

# Tecnologías de información y transferencia de conocimiento en pymes turísticas del Departamento de Caldas

SYSTEM ENGINEERING

## Information technologies and knowledge transfer in tourism SMEs in the Department of Caldas

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### Abstract

The interest of this article is the presentation of the findings of the relationship found between knowledge transfer and information and communication technologies, of the SMEs of the tourism sector of the Department of Caldas. The study is based on the application of a knowledge management valuation model to 61 operating companies of the tourism sector in the Department of Caldas. Based on a qualitative research, with a descriptive approach (use of surveys), exploratory (use of observation and documentary review) and correlational (multivariate analysis). Regarding the use of ICT, it is a palpable fact, the progress of SMEs in the tourism sector of the Department of Caldas in the use of this resource as a basis for the sale of services, products and the transfer of knowledge inside and outside the companies, which can be seen in the different portals and mobile applications that these companies have. It is concluded that there is a positive and significant correlation between knowledge transfer and information and

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communication technologies. It is hoped that these results will lead to strategies that allow the improvement of these companies.

**Keywords:** *Knowledge transfer, Tourism, Information and communication technologies.*

## Resumen

El interés del presente artículo es la presentación de los hallazgos de la relación encontrada entre la transferencia de conocimiento y las tecnologías de información y comunicaciones, de las pymes del sector turístico del Departamento de Caldas. El estudio parte de la aplicación de un modelo de valoración de gestión del conocimiento, a 61 compañías operadoras del sector turístico del Departamento de Caldas. Partiendo de una investigación cualitativa, con un enfoque descriptivo (uso de encuestas), exploratorio (uso de observación y revisión documental) y correlacional (análisis multivariado). En cuanto al uso de TIC, es un hecho palpable, el avance de las pymes del sector turístico del Departamento de Caldas en el uso de este recurso como fundamento de la venta de servicios, productos y la transferencia de conocimiento al interior y exterior de las empresas, lo que se puede ver en los diferentes portales y aplicaciones móviles que tienen estas empresas. Se concluye que existe una positiva y significativa correlación entre la transferencia de conocimiento y las tecnologías de información y comunicaciones. Se espera con estos resultados se planteen estrategias que permitan el mejoramiento de estas compañías.

**Palabras clave:** *Transferencia de conocimiento, Turismo, Tecnologías de información y comunicaciones.*

## 1. Introduction

The evolution of the world economy makes it possible to consider that the tourism sector will become an important bastion of development in the different regions of the world and Colombia, for which important initiatives are being generated to consolidate this economic sector from the public and private sectors, given the potential and the significant number of jobs that this sector can create and the resources that can be used. This sector needs to consolidate its processes and technological infrastructure as a conditioning factor to develop the transfer of knowledge.

Knowledge transfer is based on knowledge management (KM), which according to Guzman et al.,<sup>(1)</sup> focuses on the use of intellectual capital within companies based on the capabilities of employees to reward society, and seek the progress of the processes of organizations.

Now, DelChiappa et al.<sup>(2)</sup> argue that, in recent decades, Information and Communication

Technologies (ICT) have radically and unpredictably changed our society, as with travel tourism which is one of the sectors that has been most transformed, especially since the Internet emerged, making available to users a multidimensional system and creating the concepts of digitization and business ecosystems. A tourist destination on the Internet requires a technological infrastructure, cooperation, knowledge sharing and innovation.

In the case of the Department of Caldas (Colombia) there are SMEs that act as tourism service providers in the department, and focus on gastronomy and bar services, accommodation and lodging, transportation, tour guides and travel and tourism agencies. These companies are used to answer the following research question: Is there a relationship between knowledge transfer and ICT in SMEs in the tourism sector in Caldas?

This makes it necessary to propose the following research objective: to identify the relationship between knowledge transfer and ICT in SMEs in the tourism sector of the department of Caldas.

This objective will allow companies to maintain competitiveness levels in order to remain in the market, face competition and ensure future growth.

