

Towards a model to measure the efficiency of inter-organizational knowledge transfer for tourism destinations

Hossein Raisi^a, Kourosh Esfandiar^{a,*}, Llandis Barratt-Pugh^b, Gregory Willson^a, Rodolfo Baggio^c

^a School of Business and Law, Edith Cowan University, Joondalup, WA 6027, Australia

^b University of Western Australia (PhD) Honorary Research Fellow, Nargarkot, 5 Chancellor Street, Claremont, WA 6010, Australia

^c Master in Economics and Tourism and Donde Center for Research on Social Dynamics and Public Policy, Bocconi University, Milan, Italy

ARTICLE INFO

Keywords:

Knowledge transfer
Knowledge management
Tourism destination
Conceptual model
Network structure
Social capital

ABSTRACT

Tourism industry relies on destination-level knowledge transfer for innovation and competitiveness, yet slow adoption of knowledge management practices hinders the potential benefits. Academic studies on knowledge transfer and its efficiency are limited and very few have addressed this phenomenon at inter-organizational level particularly in a tourism destination context. We aim to address this gap by providing a conceptual model to extend research knowledge in this area. Drawing on social capital theory and knowledge management constructs, the model incorporates four pivotal dimensions: 'structural,' 'relational,' 'organizational,' and 'knowledge' properties, identified as effective antecedents of knowledge transfer through prior research. The proposed model is designed to be practically applicable and measurable in a tourism destination and includes a measurement approach based on a network perspective. The benefits of using such a model include a comparison between destinations, and the opportunity to illuminate the restraints within a specific destination for subsequent strategic management action.

1. Introduction

"In an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge" (Nonaka, 2008, p. 162).

The notion that *knowledge* is the primary source of competitive advantage has been widely recognized for over three decades (Conner & Prahalad, 1996; Martinkenaite, 2011; Rastegar & Ruhanen, 2021; Rehman et al., 2022). The 'knowledge-based' view of a firm, which combines 'organizational learning' and 'resources-based view' of the firm emphasizes essential role of knowledge-based resources in achieving sustainable competitive advantage (Abdollahi et al., 2023; Banmairuoy et al., 2022; Novotny et al., 2024). This is because the sustainability of competitive advantage depends on "the imitability of the capabilities which underlie the advantage" (Grant, 1996, p. 117), and those knowledge-based resources are often difficult to replicate (Lawson & Potter, 2012). This is particularly relevant in the tourism sector, where destinations act as the main competitive units, requiring effective stakeholder collaboration within business clusters. These

clusters, through the integration of various stakeholder inputs, enhance competitiveness and innovation (Perkins et al., 2021; Perkins et al., 2022; Ubada-Garcia et al., 2021) necessitating proper knowledge for sustained competitiveness, enhanced performance, and innovation (Cooper, 2018; Van Der Zee & Vanneste, 2015).

Organizations typically generate new knowledge either through their research and development (R&D) sections or by transferring knowledge from external sources (Fang et al., 2013). However, most new knowledge sources lie beyond the traditional borders of organizations (Lawson & Potter, 2012). "Firms no longer innovate in isolation but through a complex set of interactions with external actors" (Huggins & Johnston, 2010, p. 459). Chen et al. (2022) suggest that industrial clusters should emphasize strengthening external innovation partnerships and enhancing credit network externalities as crucial elements for achieving success. This will facilitate the exchange of knowledge, expertise, and resources, fostering an environment conducive to innovation and efficiency. Furthermore, Kim and Shim (2018) underscore the significance of knowledge transfer among SMEs in a tourism network, contributing to the innovation through which, a group of SMEs

* Corresponding author.

E-mail address: k.esfandiar@ecu.edu.au (K. Esfandiar).

<https://doi.org/10.1016/j.tmp.2024.101282>

Received 6 August 2023; Received in revised form 23 May 2024; Accepted 27 June 2024

2211-9736/© 2024 The Author(s). Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

can enhance their global competitiveness by fostering local cooperation, thereby reaping diverse benefits as noted by [Soteriades \(2012\)](#). This highlights the pivotal role of knowledge transfer as a crucial intermediary in shaping the impact of organizational structure on innovation performance ([Lopes et al., 2021](#); [Swanson et al., 2020](#)).

However, small and medium enterprises (SMEs) in tourism sectors, often lack internal R&D capacity and encounter challenges in generating externalities within the cluster ([Durst & Runar Edvardsson, 2012](#); [Perles-Ribes et al., 2017](#)). This issue becomes more pronounced at the destination level, where destinations serve as the main competitive units. A tourism destination is described as loosely connected enterprises, governments and other organizations working together towards the shared goal of ensuring both the competitiveness and sustainability of the destination ([Scott et al., 2008](#)). Various organizations collaborate at this level to ensure the competitiveness and sustainability of the destination ([Esfandiar, Bapiri, & Kuhzady, 2024](#); [McTiernan et al., 2021](#)). [Perkins et al. \(2022\)](#) emphasized this in their empirical study, analyzing stakeholder interactions within local tourism businesses, councils, and regional tourism organizations. Their findings show how different stakeholder typologies and networks aid cluster formation. This means these complexities require dedicated support structures and collaborative strategies within clusters to enable effective knowledge transfer and shared R&D efforts. Such initiatives could significantly boost the innovation capacity and competitiveness of clusters, allowing all members, especially SMEs, to fully engage and reap collective benefits.

Innovation is essential for destination competitiveness; effective knowledge transfer is crucial for fostering innovation and sustaining competitive advantage ([Czernek, 2014](#); [Swanson et al., 2020](#)). However, knowledge transfer, a critical phase in knowledge management (KM), is a challenging and complex process that requires significant efforts and resources to achieve ([Argote & Ingram, 2000](#); [Fang et al., 2013](#)). This aspect is particularly significant at the inter-organizational level, contrasting with interpersonal and intra-organizational levels, which occur within individual organizations ([Zehrer, 2011](#)). Facilitating and optimizing inter-organizational knowledge transfer is complicated, due to differences in organizational boundaries, cultures, and routines ([East-erby-Smith et al., 2008](#); [Martinkenaite, 2011](#)). Thus, measuring knowledge transfer efficiency in tourism destinations and addressing complexities of knowledge transfer and innovation in this industry at inter-organizational level is of a critical value, which are the objectives of this study.

In tourism research, knowledge management has received limited attention ([Novotny et al., 2024](#); [Raisi et al., 2024](#); [Ritsri & Meeprom, 2020](#)) and as highlighted by [Anand et al. \(2023\)](#) and [Fauzi \(2023\)](#) in their recent systematic review, requires more attention. Tourism has been late and slow to adopt KM practices and thus, largely failed to realize and capture its benefits ([Cooper, 2015, 2018](#)). Among the existing studies, very few have addressed knowledge transfer at inter-organizational level; and to the authors' knowledge no study has taken a comprehensive view in examining the knowledge flow within a tourism destination. Also, this paper integrates knowledge transfer and networks to analyze inter-organizational knowledge flow at the destination level. Given the inherently networked structure of the tourism industry, characterized by intricate networks of interdependent operators constantly exchanging contextually generated knowledge ([Scott et al., 2008](#)), it is imperative to integrate knowledge transfer and networks. However, previous research lacks a combined approach for measuring and analyzing these aspects at the destination level.

[Cooper \(2018\)](#) asserts that current understanding of knowledge flows in tourism destinations is incomplete, indicating a gap in academic and managerial comprehension. Consequently, this study aims to address these gaps by arguing for and developing a model to investigate the knowledge transfer efficiency within a destination. This paper responds to this question: What framework and measurement approach can be proposed to analyze the efficiency of inter-organizational

knowledge flow at the destination level, integrating knowledge transfer components and network structure to provide a comprehensive understanding of these aspects? Specifically, by responding to this question, we will justify why existing knowledge in specific research domains are applicable to this particular application, what causal relations and proposition about relationships specified in the literature should form a part of the model, what modes of measurement established in related domains are applicable for tourism destinations and why the components of the model as related in the final detailed road-map that constitute the model.

Through this thorough analysis, we strive to enhance the current body of knowledge, shedding light on the nuances of these antecedents in the context of knowledge transfer in tourism destinations. The remaining sections include a comprehensive literature review on knowledge and knowledge transfer in tourism, followed by the methodology. The paper will present a detailed conceptual model and propose a measurement approach for assessing knowledge transfer efficiency. It will conclude with implications and limitations of the study.

2. Literature review

The ambiguity in defining knowledge and knowledge transfer significantly influences their measurement and understanding within research and practice. In the following paragraphs, we discuss and try to clarify how we define knowledge and knowledge transfer in this paper.

2.1. Knowledge

Defining knowledge is a complex task due to its multifaceted nature and the diverse perspectives from which it is approached ([Fochler, 2016](#)). As knowledge has evolved into an economic commodity, it has become the focal point of various disciplines, each offering distinct viewpoints and ambitions ([Birch & Cumbers, 2010](#)). This shift has led to the recognition of knowledge as an asset and commodity, driving economic activities and influencing global competitiveness ([Fang et al., 2013](#)). However, despite lacking consensus on the definition of knowledge, its definition is significant because it can influence the way knowledge is managed ([Alavi & Kane, 2008](#)).

