce innovative products and services. Firms transfer knowledge by using a variety of channels. Figure 1 illustrates these knowledge transfer channels.

As seen from Fig. 1, there are eight different knowledge transfer channels for firms. According to OECD manual (2005), however, firms firstly need to identify which department (i.e., marketing, R&D, distribution, production) has important knowledge sources for innovative activities. Firms can develop a knowledge flow system within the firm through these departments, and eventually they can turn the creative ideas into innovation.

Another knowledge transfer channel is suppliers. According to Cowan et al. (2001) suppliers support and facilitate the knowledge transfer process of firms because they provide equipment which has knowledge inherent in them. In addition, suppliers provide knowledge as to how a firm sets up new technological equipment, how a firm uses new equipment, and the difference between newly emerging technological equipment. In addition, suppliers provide knowledge about technological competencies and which equipment the rivals of firms use to compete on global base (Cowan et al., 2001).

According to Schilling (2005) the creativity of a firm is derived from a diversity of social process inherent in the interaction of personnel working in a particular firm. The structures and procedures of firms either encourage creativity or hinder it. Firms which have with successful innovations are able to utilize various innovative resources too. While firms can reach these resources through R&D department, marketing department or distribution channels, they can also reach these resources by using external sources such as rivals, customers, consultants, commercial laboratories, etc. In addition the feedbacks of customers are a particularly fruitful way of obtaining innovative knowledge (OECD, 2005).

According to Lundvall (1988) innovation is not a process that excludes the external world. Innovation is an interactive process in which both customer and firms bring about creative ideas. Firms may learn ideas and knowledge, why services did not accepted by customers, and which services will have demand now and in future from customers. Customers may learn new products, and how to use new technological services from firms (Lundvall, 1988).

Internet as a knowledge transfer channel is in high demand. According to Cowan et al. (2001) this is result of globalization. Globalization affects all economic industries, and the internet can provide knowledge throughout the world within a short amount of time and cost. (Cowan, 2001)

Universities are also an important source of innovation. Universities encourage their faculties and institutions to realize successful innovations. Universities contribute many activities of innovation through sharing their analysis, results of their studies and reports to the general public. Firms practice innovation activities by using these knowledge sources (Cowan et al., 2001). Briefly, these publications are an innovation source for firms.

Local authorities in which firms operate are sources of innovation. According to Lundvall (1988) local authorities reconnoiter in the markets to having the big portion of market for their region. These studies include

the culture of a region, traditions, and potential customers. This is an easy and important way to provide needed knowledge about innovation to firms. Non-governmental organizations also contribute towards the innovation activities of firms by supporting them. These organizations provide innovation sources by teaching the personnel of firms.

Talent owned by human resources is another important knowledge source for firms (Hitt et al., 2001). People have knowledge and talent to transform an idea into innovation. According to Lepak and Snell (1999) human resource systems have a considerable effect on the capacity of the creation of knowledge within the firms. Thus, firms need to train their personnel to obtain new creative knowledge.

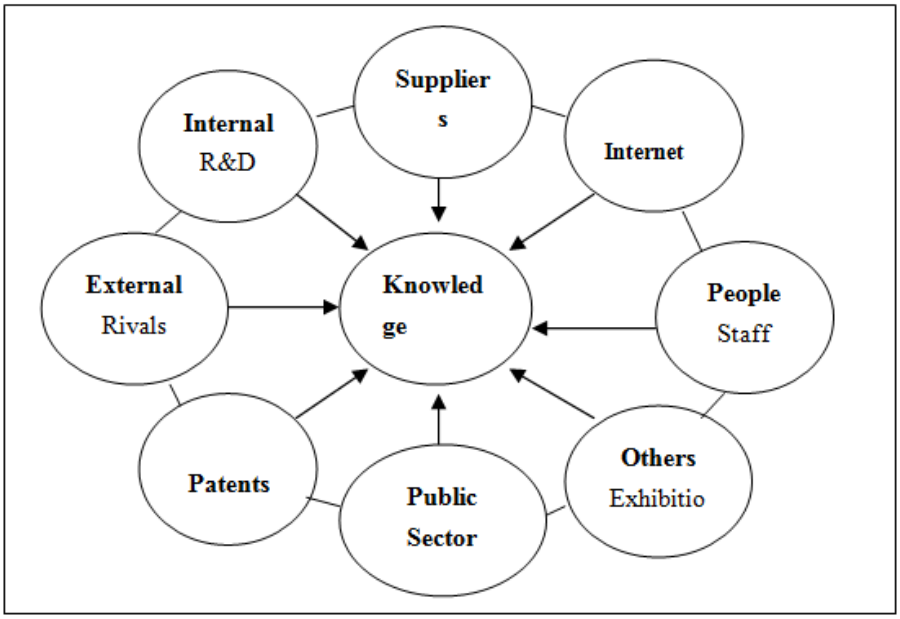

Figure 1. Channel of knowledge transfer (Prepared by authors)

Patents can lead activities of innovation because patents consist technological knowledge. Firms which apply for a patent need to provide knowledge about their new product or service, which makes this a source of knowledge for other firms (Cowan et al., 2001).