### 1.1. Knowledge transfer

That knowledge is one of the most critical resources for generating sustained competitive advantage in organizations <sup>(3)</sup>. For a resource to have the potential for sustainable competitive advantage, it has to be valuable, rare, imperfectly imitable and non-substitutable. KM involves the management and organization of the stakeholders of a given organization, with the goal of achieving success; with this approach, the main objective is to create new knowledge <sup>(4)</sup>. Knowledge flows are an important element in the performance, competitiveness and innovation of tourism organizations, knowledge can flow through transfer <sup>(5)</sup>.

In this framework, Duryan et al. <sup>(6)</sup> explain that in organizational management knowledge transfer (KT) is considered as a combination of framed experience, values, information from the context and from knowledgeable people that provides a framework for valuing and aggregating experiences and information. It is created and realized in the minds of knowledgeable people. And in companies, it is regularly expressed in documents or repositories, and also in procedures, processes, practices and regulations.

It can be defined as a process <sup>(7)</sup>, whereby one unit (e.g., division, department, or section) is affected by the experience of another. Knowledge can be transferred through socialization processes, education, and learning. Knowledge transfer leads to knowledge integration and there are a variety of mechanisms that can support its development such as instructions, procedures, communities of

practice, instructional videos, narratives, storytelling and online forums, among others.

Another approach is given by Gómez et al., <sup>(8)</sup>, who explain KT is understood as the component that makes it possible for knowledge to be fully available and ready to be shared among the employees of a company. This makes it easier for these individuals to consider themselves at some moments as receivers and at others as disseminators; since, by integrating the transferred knowledge effectively, they will be able to use it according to their requirements.

Another aspect is considered by Giuri et al., <sup>(9)</sup>, who define KT as a complex and rapidly evolving phenomenon based on the interactions of various stakeholders and refers to the multiple ways in which firms' knowledge can be exploited to generate economic and social value and industry development. It is possible to identify at least four interconnected domains, namely: 1) deciding the strategic orientation of firms towards knowledge transfer activities; 2) defining the specific objectives that knowledge transfer aims to achieve to serve the firms' strategy; 3) identifying the structure to manage those objectives; and 4) evaluating the performance of knowledge transfer operations.

KT is a process that plays a fundamental role in business success. It can be understood as the transfer of knowledge from one place, person or property to another. When people are willing to transfer and exchange knowledge they can instigate collective learning, synergy and develop creativity and innovative ideas. When employee motivation, knowledge sharing and knowledge transfer are established, product and process innovations are enhanced <sup>(10-11)</sup>.

Complement Hyeyoung et al., <sup>(12)</sup>, KT has become an important organizational management process because it benefits an organization by obtaining new knowledge from one or more sources. It is a one-way process from a provider to a recipient. It

is important not only for identifying, sharing, and applying valuable knowledge within an organization, but also for considering the implications of knowledge obtained outside the organization.

KT in an organization is a concept that has its own form, since it is possible to know the flow of internal and external knowledge. Therefore, KT is a dyadic reciprocity in which a receiver is impacted by the experience and knowledge of a source. Knowledge is transferred when the store of knowledge (located in a human being, in a tool, or in a skill/technique or a group of such elements) is transferred from one group to another or when the knowledge of the receiver is modified<sup>(13)</sup>.

The literature review highlights the research work of<sup>(21)</sup>, who analyzed the bases of a model for managing technology transfer in a region, focused on the impact on the development and strategic objectives of the region, the productive system and the scientific and technological system.

## **1.2. ICT in KM**

The advance of ICT has generated a change in the structure of the productive and social sphere of humanity today; its use has caused a revolution that has changed the way of producing, recording, disseminating and using information in the modern world; seeking to generate economic, political and social development in a global economy. Of the advantages created by ICT, we can mention productivity increases as a result of improving processes, or the creation of value for both customers and employees of the company and the creation of advantage over competitors. ICT also considers the collective means of gathering and storing, transmitting, processing and retrieving words, phrases, sentences, numbers, images, videos and sounds, as well as the electronic means of controlling devices of all

kinds, from household appliances to robotic machines and processes.