The central argument that underpins definitions of knowledge is whether knowledge can exist independently of the knower, as an object, or if knowledge and knower are inseparable ([Edwards, 2015](#)). The first perspective views knowledge as an external 'object' separable from the knower, which leads to the knowledge management approach of managing things. This view takes an objectivist approach in terms of epistemology and was supported by the first generation of KM ([Spender, 2015](#)). The second perspective is supported by the second generation of KM who emphasized the role of human knower, contending that knowledge cannot be conceived as separable from the knower. This view leads to the challenge of managing people ([Edwards, 2015](#)).

In an alternative conceptualization of knowledge, [Alavi and Leidner \(2001\)](#) proposed five perspectives for conceptualizing knowledge in their work: (1) as a state of mind (a state or fact of knowing), (2) as an object, (3) as a process (of simultaneously knowing and acting), (4) as a condition of having access to information, and (5) as a capability. Adopting each of these perspectives leads to different perceptions of what knowledge is and how it can be managed and measured. When knowledge is seen as a finite discrete substance, KM activities will be centralized on the storage and organizing the knowledge. In contrast, if it is viewed as a process or flow, management activity will be focused more on developing effective knowledge management processes ([Alavi & Kane, 2008](#)).

Social network researchers adopt the embedded perspective of knowledge where knowledge does not have a discrete identity of its own as an object, rather it must be understood and assessed in relation to the social context and social actors producing and receiving the knowledge

(Alavi & Kane, 2008). The embedded view suggests that knowledge is embedded in individuals' minds, in their relationships, also in relationships between individuals and artifacts (Alavi & Kane, 2008). Knowledge is therefore essentially a social process, and is seen as belonging not only to a knower but to a community of 'knowers' (Edwards, 2015; Lopes et al., 2021).

Considering the inherently networked nature of tourism industry (Bapiri et al., 2024; Scott et al., 2008), adopting a similar perspective to knowledge as that taken by social network researchers will be the most relevant and useful perspective for this exploration. The rationale for this approach is that social network researchers perceive knowledge as a phenomenon that is embedded within organizations, and their network of relationships and interactions. This perspective reflects the nature of the tourism industry, which consists of complex networks of inter-dependent operators and continually transferring knowledge that has been generated in their contexts (Fauzi, 2023). Therefore, viewing knowledge as a process or flow is an appropriate focus on knowledge transfer in the tourism industry.

2.2. Knowledge transfer

Alavi and Leidner (2001) identify four basic knowledge processes within organizations: creation, storage, transfer and application. Knowledge transfer is an important knowledge management activity for organizations (Anand et al., 2023; Valeri & Baggio, 2021). The aim of knowledge transfer is to effectively transmit knowledge from the source to the recipient. Its success is gauged by the frequency of knowledge exchanges over a specific timeframe and the extent to which the recipient comprehends and internalizes the knowledge, leading to ownership, commitment, and satisfaction (Cummings & Teng, 2003; García-Almeida & Cruz, 2020).

Knowledge transfer should also be distinguished from 'knowledge sharing' and 'knowledge exchange'. Despite similarities, distinctions exist between the terms often used interchangeably. Knowledge transfer involves both knowledge sharing by the sharer and the receiver's acquisition and application of the knowledge (Wang & Noe, 2010). Knowledge sharing primarily emphasizes the knowledge source, offering an incomplete view of knowledge transfer (Cavallari, 2013). In contrast, knowledge exchange encompasses both sharing and seeking knowledge (Wang & Noe, 2010). Another differentiation lies in the levels of analysis, with knowledge sharing at the individual level and knowledge transfer at group, organizational, or business levels (Paulin & Suneson, 2012). This study defines knowledge transfer as the comprehensive process involving the transfer of knowledge from source to recipient.

The levels at which knowledge is transferred have a significant impact on how the knowledge is subsequently analyzed and used. The transfer of knowledge can normally be classified into three levels: interpersonal, intra-organizational and inter-organizational (Phelps et al., 2012). Inter-organizational knowledge transfer is a process whereby organizations learn from each other's expertise and knowledge to enhance competitiveness. (Martinkenaite, 2011, p. 54). Organizations, as open systems that depend on the health of their external relations, need to acquire new knowledge to survive (Van Wijk et al., 2008). They can enhance their knowledge bases and innovative capabilities by transferring knowledge and skills from other organizations (Easterby-Smith et al., 2008; Swanson et al., 2020). In tourism, destinations are the real competitive units; competition at inter-organizational level (macro level) is more important than competition between individual businesses within a destination (Zehrer, 2011). As noted by Baggio and Cooper (2010), tourism is a service industry and effective transfer of knowledge and information between its various organizations is essential. Thus, an effective inter-organizational knowledge flow would be significant to the wellbeing of a tourism destination.

Further clarification of knowledge, including its distinction from

data and information, as well as its tacit and explicit forms, will be discussed under the section of knowledge properties.

2.3. Tourism, knowledge transfer, and networks

Knowledge management is a well-developed discipline with many emerging concepts subsequently integrated into other industries (Novotny et al., 2024). However, the progress in moving KM concepts into tourism practice and research has been criticized. For example, Cooper (2018) enumerates the rationale for this disparity and indicates some of the reasons why tourism has been slow in adopting KM practices such as: the prevalence of small, family-owned businesses with limited managerial capabilities and training, risk aversion within the sector, frequent turnover of both businesses and staff, insufficient trust and collaboration, fragmented tourism offerings, inadequate human resources, and little attempts to measure intangible knowledge resource in tourism.

Numerous studies have addressed the critical topic of transferring knowledge from academia and universities to the tourism industry and its practical applications (Hardy et al., 2018; McLeod, 2020; Ruhanen & Cooper, 2018; Scott et al., 2017). However, despite the proliferation of tourism research and generation of new knowledge in universities, little of this knowledge is being transferred into the industry (Calero-Lemes & García-Almeida, 2020; Ruhanen & Cooper, 2018).

Ritsri and Meeprom (2020) demonstrate the beneficial influence of KM practices on employee productivity. Zehrer (2011) investigated the utilization of knowledge management in Austrian tourism organizations, revealing a predominant application of Grant & Baden-Fuller (2005) KM model. Additionally, the research highlighted a prevalence of intra-organizational knowledge transfer over inter-organizational transfer within the destination. Thomas and Wood (2014, 2015) studied absorptive capacity and proposed a new theoretical model for tourism. KM concepts have been studied in contexts such as mega-events (Werner et al., 2015); multinational corporations in hotels (Situmorang & Japutra, 2024); market knowledge in travel agents (Chen & Lee, 2017); sustainable tourism sector (Martínez-Martínez et al., 2022); and numerous studies on tourism innovation (e.g. Bagiran Ozseker, 2018; Camisón et al., 2017; Marasco et al., 2018; Weidenfeld, 2013; Weidenfeld et al., 2010).

However, closer to the context of our paper, a few studies have considered knowledge transfer in tourism. Kim and Scott (2018) studied the personal factors that impact on inter-organizational knowledge sharing in tourism. In another study, Kim and Shim (2018) have examined the relationships between knowledge sharing, social capital, innovation and performance in SMEs in tourism. Binder (2018) also examined the impact of network relationships on absorptive capacity of hotels. Although these studies address the social capital and network perspective of knowledge transfer and even network impacts are measured; however, the actual network structure which can reveal the knowledge flow and its characteristics is not considered. In another critical conceptual study, Czernek (2017) has examined the tourism-specific factors influencing knowledge transfer and absorption. The paper identifies five determinants which mainly have negative impacts on knowledge transfer and absorption: prevalence of small and medium-sized enterprises, fragmented and diverse supply, vocational reinforcement, ownership specificity, and the regional/local nature of tourism. Our paper differs from the focus of Czernek (2017) in that, we aim to have a broader view which can also include other major antecedents of knowledge transfer which are common among most industries.

Since a network perspective has a pivotal role in the model proposed in this paper, it is important to review the previous network studies in tourism. The application of network approach and network analysis (NA) in tourism research has surged in last few years in a variety of areas. Van Der Zee and Vanneste (2015) review indicates that NA has found application in tourism across policy networks, business networks,

co-opting networks, and network configurations, showcasing its versatility and relevance in various facets of the tourism industry. Sainaghi and Baggio (2017) have categorized the network studies in tourism into policy networks and business networks. Baggio (2017), in a critical review of the field, discussed the state of network science and its application in tourism. Despite the large and increasing number of network studies in tourism, Baggio (2017) believes that the application of network science in tourism is still in its early stage of development. Some areas that network analysis has been used in tourism research in recent years is presented in Table 1 to show and acknowledge its extensive application.

However, despite the diverse application of network approach in tourism, there are few works which have incorporated network analysis into the study of knowledge transfer, but they do not utilize a very comprehensive approach and lack in other KM dimensions of knowledge transfer. Baggio and Cooper (2010) and Del Chiappa and Baggio (2015) utilized an epidemiological modeling approach and computer simulations to investigate knowledge transfer within tourism destinations. However, their analyses focused on general organizational relationships rather than specifically defined knowledge transfer connections. Schaffer and Lawley (2012) explored the evolving information flow network among stakeholders during the development stages of a conservation park, offering insights into network evolution but providing basic network descriptions. Raisi et al. (2020) conducted a

comprehensive structural analysis of a destination's knowledge transfer network; however, their study lacked the incorporation of knowledge management constructs related to knowledge transfer. Overall, when reviewing the existing studies of KM and networks in tourism, despite the essential interwoven nature of knowledge transfer and network, there are no studies which have combined them together to measure and analyze the inter-organizational knowledge flow at the destination level. This paper takes this opportunity to add to existing knowledge by using this approach and proposes a framework and a measurement approach to address this gap.