In addition, conferences, meeting, exhibitions and fairs, professional and trade associations, informal contacts and networks, standards and standardization organizations are accepted as knowledge transfer channels because they share their studies and publications with firms (OECD, 2005).

V. Methodology

A questionnaire was prepared in order to collect data. The questionnaire was employed to tourism firms operating in Antalya Province. As of the date 30.09.2014 there are 761 accommodation firms (304 units 5 star, 237 units 4 star, 141 units 3 star, 57 units 2 star and 22 units 1 star) serving as hospitality business in Antalya (http://www.antalyakulturturizm.gov.tr). These accommodation firms constitute the population of the research.

The questionnaire utilized in this paper consists of three parts. The aim of the first part is collecting data about the demographic characteristics of tourism industry worker who answered the questionnaire. To this end, participants' age, gender, marital status and educational level were asked to participants. There are six statements about technology and innovation in the second part. These six statements measure the comparison of tourism sector of Antalya Province with world tourism sector in terms of the level of technology used, products and services innovation, the production innovation of products and service, marketing process innovation and managerial innovation. This comparison was performed by a 7 point likert scale ('1: Disagree', '7: Strongly Agree'). In the third part, statements about networks and knowledge transfer were asked by using a7 point likert scale ('1: Disagree', '7: Strongly Agree'). The aim of the third part is measuring the perception of participants. There are 17 statements about networks and knowledge transfer.

The questionnaire was sent out to mid-level and top-level managers of tourism firms in the Antalya Province. In total, there were 383 respondents, which were filled out by mid-level and top-level managers. Cronbach alpha value was calculated to determine the reliability of the scales. Cronbach alpha of technology and innovation scale was found to be 85% while Cronbach alpha of knowledge transfer and networks scale was found to be 91%. It could be argued that the scales are reliable because the values obtained are higher than 70% (Hair et al, 2009).

Furthermore, a frequency analysis was performed to reveal the demographic characteristics of the participants in the context of the age, gender, marital status and educational levels. Then, an exploratory factor analysis was performed to obtain dimensions about technology and innovation, and knowledge transfer and networks. Therewithal, the varimax rotation was used in exploratory factor analysis to ensure the reliability of questionnaire. A reliability analysis was conducted for the obtained dimensions. After that, a correlation analysis was conducted to ascertain the relationship between the technology and innovation, and dimensions. Before conducting correlation analysis, scatter diagram was used in order to testing linearity among variables.

Job-shop production refers to a manufacturing environment that produces goods in small batches according to customer specifications. Usually, one or several types of products are deliverable, while the incoming orders may differ in the design, quantity, process flow, or urgency (Henrich 2005). Flexibility is allowed in terms of switching between machines, methods, and resolving problems in production. Depending on the nature of business, each of the workers hired may need to possess a certain range of skills to handle different tasks or machines, whereas the total number of workers may be adjusted in response to the varying demand. In practice, transferability of permanent workers and recruitment of temporary or contract workers will help make such adjustment feasible, thus admitting of the idea of WOZIP.

VI. Analysis and Discussion

Table 1 illustrates the age, gender, marital status and education level frequencies of the participants. It's seen in table that 21-24 age groups of participants have the highest frequency. This group is followed by the 20 and under 20 age group of participants. While the 29 and above age group of participants is in third place, on the other hand, the 25 to 28 age group of participants is in last place. Tourism firms generally prefer a young workforce and university students prefer the work in the sector, thus the 21-24 age groups of participants is high. The table also shows that the number of the male participants is higher than the number of female participants.

Table 1. Demographic characteristics of participants

Age	***f***	***%***		***Educational Level***	***f***	***%***
20 and under	89	23,2		Primary School	26	6,8
21-24	160	41,8		High School	62	16,2
25-28	42	11,0		Bachelor Degree	282	73,6
29 and above	92	24,0		Graduated Degree	13	3,4
Total	383	100		Total	383	100
Gender	***f***	***%***		***Marital Status***	***f***	***%***
Male	229	59,8		Single	305	79,6
Female	154	40,2		Married	78	20,4
Total	383	100		Total	383	100

It is seen in the Table 1 that single participants are ranked first and married participants are ranked second. As discussed above, tourism firms prefer a younger workforce; therefore the number of single participants is high. In addition, a young and unmarried workforce is a plus for the tourism sector because young personnel are more inclined towards new ideas and innovation.