Likewise, Ocaña et al.,<sup>(4)</sup> determined that ICT have generated an enormous change in generations, in the cultural and educational spheres, since their impact is possibly one of the greatest changes in any field. The urgent need to appropriate the use of ICT goes beyond their use, since it is necessary to have a kind of digital literacy that can address new learning that goes hand in hand with ICT<sup>(14)</sup>.

Complement Pandey et al.,<sup>(15)</sup> explaining that ICT are one such fundamental resource for many KM initiatives. ICT, as a facilitator, has also been effective in reducing barriers (physical distance, time distance, and social distance) to knowledge sharing. A potential long-term role it plays for the organization is in enhancing innovation. Invariably, ICT has an immovable role in all KM processes, including acquisition, creation, documentation, transfer and application of knowledge.

In this line Guzmán et al.,<sup>(1)</sup> assume that ICT are tools that help or improve the development of organizational processes as they make possible the execution of activities in a more efficient way. KT can be observed in the knowledge that people bring to companies. This includes the use of technology as a factor to apply it favoring its performance from the integration of experts in a subject to solve specific problems. It is evident that ICT become facilitators for KM and can make possible the development of employees' competencies, since the results show that they are important for the improvement of performance in their jobs. The use of ICT makes it easier for companies to achieve efficiency in their processes and thus become more competitive in the sector to which they belong.

## **1.3. Tourism sector of the Department of Caldas**

Tourism is an economic activity in which people travel for some purpose and this includes all aspects of travel; the industry is also known as the travel and tourism industry and includes the sub-sectors: accommodation, adventure and recreation, attractions, events and conferences, food and beverage, tourism services and transportation, and travel trade.

The tourism industry is important for the benefits it brings and for its role as a commercial activity that creates demand and allows the growth of other industries, tourism not only contributes to more economic activities, but also generates more employment, income and plays an important role in local and territorial development.

According to, Cámara de Comercio de Manizales <sup>(16)</sup>, the tourism sector in the Department of Caldas is characterized by the fact that of the total number of tourism service providers in the Department of Caldas, 67% are gastronomic establishments and bars, 21% accommodation and lodging establishments, 5% transportation companies, 5% tour guides and the remaining 2% travel and tourism agencies. 84% of the tourist service providers do not speak a second language, which is a very high and worrying figure, especially in the context of globalization, free trade agreements and the declaration of the Coffee Cultural Landscape as a cultural heritage of humanity by UNESCO.

## 2. Methodology

For the development of the research project that supports the results presented in this article, the work of Marulanda et al., <sup>(17)</sup>, who developed a KM evaluation model, considering a systemic approach, which is determined by its holistic and integrative approach, also from its process management approach, was considered for the development of the research project, on the basis of this model, which was adapted for the research

project, a validation process was conducted in SMEs tourism operators in the Department of Caldas, Colombia. A basic taxonomy was defined as follows: four dimensions were considered, which relate their components, such as: the infrastructure dimension, which contains the categories organizational culture, ICT and knowledge life cycle; the CoPs communities of practice dimension, which considers the categories personal competences and social relations; the intensive use of knowledge dimension, which includes the categories mission processes, strategic processes and support processes; and the organization dimension. Thus, in an integral framework, the aim is to evaluate an organization considering the dimensions and categories mentioned, understanding the interaction between them and considering that they are the organizational foundations of an adequate KM, as shown in Figure 1.

The research project, which is the basis for the results presented, is based on qualitative research, in addition to using a descriptive and correlational approach, starting with the construction of the model and its validation. The starting point is then a quality, from the perception of the businessmen, related to the variables to be evaluated and this quality is taken to a specific value, which, being a number, can be treated in a statistical analysis, considering the type of variables, according to the software used. The categories are related to the life cycle of knowledge, ICT, organizational culture, strategic processes, mission processes, support processes, personal competencies and social relations. In addition, considering the dynamics of the specific research context, research experience and specific information needs, the following categories considered key for the tourism sector were added to the evaluation model:

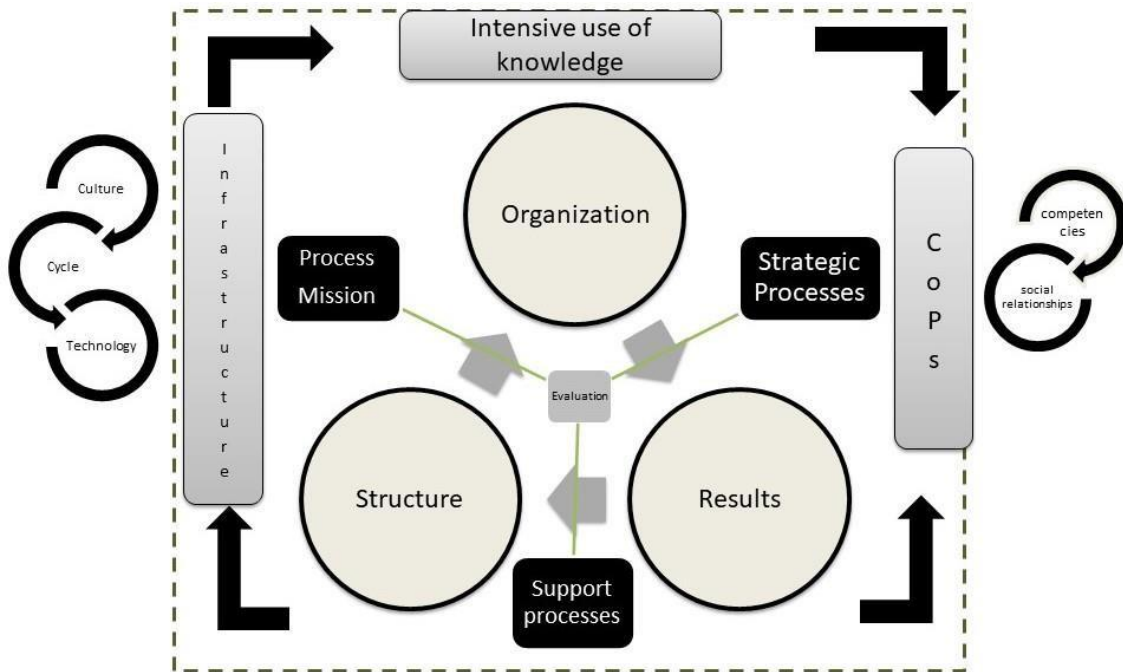


Figure 1. Evaluation model. Source: Adapted from: <sup>(17)</sup>

Structure: understood as the support of the SMEs related to the basic characteristics of the employees working in them, the collaborators in the provision of tourism services.

Results: are those related to customer and stakeholder orientation, in order to enhance tourism services through experiences and service management.

The likert measurement scale was used for the measurement, with a range from 1 to 5, where: not performed (1), partially performed (2), performed at intervals (3), performed regularly (4), and fully performed (5).

Now, the economic sector of the study in which the model presented was applied and contrasted corresponds to the SMEs in the tourism sector of the Department of Caldas, Colombia. To obtain the data, the number of SMEs was identified, from which were selected those whose main mission was the tourism operation, which made it possible to establish a total population of 70

companies in the region, to which the survey was applied in its entirety and of them, only 61 responded, which means a participation in the study of 87% of the population.

For this purpose, a general survey was applied, from which the questions related to the categories to be evaluated are considered:

ICT category

Are computers and software available to support CT?

Are management models such as ISO, EFQM, JIT, KANBAN, etc. used?

Are collaborative work environments or knowledge engineering tools available for CT?

Knowledge transfer category

Is customer orientation part of day-to-day business?

Are customer loyalty processes developed?

Are there any alliances, agreements or arrangements with other entities?

Is there a corporate social responsibility program?