3. Methodological approach

In establishing our methodology, using Jaakkola (2020)'s template for conceptual papers proposing models for research designing, we adopted a systematic approach to developing a conceptual paper. The systematic approach in this context refers to the deliberate and structured process of constructing theoretical frameworks to construct relationships between concepts. It involves synthesizing existing literature to identify gaps or inconsistencies, selecting relevant theories or concepts, and logically organizing them to develop a coherent model.

In the case of this study's model paper, the systematic approach begins with identifying a focal phenomenon or construct i.e. *knowledge transfer process* that requires further explanation. The researchers then systematically review literature related to the target phenomenon, drawing from diverse disciplines to gain insights into key variables and relationships. By synthesizing this literature (i.e., locating, assessing and selecting the most appropriate components for the model to ensure academic rigour) and constructing a progressive argument to justify the fundamental elements of the design, they develop a theoretical framework that captured a holistic account of knowledge transfer efficiency within a tourism destination. This process involves rigorous reasoning and integration of theories to construct a model that elucidates the mechanisms and processes underlying the phenomenon.

Aligned with MacInnis (2011), this model paper enhances the current knowledge by delineating an entity and its interrelationships with other entities. It serves as a roadmap for comprehending the focal concept, its dynamics, the underlying operational processes, and the potential moderating conditions that may influence it. The study aims to encapsulate its arguments in the form of a visual representation depicting the significant constructs and their interconnections that stem from the conceptual framework. However, considering the large number of components involved and their complexity, building such a model may appear challenging, as the previous section has outlined a wide range of dimensions and therefore components that such a model must include to ensure validity of the measurement.

4. The proposed conceptual model

Various theoretical models have been applied to study inter-organizational knowledge transfer in a wide range of academic and business domains (Martinkenaite, 2011). However, previous studies can be broadly categorized into studies focused on either the 'antecedents' or the 'consequences' of knowledge transfer (Van Wijk et al., 2008). Several studies (Becker & Knudsen, 2006; Easterby-Smith et al., 2008; Van Wijk et al., 2008) have explored various antecedents of knowledge transfer; however, they have often been structured and organized in different ways. Table 2 presents a synthesis of the primary dimensions of knowledge transfer antecedents as suggested by earlier research.

Knowledge transfer is a process (Argote & Ingram, 2000), and at the very most basic level, it comprises three components: 1) the context in which transfer process happens (in this case the tourism network), 2) the sender and recipient of knowledge (in this case the organizations involved), and 3) the knowledge itself (see Fig. 1) (Argote et al., 2003; Becker & Knudsen, 2006).

Many of the studies outlined in Table 2 revolve around these central

Table 1
Application of network analysis in tourism studies.

Tourism areas of NA application	Research studies
policy making	Dela Santa (2013); McCleod et al. (2018); Valeri and Baggio (2021)
tourists movement and activity flows	Asero et al. (2016); Belyi et al. (2017); Bendle (2018); David-Negre et al. (2018); González-Díaz et al. (2015); Hong et al. (2015); Li et al. (2015); Liu et al. (2017); Lozano & Gutiérrez, 2018; Peng et al. (2016); Provenzano et al. (2018); Stienmetz and Fesenmaier (2015)
network configuration of stakeholders' relationships in a tourism destination	Del Chiappa and Presenza (2013); Gajdošík (2015); Grama and Baggio (2014); Kimbu and Ngoasong (2013); Nogueira and Pinho (2015); Lopes et al. (2021); Raisi et al. (2020); Perkins et al. (2022)
web hyperlink connections	Bobkova and Holešinská (2017); Éber et al. (2018); Piazzini et al. (2011); Raisi et al. (2018); Ying et al. (2016)
bibliometric studies of tourism research	Benckendorff and Zehrer (2013); Casanueva et al. (2016); Sainaghi et al. (2018); Shen et al. (2014); Ward and Peláez-Verdet (2018); Fauzi (2023)
tourism innovation networks	Brandão et al. (2018); Kofler et al. (2018); Sørensen and Mattsson (2016); Valeri and Baggio (2021); Anand et al., 2023; Iqbal et al. (2023)
online social media, forums and electronic word of mouth (eWOM)	Belyi et al. (2017); Edwards et al. (2017); Hernández and González-Martel (2017); Luo and Zhong (2015); Provenzano et al. (2018); Williams et al. (2017)
destination evolution	Pavlovich (2003, 2014)
community-based tourism	Burgos and Mertens (2017)
agritourism networks	Karampela et al. (2017)
wildlife tourism micro-entrepreneurship	Kc et al. (2019); Kc et al. (2018)
resilience and climate change	Luthe & Wyss (2016); Luthe et al. (2012); Wyss et al. (2015)
stakeholders and sustainable tourism	Albrecht (2013); Erkuş-Öztürk and Eraydın (2010)
network dynamics	Kim and Scott (2018); Provenzano et al. (2018); Tran et al. (2016); Veiga et al. (2022).
use of ERGM (exponential random graph models)	Khalilzadeh (2018)

Table 2
Summary of dimensions used in previous knowledge transfer studies.

Research	Knowledge transfer dimensions	Level of analysis	Type of study	Comments
Szulanski (1996)	- Source - recipient - context - knowledge	intra-organizational	Empirical	does not consider the structural properties.
Nahapiet and Ghoshal (1998)	- structural - relational - cognitive	-	Conceptual	does not consider organizational properties, such as absorptive capacity
Argote et al. (2003)	- knowledge - units - relationships between units	-	Conceptual	-
Cummings and Teng (2003)	- knowledge context - relational context - activity context - recipient context	both inter and intra-organizational	Empirical	does not consider the structural properties.
Reagans and McEvily (2003)	- social cohesion - network range	intra-organizational	Empirical	-
Ipe (2003)	- nature of Knowledge - motivation to Share - opportunities to Share - culture of the Work environment	inter-personal	Conceptual	-
Levin and Cross (2004)	- Structural - relational - knowledge	Impersonal	empirical	it is focused on the tie strength and trust, does not consider the structural properties, and several other antecedents
Becker and Knudsen (2006)	- network - dyad - individual organization - individual actor - knowledge - applied transfer devices	-	literature review	-
Easterby-Smith et al. (2008)	- the resources and capabilities of the donor and recipient firms - the nature of knowledge - inter-organizational dynamics	-	literature review	-
Van Wijk et al. (2008)	- Knowledge - organizational - network	-	literature review	-
Xu and Ma (2008)	- Source - recipient - knowledge transferred. - Context	inter-personal	empirical	does not consider the structural properties
Fritsch and Kauffeld-Monz (2010)	- network - ego-network - network member - firm	inter-organizational	empirical	does not consider knowledge and organizational properties.
Duan et al. (2010)	- actors - context - content - media	transnational	empirical	does not consider the structural properties.
Martinkenaite (2011)	- knowledge - organization - inter-organizational dynamics	inter-organizational	literature review	-
Wei et al., 2011	- Distance - structural equivalence - team density - team learning culture	inter-personal inter-group	empirical	does not consider some antecedents such as trust, absorptive capacity, knowledge properties
Al-Salti and Hackney (2011)	- knowledge-related - client-related - vendor-related - relationship-related	inter-organizational	Empirical	-
Lawson and Potter (2012)	- Knowledge - motivation - absorptive capacity	inter-organizational	empirical	does not consider the structural properties.
Phelps et al. (2012)	- structural properties - relational properties - nodal properties - knowledge properties	-	literature review	-
Cavallari (2013)	- Trust - absorptive capacity - dependency - ability to share - availability to share - intention to share	inter-personal	conceptual	does not consider the structural properties.

(continued on next page)

Table 2 (continued)

Research	Knowledge transfer dimensions	Level of analysis	Type of study	Comments
Fang et al. (2013)	<ul style="list-style-type: none">- knowledge characteristics- transfer barriers- knowledge governance mechanisms	inter-organizational	conceptual	-
Li, Shi, et al. (2015)	<ul style="list-style-type: none">- knowledge context- supplier context- recipient context- dissemination context- relational context	inter-personal	empirical	does not consider the structural properties, absorptive capacity, and proximities.
Shekhar (2016)	<ul style="list-style-type: none">- inter-organizational factors- organizational factors- task/knowledge factors- individual factors- demographic variables	inter-organizational intra-organizational	empirical	does not consider the structural properties, and antecedents such as absorptive capacity, knowledge ambiguity, tie strength.
Pook et al. (2017)	<ul style="list-style-type: none">- knowledge characteristics- knowledge context- network characteristics	Cross-border	empirical	does not consider the structural properties from network analysis perspective, and antecedents such as proximities, absorptive capacity, knowledge ambiguity, and tie strength.
Raisi et al. (2020)	<ul style="list-style-type: none">- Network- Structural properties- Relational properties	inter-organizational	empirical	Only focuses on the structural dimensions of knowledge transfer and does not consider KM dimensions