It is recognized that most of the participants (% 73.6) have bachelor degree. % 16.2 of the participants has high school degree. As in other economics sectors, the tourism sector is in need of qualified personnel. Hence, tourism firms want to recruit personnel who have at least a bachelor degree level of education.

Statements were subjected to factor analysis in order to find the dimensions of knowledge transfer and networks with technology and innovation. As a result of the factor analysis statements related to technology and innovation were gathered in one dimension. Considering including statements this dimension has been named as 'Technology and Innovation'. The explaining ratio of the obtained dimension is 57.35, and this ratio is above the acceptable threshold value. The Cronbach Alpha value that employed for the internal consistency of technology and innovation dimension is 0.850, and this value indicates that the scale of technology and innovation is reliable. After the removal of the statement related to knowledge transfer and networks of 'actors in the regions usually share their knowledge and experience with other countries', a factor analysis was performed to reduce the statements about the scale of knowledge transfer and networks. As a result of factor analysis four dimensions were obtained about knowledge transfer and networks. Considering including statements this dimensions has been named as 'Knowledge Transfer', 'Knowledge Sharing', 'Networks' and 'Collaboration'. Explaining ratio of the obtained dimension is 63.23, and this ratio is above the acceptable threshold value. The Cronbach Alpha value employed for the internal consistency of knowledge transfer and networks dimensions are between 0.746 and 0.809 and these values indicate that scale of knowledge transfer and networks is reliable.

Correlation analyses were performed between 'Technology and Innovation' dimension and respectively 'Knowledge Transfer', 'Knowledge Sharing', 'Networks' and 'Collaboration'. Table 2 summarizes the results of correlation analyses.

Table 2. The relationship between technology and innovation with knowledge sharing and networks

		Knowledge Transfer	Networks	Collaboration	Knowledge Sharing
Technology and Innovation	Pearson Correlation	,495**	,539**	,396**	,486**
	Significant	,000	,000	,000	,000

**. Correlation is significant at the 0.01 level

According to the results it can be concluded that as the level of knowledge transfer, knowledge sharing and collaboration increase among tourism firms, the level of technology and innovation in tourism industry will be increase.

Firms need national and international networks to transfer knowledge and to share knowledge. The results show that networks among the tourism firms increase the level of technology and innovation. Thus, firms need to add innovation and technological policies to their strategic plans.

VII. Conclusion

A firm can expand its existing market share and increase its competitive advantages by innovation activities. Firms should follow a certain process to innovate. Firstly, affirm should take an opportunity by internal and external creative ideas. After this step, a firm should gather various resources and knowledge to turn these ideas into reality. This knowledge can be obtained through knowledge transfer channels such as universities, personnel and local authorities. After obtaining the necessary knowledge, solutions should be developed and new product/service or process should be executed. Firms may want to innovate for a variety of reasons. For instance, firms that want to increase their market share need innovation in order to expand their existing range of product and services and to offer new products to the market. Furthermore, firms may want to innovate to increase service quality, to reduce the cost of energy bills, increase delivery time and increase knowledge transfer.

The tourism firms operating in Antalya Province prefer a younger workforce. Results show that in the majority of tourism firms the workforce consists of workers whose ages are between 21-24. Tourism related graduates of universities prefer to go into the tourism industry. According to the results, tourism firms operating in the Antalya Province mostly prefer to recruit personnel who have a bachelor degree.

According to the results of the correlation analysis it can be concluded that there is a significant relationship between knowledge transfer and networks with technology and innovation. As mentioned above, creating networks between tourism firms operating in Antalya Province and transferring knowledge form other tourism regions will enhance the level of technology and innovation activities of the tourism firms in the Antalya Region. For that reason, strategic management plan of hotel firms should contain actions that expanding national and international networks of hotel firm.

A functional structure made up of holons is called holarchy. The holons, in coordination with the local environment, function as autonomous wholes in supra-ordination to their parts, while as dependent parts in subordination to their higher level controllers. When setting up the WOZIP, holonic attributes such as autonomy and cooperation must have been integrated into its relevant components. The computational scheme for WOZIP is novel as it makes use of several manufacturing parameters: utilisation, disturbance, and idleness. These variables were at first separately forecasted by means of exponential smoothing, and then conjointly formulated with two constant parameters, namely the number of machines and their maximum utilisation. As validated through mock-up data analysis, the practicability of WOZIP is encouraging and promising.

Suggested future works include developing a software package to facilitate the WOZIP data input and conversion processes, exploring the use of WOZIP in the other forms of labour-intensive manufacturing (e.g. flow-line production and work-cell assembly), and attaching a costing framework to determine the specific cost of each resource or to help minimise the aggregate cost of production.

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