### 3. Results

Considering the model as a whole and the specific survey questions mentioned in the methodology, only the knowledge transfer and ICT categories are addressed for the presentation of the results. The following are the findings related to the

categories and variables evaluated, considering from the KT, the components related to client and stakeholder orientation (ORI), client loyalty (FID), agreements established with companies in the sector or other organizations (CONV) and corporate social responsibility (CSR) and ICT, considered as fundamental tools for knowledge transfer and whose components are related to basic technologies (BAS), ICT-based methods (MET) and knowledge technologies (TECNK). The assessment was carried out based on the survey that supports the KM evaluation model and the results can be seen in Figure 2.

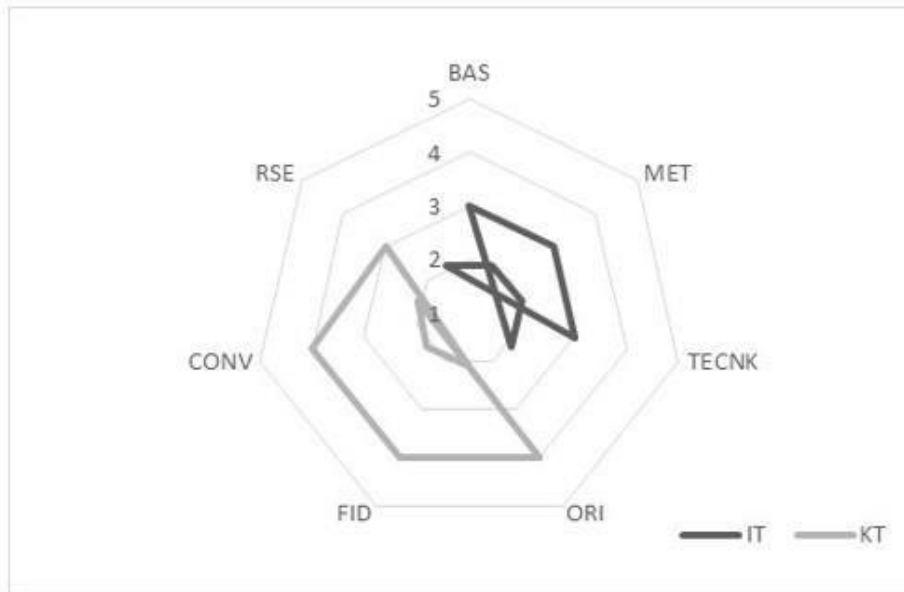


Figure 2. KM cycle and processes Source: Own elaboration

Figure 2 shows the results of the evaluation relating the variables used to measure the transfer of knowledge and ICT. However, as regards the transfer of knowledge, the variables customer and stakeholder orientation (ORI) and corporate social responsibility (CSR) were rated with 3. This can be explained by the efforts being made by these types of companies to redefine the value of the client in their work and to relate much more with public and private stakeholders, given the interest of clients in obtaining more and better

individual tourism services and business packages; In the case of CSR, there has been significant progress in its business significance and the care of resources, from a sustainable and sustainable perspective, considering the economic sector to which the companies evaluated belong and the need to coexist harmoniously with nature, as well as the progress in the development of these concepts for the proper functioning of the companies and the context in which they provide their services.

In relation to customer loyalty (FID) and agreements established with companies in the sector or other organizations (CONV), they were rated 4.0, that is, carried out regularly, which shows an important level of maturity in getting customers to recognize these companies as part of a social fabric and as a provider of services that are fundamental and appropriate for them, in this case also, the various programs that are being accompanied from the local, regional and national governments, to achieve the incorporation of vulnerable people in business development as is currently being sought, the inclusion of mothers heads of household. It also shows that valuable efforts are being made to reach agreements with various companies and organizations in the region and the country to sell their services.

Regarding the variables related to ICT, such as basic technologies (BAS), ICT-based methods (MET) and knowledge technologies (TECNK) were rated with 3.0 i.e., performed in some time intervals, which can be explained considering the various technological advances of the regions of

the Department of Caldas, which like many others in Colombia, do not have an adequate infrastructure or sufficient and appropriate technologies to move forward with the sale of their services from IT, and in this case it is clear that there is a lack of development of free wifi infrastructure, which is recognized by the national government and is working on programs of free access to the internet network in some points of the municipalities where the companies are located.