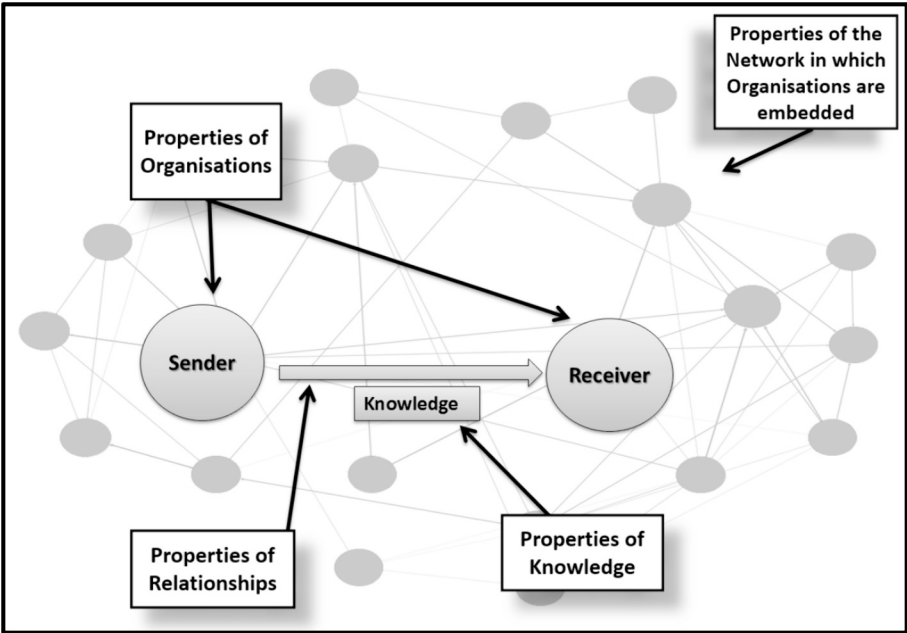


Fig. 1. Knowledge transfer process and its influencing factors.

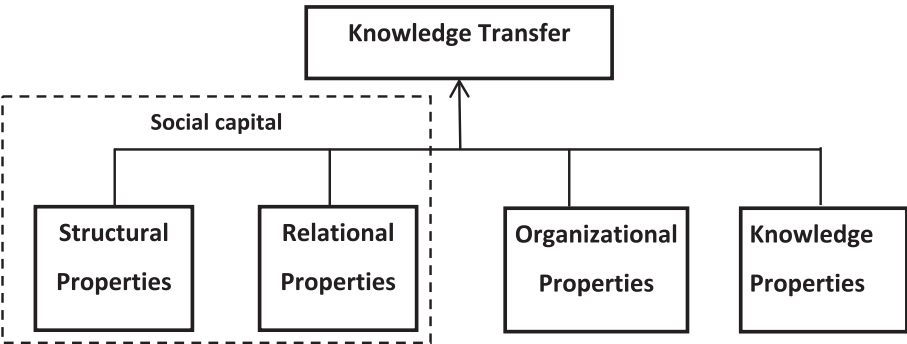


Fig. 2. Basic conceptual model (see Fig. 3 for the full model).

elements. Thus, by reviewing the previous research on knowledge transfer antecedents, and with the aim to build a comprehensive and simultaneously a ‘measurable’ model for a tourism destination, we proposed a conceptual model based on four key dimensions/antecedents: ‘structural properties’, ‘organizational (nodal) properties’, ‘relational properties’ and ‘knowledge properties’.

These core dimensions (Fig. 2: basic conceptual model) and its components (see Fig. 3 for the full model) with the relevance and rationale for their selection are described in detail below. Also, the dimensions’ components incorporated in the model and the academic rigour that supports their choice will be discussed and we believe the final model encompass the key factors influencing the knowledge transfer process for ventures in a tourism destination.

The network’s structural and relational dimensions, as proposed within the model are derived from social capital theory. Social capital, as described by Nahapiet and Ghoshal (1998), refers to the combined actual and potential resources existing within an individual or social unit’s network of relationships. Unlike other capitals (e.g., human capital), the source of value in social capital does not originate from the qualities of each individual, but from the network in which they are embedded (Adler & Kwon, 2002; Rodan & Galunic, 2004). Social capital is a ‘collectivity-owned’ capital (Bourdieu, 2011). Burt (2005, p. 4) asserts that “social capital is the contextual complement to human capital in explaining advantage”.

However, although relationships are considered the major source of social capital, its definition lacks consensus. According to Nahapiet and Ghoshal (1998), in one group of definitions, social capital is limited to the structure of network; while, the second group, in addition to the structure, also includes the assets that can be accessed through the networks; assets such as information and knowledge in this paper. Borgatti et al. (1998) also discuss two different usages of social capital, which are actually two different perspectives of analysis. The first perspective views social capital as the quality of groups or entire societies, encompassing elements such as trust, rule of law, and social integration. The second perspective focuses on individual relationships, where an actor’s position in the network determines their opportunities and constraints.

Social capital theory can effectively explain knowledge transfer resources among the businesses and organizations (Filiari et al., 2014).

Moreover, the relationships between participants in knowledge transfer, the network’s structure, and the extent of these relationships significantly impact knowledge transfer performance (Wang, 2013). The subsequent sections discuss social capital’s structural and relational dimensions in detail.

4.1. Structural properties

Social capital, viewed through a structuralist lens, emphasizes the benefits derived from the structural properties of a network (Rodan & Galunic, 2004). This includes the network of relations and the patterns of connections between actors, with a focus on the existence or lack of ties between actors and the configuration of the network (Anand et al., 2023; Nahapiet & Ghoshal, 1998). Inkpen and Tsang (2005) identified three specific components of the structural dimension: network ties, network configuration, and network stability. However, they also noted that these dimensions are not exhaustive, indicating the complexity of the structural dimension of social capital (Ogutu et al., 2023).

These structural properties can be studied at two levels; ‘group’ or whole network, and ‘individual’, with each requiring different levels of analysis (Borgatti et al., 1998). The group perspective highlights public good within the network, where benefits of social capital are available to all network members, even to actors who do not own or produce those assets (Inkpen & Tsang, 2005). But at the individual level, the emphasis is on ownership and the personal benefits of social capital. However, these two levels of social capital are interconnected, not mutually exclusive (Inkpen & Tsang, 2005).

There are two broad perspectives regarding social capital’s structural source: Coleman (1988)’s network cohesion theory or the bonding view of social capital, and Burt (1992)’s theory of structural holes, focusing on bridging view of social capital at the individual level. Cohesion is determined by the strength of third-party connections surrounding a relationship (Reagans & McEvily, 2003). Network cohesion facilitates the development of norms, identity, trust and cooperation (Gargiulo & Benassi, 2000; Nahapiet & Ghoshal, 1998), decreases the uncertainty of exchange, and promoting involvement and willingness to share knowledge (Reagans & McEvily, 2003; Wei et al., 2011). Due to more direct links between actors in cohesive networks, knowledge and information can transfer more accurately and timely, as transfer over a longer

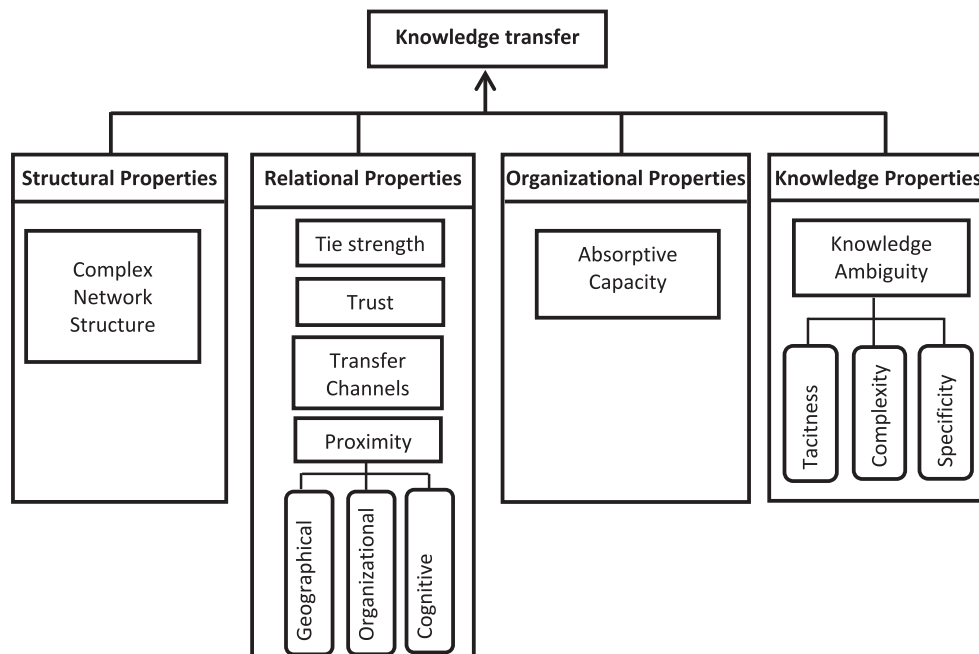


Fig. 3. Conceptual model for a model to measure the efficiency of knowledge transfer within a tourism destination.

distance may cause distortion or delay in transfer (Fritsch & Kauffeld-Monz, 2010). In an alternative view, Burt (1992) proposed the theory of structural holes. Structural hole theory accentuates the advantageous aspect of relationships, claiming that an actor can benefit from the absence of ties between their contacts. According to Burt (2000), structural holes present an opportunity to mediate the flow of information and oversee collaborations uniting individuals from either side of the hole (Burt, 2000). Since each side of the structural hole differ in their knowledge bases, bridging the structural hole provides access to additional rather than overlapping knowledge (Burt, 2000).