The above results show a positive line of what is happening with the transfer of knowledge and the use of ICTs by SMEs in the tourism sector of the Department of Caldas, and although there is still a long way to go, the companies evaluated are on the right track. Now, to validate this statement, the statistical technique of correlation was used, which allows finding the level of significance between the two categories, ICT and knowledge transfer, from each of the variables that compose them. The results of this correlation can be seen in Table 1.

**Table 1.** Correlations of variables

	ASOCIAR	DINAM	INFCO	GCI	ESTR	VIGI	JURID	STAK
ASOCIAR	1							
DINAM	,382**	1						
INFCO	,438**	,677**	1					
GCI	,512**	,425**	,506**	1				
ESTR	,401**	,449**	,590**	,538**	1			
VIGI	,552**	,150	,465**	,676**	,362**	1		
JURID	-,062	,306**	,458**	,305**	,587**	,155	1	
STAK	,327**	,402**	,573**	,661**	,492**	,539**	,424**	1

*Positive and significant values are shown in yellow*

*Source: Own elaboration*



The findings presented in Table 2, show, how at least 30% of the results are significant, i.e., these data explain that there is a significant correlation between ICT and knowledge transfer in SMEs in the tourism sector of the Department of Caldas. These records agree with research results such as those of Miković et al., <sup>(18)</sup>, who concluded that the structural dimensions of ICT, are the key factors to facilitate knowledge sharing, and constitute the core of knowledge management practice.

In addition to that concluded by Bagheri et al., <sup>(19)</sup>, who explain that KT between actors allows a better understanding of customer needs, which in turn leads to better integration and knowledge transfer, all supported by ICT. Or what was found by Hamdoun et al., <sup>(10)</sup>, who demonstrated that a company's practices stimulate its ability to transfer knowledge and in this framework need to consider ICT as useful and supportive tools <sup>(20)</sup>.

Likewise, the findings of Ocaña <sup>(4)</sup>, who determined that there is a significant and positive relationship between KM and ICT due to the Spearman correlation coefficient, with a very strong positive correlation, so it can be inferred that the greater the application of KM processes, the greater the application of ICT. Similarly, a significant and positive relationship was obtained between knowledge transfer and ICT, with a positive Spearman correlation coefficient, and it can be inferred that if knowledge generation processes are strengthened, the greater the application of ICT will be. Finally, the significant and positive relationship between knowledge transfer and IT was determined, which indicated a considerable positive correlation, and supports that, if better knowledge transfer procedures are established, the application of ICT will be more optimal.

Based on the above results, new scenarios open up to determine how to improve and develop a greater transfer of knowledge in SMEs and how

this can be achieved from the same model, another context, other categories or other variables.

#### 4. Conclusions

The regional and local economy, in this case, in the department of Caldas, Colombia, has its fundamental basis in the agricultural and agribusiness development and in a business dynamic from various productive sectors and of course the service sector which, in the case of the findings presented, represent the SMEs of the tourism sector and contribute an important advance to the improvement of the lives of citizens. A sector that has a great present and future for the development of the country's economy, since Colombia is a reference in the sites to be visited by international tourists, given the worldwide recognition of, for example, the coffee cultural landscape and the natural beauties it has and in which several groups of interest converge that require accompanying its growth and consolidation.

Within the framework of knowledge transfer, it is highlighted that SMEs in the tourism sector of the Department of Caldas are making efforts to redefine the value of the client in their work and relate much more with public and private stakeholders, given the interest of customers to obtain more and better individual tourism services and business packages; considering the care of resources, from a sustainable and sustainable perspective, as well as the need to coexist harmoniously with nature.

Regarding the use of ICT, there are difficulties typical of a developing country like Colombia, related to its use and appropriation, but it is a palpable fact, the progress of SMEs in the tourism sector of the Department of Caldas in the use of this resource as a basis for the sale of services, products and knowledge transfer inside and

outside the companies, which can be seen in the different portals and mobile applications that these companies have.

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