There is no scholarly agreement on the optimal network structure (Gargiulo & Benassi, 2000). According to Fritsch and Kauffeld-Monz (2010, p. 23) “cohesion and brokerage are not necessarily in conflict. They can both be combined in a productive manner”. Gargiulo and Benassi (2000) propose that there should be a trade-off between structures that guarantee safety for cooperation and the structure that secures flexibility. However, it is evident that these two structural components cannot be simultaneously maximized.

4.2. Relational properties

The relational aspect of social capital involves the quality and characteristics of relationships and the embedded resources within them (Tsai & Ghoshal, 1998). The relational properties, such as trust and strength of relationships are developed through a history of interactions (Van Wijk et al., 2008). Two actors with a similar position and similar structural properties might behave differently due to their different personal and emotional attachments to other network members (Nahapiet & Ghoshal, 1998; Valeri & Baggio, 2021). While there is no integrative list of factors for structural and relational dimensions (Inkpen & Tsang, 2005), four main factors of relational dimension, including tie strength, trust, transfer channels and proximity, are prominent in the literature, as detailed below.

4.2.1. Tie strength

Granovetter (1973) initiated research on tie strength with his work “The Strength of Weak Ties,” defining it as a composite of time invested, emotional intensity, intimacy, and reciprocal services within a relationship. Therefore, strength of a tie reflects the closeness and interaction frequency of the relationship. Granovetter (1973) suggested that weak ties are more beneficial in aiding individuals in job searches. While in strongly connected groups, a high share of information circulating will be redundant, distant infrequent interactions are more likely to be a source of novel information (Levin & Cross, 2004). Theories have been developed that describe advantages for both ranges of weak and strong ties (Levin & Cross, 2004). While weak ties can help expanding networks to more new ideas (Alavi & Leidner, 2001), research emphasizes the significance of strong ties in knowledge transfer, with strong ties correlating with more substantial knowledge transfer (Levin & Cross, 2004; Van Wijk et al., 2008).

4.2.2. Trust

Trust is recognized as a pivotal element for success in inter-organizational relationships (Seppänen et al., 2007), garnering significant focus in organizational research such as network forms of organization, social capital or the social aspects of knowledge transfer (Anand et al., 2023; Cavallari, 2013). While trust is intuitively an interpersonal phenomenon, it has been taken and extended to organizational level by management scholars. The justification is that trust may be embedded within the organization's roles and procedures rather than solely reliant on individual trust (Young-Ybarra & Wiersema, 1999, p. 443). A definition of trust which is consistent with inter-organizational relationships is proposed by Sako (1991, p. 377) that trust is “a state of mind, an expectation held by one trading partner about another, that the other will behave in a predictable and mutually acceptable manner” (cited in Dodgson, 1993). Following this definition, Young-Ybarra and Wiersema

(1999) defined trust through ‘dependability’, ‘predictability’ and ‘faith’. Trust fosters a conducive environment for knowledge sharing among network participants. Conversely, absence of trust results in competitive ambiguity and concerns over opportunistic actions (Inkpen & Tsang, 2005). Trust also decreases the costs of knowledge transfer by reducing the conflicts and the need to verify information (Levin & Cross, 2004). Despite increasing interest and its acknowledged role, trust is still an under-theorized and poorly understood concept (Seppänen et al., 2007).

4.2.3. Transfer channels

Firms and organizations can transfer knowledge through different mechanisms and media; mechanisms such as training, observation, communication, providing documents, etc. (Argote, 2012). Depending on the characteristics of knowledge to be transferred, different media with different degrees of richness can be used. Based on the Media Richness Theory (MRT) (Daft et al., 1987), media richness is contingent on conveying multiple cues, offering immediate feedback, personalization, and language variety. Richer media encompass more of these attributes. Face-to-face communication is deemed the richest medium, contrasting with written documents as a leaner medium (Chennamaneni & Teng, 2011). When Daft and Lengel (1984) first proposed their media richness theory, it had five media. Later in 1987, they updated and expanded their MRT with email and video conferencing and with interactive media in 1988 (Hornung, 2015). The combination of knowledge characteristics and the suitability of transfer media in terms of richness can impact the efficiency of transfer performance (Pedersen et al., 2003). MRT implies that effective transfer requires a fit between the richness of the media used and the characteristics of knowledge which is being transferred (Cooper, 2018; Windsperger & Gorovaia, 2011). Nature of knowledge can alter the utilization of type of media or media portfolio (Mentzas et al., 2006). However, knowledge transfer via rich media may incur expenses stemming from travel costs, dissimilar organizational cultures, and language disparities (Pedersen et al., 2003). ‘Exaggerated use’ of very lean written media can also result in loss of strategic knowledge. The right fit between the richness of the media and type of knowledge involved needs to be found, and this balance is an important aspect of knowledge management (Pedersen et al., 2003).

4.2.4. Proximity

The significance of proximity as a crucial factor for knowledge transfer is widely acknowledged in inter-organizational collaboration, innovation, and regional economic advancement (Knoben & Oerlemans, 2006). While many studies focus solely on geographical proximity, alternative forms of proximity have been suggested, including cognitive, organizational, social, institutional, cultural, technological, and norm proximity (Boschma, 2005; Cummings & Teng, 2003). Boschma & Frenken (2010) described five types of proximity briefly as: cognitive proximity reflects the similarity in knowledge bases between two organizations; organizational proximity denotes shared hierarchical control; social proximity signifies friendly relationships among members; institutional proximity indicates adherence to common institutions; and geographical proximity represents the physical distance or travel time between organizations. The five proximity dimensions are not mutually exclusive, they may overlap (Broekel & Hartog, 2013). Institutional and organizational proximity have similarities. Also, a very similar concept to social proximity is embedded in tie strength (having friendly and close relationships). Thus, below geographical, organizational and cognitive proximities will be described further. In addition, two other types of distance also exist which are related to networks and are measured with network metrics: (1) path length which shows the distance between nodes in the network (2) a similarity-based distance in which similar nodes are considered closer.

Geographical proximity, also known as spatial, local or physical proximity, facilitates the face-to-face interactions, thereby enhancing knowledge transfer, especially tacit knowledge (Knoben & Oerlemans, 2006). Conversely, lack of physical proximity or large physical distance

between network actors hinders the development of social capital (Cummings & Teng, 2003). Lack of physical proximity increases the difficulties, expenses and time requirements for face-to-face communications (Cummings, 2003). However, geographical proximity might also diminish a firm's innovative performance (Broekel & Boschma, 2012; Broekel et al., 2010). Boschma (2005) argued that geographical proximity is just one aspect of proximity and primarily reinforces the impacts of other proximities, proposing four additional dimensions of proximity.

Organizational proximity has been variously defined and is conceptually ambiguous (Knoben & Oerlemans, 2006). Organizational proximity can be viewed as a continuum in which one extreme goes to totally independent actors and the other extreme goes to high degree of control over organizational arrangements, such as a hierarchically organized firm or network (Boschma, 2005). Organizational proximity plays a crucial role in managing knowledge exchange and reducing transaction costs. However, excessive organizational proximity may hinder interactive learning by limiting flexibility (Broekel & Boschma, 2012). Another perspective defines organizational proximity as the similarity in routines and incentive mechanisms among organizations (Broekel & Boschma, 2012). There is distinction for example between profit and non-profit organizations in terms of knowledge transfer with other organizations (Broekel & Boschma, 2012); or transfer of knowledge among interconnected entities like franchises and chains, federation, strategic alliances and networks is more effective than outsiders (Cummings & Teng, 2003). Organizational proximity reduces the uncertainty, opportunism and transaction costs (Boschma & Frenken, 2010; Broekel & Boschma, 2012). Conversely, excessive organizational proximity can limit the flexibility (Boschma, 2005).

Cognitive proximity, introduced by Nooteboom (1999), refers to the likeness in how individuals perceive, interpret, comprehend, and assess the world (Knoben & Oerlemans, 2006). It gauges the similarity in knowledge bases between two actors (Boschma & Frenken, 2010). When the knowledge gap between actors is substantial, knowledge transfer becomes exceedingly challenging. This is because the recipient may struggle to discern the required learning processes to align with their counterpart (Cummings & Teng, 2003). On the other hand, too similar knowledge bases will lower the transfer of new knowledge and likelihood of innovation (Broekel & Boschma, 2012; Cummings & Teng, 2003). Therefore, the optimal level is to keep some cognitive distance and secure some cognitive proximity (Broekel & Boschma, 2012). A balance must be struck between cognitive distance to foster innovation and cognitive proximity to enhance efficient absorption (Nooteboom, 2000).

4.3. Organizational properties

Knowledge transfer involves the bilateral sharing of information between the sender and recipient organizations, influenced by their respective characteristics (Mentzas et al., 2006). Organizational traits impacting this process, as categorized by Easterby-Smith et al. (2008), include absorptive capacity, motivation for learning, and intra-organizational transfer capability. Absorptive capacity as a pivotal aspect is a prominent theme in knowledge transfer literature (Martinkenaite, 2011). While factors like size, age, and decentralization have been explored in relation to knowledge transfer (Van Wijk et al., 2008), existing studies offer inconclusive findings regarding the effects of age and size on this process (Van Wijk et al., 2008). Given the crucial role of absorptive capacity, a detailed explanation follows.

4.3.1. Absorptive capacity

Acquiring external knowledge is a multifaceted process that necessitates firms to cultivate the capacity to discover, integrate, and subsequently disseminate new knowledge within their framework (Muscio, 2007). Absorptive capacity, initially defined by Cohen and Levinthal (1990, p. 128), denotes a firm's proficiency in recognizing the value of new information, assimilating it, and leveraging it for commercial

purposes. Zahra and George (2002) characterized absorptive capacity as a collection of organizational practices and procedures through which firms gather, integrate, transform, and exploit knowledge to foster a dynamic organizational capability. They introduced the dimensions of 'potential' and 'realized' absorptive capacity, highlighting that organizations might acquire and assimilate new knowledge but might not be able to effectively utilize and apply it in a commercial context.

Another significant conceptualization was offered by Lane and Lubatkin (1998), who emphasized the 'relative' aspect of absorptive capacity. This perspective claims that a firm's absorptive capacity is not solely contingent on the firm itself but also on the knowledge source (Lane & Lubatkin, 1998). They argue that a firm's ability to learn from another firm hinges on the similarity between the firms in three key elements: knowledge base, organizational structures and compensation policies, and dominant logics (Lane & Lubatkin, 1998). Consequently, organizations sharing substantial common knowledge (or high cognitive proximity) are likely to exhibit elevated relative absorptive capacity (Cummings & Teng, 2003).

In tourism, only two works authored by Thomas and Wood (2014, 2015) are dedicated to absorptive capacity. Presenting new conceptual frameworks, they conclude that absorptive capacity is still in a 'black box'. They argue that absorptive capacity needs to be re-assessed and re-conceptualized to be applicable in tourism.

4.4. Knowledge properties

The intangible, valuable, and causally ambiguous characteristics of knowledge make it difficult to substitute or copy (Fang et al., 2013), and affect its transfer within and between organizations (Argote et al., 2003). Knowledge attributes have emerged as a significant antecedent of knowledge transfer in a large number of recent research (Van Wijk et al., 2008). The most common characteristics of knowledge studied are ambiguity, stickiness, complexity, tacitness, explicitness, context dependence and specificity (Fang et al., 2013; Lopes et al., 2021). For this paper, we use knowledge ambiguity which encompasses knowledge tacitness, complexity and specificity (Lakshman et al., 2021) is recognized as a critical attribute among various knowledge properties (Cummings & Teng, 2003; Fauzi, 2023).

Causal ambiguity, as defined by Van Wijk et al. (2008, p. 833), pertains to the inherent uncertainty regarding the precise components and interactions of underlying knowledge sources. This ambiguity stems from the attributes of 'tacitness', 'complexity', and 'specificity' (Reed & DeFillippi, 1990).

Polanyi (1967) identified two aspects of knowledge as tacit and explicit. Tacit knowledge, as described by Cummings and Teng (2003), is intuitive, unspoken, and deeply embedded in specific contexts, often beyond verbal articulation (Nonaka, 2005). This type of knowledge is why individuals possess more knowledge than they can explicitly convey (Polanyi, 1966). In contrast, explicit knowledge, according to Alavi and Leidner (2001), is formalized, codified, and communicated in symbolic or natural language. In this context, knowledge is likened to an 'iceberg', where explicit knowledge represents the visible tip that is easily accessible and shareable, while tacit knowledge is the more extensive and invisible knowledge beneath the surface that is difficult to locate (Sveiby, 1997).

In addition to tacitness, complex core competencies can also generate ambiguity (Reed & DeFillippi, 1990). Zander and Kogut (1995) elucidate that complexity arises from the diverse integration of competencies, making knowledge more complex and challenging to transfer (p. 79). Complexity refers to the inherent characteristics of an asset or its deployment. It affects comprehension of knowledge and impedes its transferability (Simonin, 1999).

Specificity, the final component of knowledge ambiguity, pertains to the particular skills and assets utilized in transaction processes (Reed & DeFillippi, 1990). This specificity often engenders a high level of interdependence among transaction parties, leading to inherent

uncertainty regarding the underlying knowledge components and their interactions (Martinkenaite, 2011, p. 59).

The combined presence of high tacitness, complexity, and specificity in knowledge amplifies causal ambiguity (Martinkenaite, 2011). This ambiguity poses a dual challenge for organizations, acting as a barrier against imitation by competitors while simultaneously hindering knowledge transfer within and across organizations (Martinkenaite, 2011; Priestley, 2003).

Various perspectives on defining knowledge and its attributes are explored in the literature, alongside discussions on the differentiation between data, information, and knowledge. This distinction aids in clarifying the essence of knowledge, particularly concerning measurement. The conventional understanding posits that “data comprises raw numbers and facts, information results from processed data, and knowledge is authenticated information” (Alavi & Leidner, 2001, p. 109). Nonaka (1994, p. 15) suggests that “Information represents a flow of messages, whereas knowledge is generated and structured through this information flow, rooted in the commitment and beliefs of its possessor.” Knowledge is essentially personalized information (Alavi & Leidner, 2001), encompassing both information and practical expertise (Wang & Noe, 2010). However, some authors such as Tuomi (1999), have contradicted this hierarchy of data, information, and knowledge, arguing that it is reverse. They argue that knowledge must exist first and precede data, as it is knowledge that is used to distinguish and measure data to form information (Alavi & Kane, 2008). However, researchers also argue that, in practice, it is not generally useful to distinguish between knowledge and information in knowledge sharing research as both concepts lack discrete boundaries, with the division often being perceptual rather than concrete and often used interchangeably (Wang & Noe, 2010).

Fig. 3 shows the complete research model which incorporated all constructs discussed thus far.

5. Proposed measurement: network analysis and weighted diffusion model

The main purpose of this paper is to propose a conceptual model which can practically measure the efficiency of knowledge transfer within a tourism destination. Given the complexity of the numerous elements involved, the model's measurement may present challenges. Therefore, although this paper is basically a conceptual paper, a proposed measurement approach is briefly explained in this section. The aim is not to provide a detailed measurement for the framework, but an overall methodological approach is described.

The model in Fig. 3 has four dimensions along with their underlying constructs. The model is broadly in two complementary sections. The first is a detailed structural analysis of the knowledge network using network analysis. The second is a weighted diffusion model that integrates all dimensions to measure knowledge transfer efficiency. It should be noted that efficiency in this study refers to the capability of actors (nodes) to exchange information or knowledge within the network. Latora and Marchiori (2001) defined the concept of network efficiency as the effectiveness of information exchange, measurable at local or global levels. Their measurement only considers the structural dimension of the network mainly using ‘path length’. However, our model extends this approach to efficiency by incorporating other dimensions of KM to make the measurement more robust, as explained earlier and described more in the next few paragraphs.

Prior to describing these two approaches, data collection will need a brief consideration. A questionnaire is the preferred tool for data collection, especially for large destinations. To collect the network or relational data, name generator questions are used (Burt, 1984; Marsden, 1990). A name generator is a question which asks about the relationships of the respondents (organizations, enterprises), such as: please name the companies which you receive the knowledge for your business from. Name generators aim to provide the data to build the

network of relationships. The second type of questions are name interpreters, which add more quality data to the relationships, such as: regarding your relationships with each of the contacts you provided, please specify how frequently do you meet? Name interpreters will be formulated according to the data needed for the relational, and knowledge properties dimension of the framework, such as trust, channels of transfer, proximity or types of knowledge transferred.

Returning back to the two measurement approaches, network analysis provides a strong toolkit to analyze the relationships (see Barabási, 2016; Scott, 2017). Here a brief overview of NA metrics that could be used is provided. The use of NA in tourism was outlined by Baggio (2018) and Scott et al. (2008); an example of a comprehensive application of NA in tourism was provided by Raisi et al. (2020). Generally, the topological characteristics of the network can be analyzed at three levels of global or whole network, sectoral, and individual. Complex networks, such as a destination network (Baggio, 2008) display some characteristics which when identified assist us in understanding and even predicting the behaviour of the network. Networks can have topological characteristics such as scale-free networks (Barabási, 2009), preferential attachment (Jeong et al., 2003), small-worldness (Watts & Strogatz, 1998), hierarchical structure (Ravasz & Barabási, 2003), and each characteristic can be very effective in providing an indication of how the network functions. At a layer deeper, NA can explore the structure and formation of clusters and components of the network. Metrics such as clustering coefficient, modularity (Newman, 2006), assortativity (Newman, 2002) and homophily (McPherson et al., 2001) can help understand the extent of clustering of a network and some of the underlying causes for such structural formations. NA can also show the structural characteristics of each node in the network. Different metrics of centrality can identify the important actors and the peripheral actors of the network. NA can also help identify the boundary spanning actors in the network which for an information and knowledge transfer network can be helpful in finding and monitoring the gatekeepers who transfer the external knowledge within a network.

Overall, NA offers a variety of useful tools to understand the network structure. However, the mere structural analyses of the network cannot provide enough understanding of a complex phenomenon such as knowledge transfer. Qualitative data can enrich the NA results and make them more robust and reliable and that is why the other three dimensions of the model are measured. However, the structural analysis of the network, and if needed with support of some survey data, can fulfil the purpose of the first part of the analysis.

For the second part of the measurement exploring the organizational and knowledge properties, all the dimensions chosen for the model is integrated into a weighted diffusion model that can measure the efficiency of the knowledge network. Diffusion models have received increasing attention; however, few studies have considered measuring the efficiency of knowledge diffusion (Jiafu et al., 2018). In tourism, only two studies have used an epidemiological computer simulation model to examine the transfer of knowledge within a tourism destination (Baggio & Cooper, 2010; Del Chiappa & Baggio, 2015).

What we propose here is using the structural, relational, organizational and knowledge properties as weights to incorporate into a weighted diffusion model. This method assigns weights to nodes (tourism organizations) and ties (transfer of knowledge between nodes) based on knowledge transfer antecedents in the model and collected via a survey. For example, trust, tie strength and knowledge ambiguity will be assigned as ties' weights and absorptive capacity for nodes. Next, the efficiency of transfer for each pair of nodes and finally for the whole network can be calculated. The result will be an efficiency value for the network that ranges from 0 to 1, whereby 1 indicates the highest efficiency. Detailed calculations and processes were described by Su et al. (2017). Combining these two stages can provide a more holistic knowledge transfer status of the network and offer a complete picture of knowledge transfer within the destination.

6. Conclusion and implications

This study set out to address the research enquiry; what model could measure the efficiency of knowledge transfer within tourism destinations. The outcome is the development of a model to study knowledge transfer in tourism destinations. The study advocates for and constructs a model to analyze knowledge transfer in tourism settings. It is premised on the significance of proficient knowledge transfer in a tourism network to enhance innovation and competitiveness (Cooper, 2018; Swanson et al., 2020). The primary purpose of this study was to develop a model that captured a holistic account of knowledge transfer efficiency within a tourism destination. Our research drew on social capital theory, with the four dimensions of the model aiming to examine the structure of the network of knowledge flow, the nature and quality of the relationships, the ability of the organizations to receive and absorb the new knowledge, and the nature of knowledge being transferred. These dimensions encompass key factors influencing knowledge transfer, including trust, proximity, tie strength, tacitness of knowledge, and network structure. The proposed measurement approach includes a structural analysis of the network using network analysis techniques and a weighted knowledge diffusion model to quantify knowledge transfer efficiency within the destination.

6.1. Theoretical implications

The theoretical implication of the study lies in its contribution to the understanding of knowledge transfer dynamics within tourism destinations, at the inter-organizational level. By proposing a conceptual model that integrates social capital theory and knowledge management constructs, the study aims to advance knowledge in this area. Specifically, the model identifies four pivotal dimensions (structural, relational, organizational, and knowledge properties) that influence knowledge transfer efficiency. This framework offers a structured approach to conceptualizing and analyzing knowledge transfer processes within tourism destinations. Additionally, the study contributes to bridging the gap in academic literature regarding the underutilization of knowledge management concepts in the tourism sector. It emphasizes the importance of considering destination-level knowledge transfer for enhancing innovation and competitiveness in the tourism industry. Cooper (2018) indicates that the complexity of measuring *intangible assets* such as knowledge and knowledge transfer within tourism destinations has hindered the integration of KM into tourism. Our model proposes a way to empirically measure and quantify the status of knowledge transfer within a destination, thus building from and extending existing research within the tourism field.

6.2. Practical and managerial implications

From a practical and managerial perspective, the study provides valuable insights for enhancing collaboration capabilities among stakeholders involved in tourism destination management. By acknowledging the complexities of knowledge transfer and proposing a practical model for assessing and enhancing knowledge flow, the research offers a roadmap for strategic interventions. By utilizing this model, stakeholders in the tourism industry can more effectively manage knowledge within their networks, fostering stronger and more innovative tourism clusters.

Destination managers, policymakers, and industry practitioners can utilize the proposed model to identify constraints and opportunities for improving knowledge transfer processes within tourism destinations. Moreover, the measurement approach based on a network perspective enables destination comparisons and facilitates the identification of best practices. This practical applicability of the model empowers stakeholders to make informed decisions and allocate resources effectively to foster innovation and competitiveness in tourism destinations.

Furthermore, consideration should be given to the network structure

of tourist destinations. Optimizing this structure can lead to more efficient dissemination of knowledge among business actors, fostering the development of 'learning destinations' that are better equipped to compete in the global tourism market. Overall, embracing efficient knowledge transfer mechanisms and leveraging network dynamics are essential strategies for enhancing competitiveness and ensuring the long-term sustainability of tourism destinations.

7. Limitations and future research

However, this model is yet at the stage of a proposal; it needs to be further tested empirically to modify and strengthen it to make it more robust. As a conceptual paper, the primary intention is to argue for the relevance of the dimensions incorporated in the model and the academic rigour that supports their choice. The paper also indicates how the dimensions incorporated within the model will be measured in practice, but the intention is not to provide a detailed measurement for the model, but rather to present an overall methodological approach.

Furthermore, the comprehensive list of antecedents of knowledge transfer studied in KM literature poses a challenge in fully integrating them into a model while ensuring practicality. To maintain the model's practicality, it is crucial to include only essential factors for a valid observation. However, there are additional areas of research that could extend this research approach. For instance, this paper also does not include the transfer of knowledge inside the organizations, between the individuals, or knowledge transfer with customers. Indeed, the transfer of knowledge between the industry and the academic world that is an established weakness, and that has gained considerable attention in research, is not considered in this study and may be a valuable pursuit. Future research could expand the model to encompass various types of tourism destinations, such as regional destinations that may lack the resources available in metropolitan areas (Perkins et al., 2022). Additionally, exploring the impact of stakeholder typologies and networks on the formation of business clusters, as well as the influence of digital transformation on knowledge management for the success of tourism destinations, could be valuable areas for investigation. These suggestions have the capacity to prompt adjustments in the model to better address a range of contexts and variables.

Another point to note is that the proposed model can create and capture a snapshot of the situation in a destination at a particular time. However, as destination networks of relationships and knowledge flow are dynamic and continually changing, repeating the measurement over a period of time may then provide a comparative picture of this dynamic evolution of the destination knowledge flow. This approach can also help track and evaluate the impact of management interventions on knowledge transfer in the destination.

Considering the lack of attention to knowledge management in tourism, both at the levels of research and industry management, this study will be useful in providing more insight into the efficiency of knowledge transfer within destinations. Extensive empirical application of the model is now required in a variety of destinations with diverse characteristics to incrementally improve and consolidate the commonest to refine the model effectiveness.

CRedit authorship contribution statement

Hossein Raisi: Writing – review & editing, Writing – original draft, Visualization, Methodology, Conceptualization. **Kourosh Esfandiar:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Llandis Barratt-Pugh:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Gregory Willson:** Writing – review & editing. **Rodolfo Baggio:** Writing – review & editing, Writing – original draft, Conceptualization.

Declaration of competing interest

None.

Acknowledgments

We gratefully acknowledge the invaluable contributions of the anonymous reviewers, whose expertise and constructive feedback significantly enhanced the quality of this manuscript.

References

- Abdollahi, A., Ghaderi, Z., Béal, L., & Cooper, C. (2023). The intersection between knowledge management and organizational learning in tourism and hospitality: A bibliometric analysis. *Journal of Hospitality and Tourism Management*, 55, 11–28. <https://doi.org/10.1016/j.jhtm.2023.02.014>
- Adler, P. S., & Kwon, S.-W. (2002). Social capital: Prospects for a new concept. *Academy of Management Review*, 27(1), 17–40.
- Alavi, M., & Kane, G. C. (2008). Social networks and information technology: Evolution and new frontiers. In I. Becerra-Fernandez, & D. Leidner (Eds.), *Vol. 12. Knowledge Management: An Evolutionary View* (pp. 63–85). Armonk, NY: Advances in Management Information System.
- Alavi, M., & Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*, 107–136.
- Albrecht, J. N. (2013). Networking for sustainable tourism – towards a research agenda. *Journal of Sustainable Tourism*, 21(5), 639–657. <https://doi.org/10.1080/09669582.2012.721788>
- Al-Salti, Z., & Hackney, R. (2011). Factors impacting knowledge transfer success in information systems outsourcing. *Journal of Enterprise Information Management*, 24(5), 455–468.
- Anand, A., Shantakumar, V., Muskat, B., Singh, S., Dumazert, J., & Riahi, Y. (2023). The role of knowledge management in the tourism sector: A synthesis and way forward. *Journal of Knowledge Management*, 27(5), 1319–1342. <https://doi.org/10.1108/jkm-02-2022-0083>
- Argote, L. (2012). *Organizational learning: Creating, retaining and transferring knowledge*. Springer Science & Business Media.
- Argote, L., & Ingram, P. (2000). Knowledge transfer: A basis for competitive advantage in firms. *Organizational Behavior and Human Decision Processes*, 82(1), 150–169.
- Argote, L., McEvily, B., & Reagans, R. (2003). Managing knowledge in organizations: An integrative model and review of emerging themes. *Management Science*, 49(4), 571–582.
- Asero, V., Gozzo, S., & Tomaselli, V. (2016). Building tourism networks through tourist mobility. *Journal of Travel Research*, 55(6), 751–763.
- Baggio, R. (2008). Symptoms of complexity in a tourism system. *Tourism Analysis*, 13(1), 1–20.
- Baggio, R. (2017). Network science and tourism—the state of the art. *Tourism Review*, 72(1), 120–131.
- Baggio, R. (2018). Network analysis: Quantitative methods in tourism. In C. Cooper, S. Volo, W. C. Gartner, & N. Scott (Eds.), *The SAGE Handbook of Tourism Management* (pp. 150–171). SAGE.
- Baggio, R., & Cooper, C. (2010). Knowledge transfer in a tourism destination: The effects of a network structure. *The Service Industries Journal*, 30(10), 1757–1771. <https://doi.org/10.1080/02642060903580649>
- Bagiran Ozseker, D. (2018). Towards a model of destination innovation process: An integrative review. *The Service Industries Journal*, 1–23.
- Banmairuoy, W., Kritjaroen, T., & Homsombat, W. (2022). The effect of knowledge-oriented leadership and human resource development on sustainable competitive advantage through organizational innovation's component factors: Evidence from Thailand's new S-curve industries. *Asia Pacific Management Review*, 27(3), 200–209.
- Bapiri, J., Esfandiari, K., & O'Connor, P. (2024). Business models of multisited platforms for in-destination tours and activities: A morphological analysis approach. *Journal of Travel & Tourism Marketing*, 41(6), 828–848. <https://doi.org/10.1080/10548408.2024.2349815>
- Barabási, A.-L. (2009). Scale-free networks: A decade and beyond. *Science*, 325(5939), 412–413.
- Barabási, A.-L. (2016). *Network Science*. Cambridge University Press.
- Becker, M. C., & Knudsen, M. P. (2006). *Intra and Inter-Organizational Knowledge Transfer Processes: Identifying the Missing Links: DRUID*. Copenhagen Business School, Department of Industrial Economics and Strategy/Aalborg University, Department of Business Studies.
- Belyi, A., Bojic, I., Sobolevsky, S., Sitko, I., Hawelka, B., Rudikova, L., ... Ratti, C. (2017). Global multi-layer network of human mobility. *International Journal of Geographical Information Science*, 31(7), 1381–1402.
- Benckendorff, P., & Zehrer, A. (2013). A network analysis of tourism research. *Annals of Tourism Research*, 43, 121–149. <https://doi.org/10.1016/j.annals.2013.04.005>
- Bendle, L. J. (2018). The structures and flows of a large tourist itinerancy network. *Current Issues in Tourism*, 21(1), 103–122.
- Binder, P. (2018). Impacts of network relationships on absorptive capacity in the context of innovation. *The Service Industries Journal*, 1–29.
- Birch, K., & Cumbers, A. (2010). Knowledge, space, and economic governance: The implications of knowledge-based commodity chains for less-favoured regions. *Environment and Planning A: Economy and Space*, 42(11), 2581–2601. <https://doi.org/10.1068/a43191>
- Bobkova, M., & Holešinská, A. (2017). Networking in a destination from the perspective of virtual relationships and their spatial dimension. *Geographia Technica*, 12(2), 10–19.
- Borgatti, S. P., Jones, C., & Everett, M. G. (1998). Network measures of social capital. *Connections*, 21(2), 27–36.
- Boschma, R. (2005). Proximity and innovation: A critical assessment. *Regional Studies*, 39(1), 61–74.
- Boschma, R. A., & Frenken, K. (2010). The spatial evolution of innovation networks : a proximity perspective. In R. A. Boschma, & R. Martin (Eds.), *The handbook of evolutionary economic geography* (pp. 120–135). Edward Elgar.
- Bourdieu, P. (2011). “The forms of capital” (1986). In I. Szeman, & T. Kaposy (Eds.), *Cultural theory: An anthology* (pp. 81–93). UK: John Wiley & Sons.
- Brandão, F., Costa, C., & Buhalis, D. (2018). Tourism innovation networks: A regional approach. *European Journal of Tourism Research*, 18, 33–56.
- Broekel, T., & Boschma, R. (2012). Knowledge networks in the Dutch aviation industry: the proximity paradox. *Journal of Economic Geography*, 12(2), 409–433.
- Broekel, T., Buerger, M., & Brenner, T. (2010). An investigation of the relation between cooperation and the innovative success of German regions. *Papers in Evolutionary Economic Geography*, 10.
- Broekel, T., & Hartog, M. (2013). Explaining the structure of inter-organizational networks using exponential random graph models. *Industry and Innovation*, 20(3), 277–295.
- Burgos, A., & Mertens, F. (2017). Participatory management of community-based tourism: A network perspective. *Community Development*, 48(4), 546–565.
- Burt, R. S. (1984). Network items and the general social survey. *Social Networks*, 6(4), 293–339.
- Burt, R. S. (1992). *Structural hole*. Cambridge, MA: Harvard Business School Press.
- Burt, R. S. (2000). The network structure of social capital. *Research in Organizational Behavior*, 22, 345–423. [https://doi.org/10.1016/s0191-3085\(00\)22009-1](https://doi.org/10.1016/s0191-3085(00)22009-1)
- Burt, R. S. (2005). *Brokerage and closure: An introduction to social capital*. Oxford University Press.
- Calero-Lemes, P., & García-Almeida, D. (2020). Immigrant entrepreneur knowledge in the tourism industry of island destinations. *Tourism Geographies*, 23(3), 527–551. <https://doi.org/10.1080/14616688.2020.1786152>
- Camisón, C., Forés, B., & Boronat-Navarro, M. (2017). Cluster and firm-specific antecedents of organizational innovation. *Current Issues in Tourism*, 20(6), 617–646.
- Casanueva, C., Gallego, Á., & García-Sánchez, M.-R. (2016). Social network analysis in tourism. *Current Issues in Tourism*, 19(12), 1190–1209.
- Cavallari, M. (2013). The determinants of knowledge transfer: The study of a refined model. *Organizational Change and Information Systems*, 257–265. https://doi.org/10.1007/978-3-642-37228-5_25
- Chen, K.-Y., & Lee, C.-F. (2017). Market knowledge of the travel industry from knowledge-based view: A case of two Taiwanese travel agencies. *Asia Pacific Journal of Tourism Research*, 22(7), 781–797.
- Chen, M., Wu, S., Huang, Y., & Chang, F. (2022). The key success factors for the operation of sme cluster business ecosystem. *Sustainability*, 14(14), 8236. <https://doi.org/10.3390/su14148236>
- Chennamaneni, A., & Teng, J. T. (2011). *An Integrated Framework for Effective Tacit Knowledge Transfer* (Paper presented at the AMCIS).
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 128–152.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, S95–S120.
- Conner, K. R., & Prahalad, C. K. (1996). A resource-based theory of the firm: Knowledge versus opportunism. *Organization Science*, 7(5), 477–501.
- Cooper, C. (2015). Managing tourism knowledge. *Tourism Recreation Research*, 40(1), 107–119.
- Cooper, C. (2018). Managing tourism knowledge: A review. *Tourism Review*. <https://doi.org/10.1108/TR-06-2017-0104>
- Cummings, J. (2003). Knowledge sharing: A review of literature. In *Operations Evaluation Department (OED) working paper series*. Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/180841468339019749/Knowledge-sharing-a-review-of-the-literature>
- Cummings, J. L., & Teng, B.-S. (2003). Transferring R&D knowledge: The key factors affecting knowledge transfer success. *Journal of Engineering and Technology Management*, 20(1), 39–68.
- Czernek, K. (2014). Tourism features as determinants of knowledge transfer in the process of tourist cooperation. *Current Issues in Tourism*, 1–17.
- Czernek, K. (2017). Tourism features as determinants of knowledge transfer in the process of tourist cooperation. *Current Issues in Tourism*, 20(2), 204–220. <https://doi.org/10.1080/13683500.2014.944107>
- Daft, R. L., & Lengel, R. H. (1984). *Information Richness. A New Approach to Managerial Behavior and Organization Design*. Texas A and M Univ College Station Coll of Business Administration.
- Daft, R. L., Lengel, R. H., & Trevino, L. K. (1987). Message equivocality, media selection, and manager performance: Implications for information systems. *MIS quarterly*, 355–366.
- David-Negre, T., Hernández, J. M., & Moreno-Gil, S. (2018). Understanding tourists' leisure expenditure at the destination: A social network analysis. *Journal of Travel & Tourism Marketing*, 1–16.
- Del Chiappa, G., & Baggio, R. (2015). Knowledge transfer in smart tourism destinations: Analyzing the effects of a network structure. *Journal of Destination Marketing & Management*, 4(3), 145–150.

- Dela Santa, E. (2013). The politics of implementing Philippine tourism policy: A policy network and advocacy coalition framework approach. *Asia Pacific Journal of Tourism Research*, 18(8), 913–933. <https://doi.org/10.1080/10941665.2012.717958>
- Dodgson, M. (1993). Learning, trust, and technological collaboration. *Human relations*, 46(1), 77–95.
- Duan, Y., Nie, W., & Coakes, E. (2010). Identifying key factors affecting transnational knowledge transfer. *Information & Management*, 47(7), 356–363.
- Durst, S., & Runar Edvardsson, I. (2012). Knowledge management in SMEs: A literature review. *Journal of Knowledge Management*, 16(6), 879–903.
- Easterby-Smith, M., Lyles, M. A., & Tsang, E. W. (2008). Inter-organizational knowledge transfer: Current themes and future prospects. *Journal of Management Studies*, 45(4), 677–690.
- Éber, F. Z., Baggio, R., & Fuchs, M. (2018). Hyperlink network analysis of a multi destination region: The case of Halland, South Sweden. *Information Technology & Tourism*, 1–8.
- Edwards, D., Cheng, M., Wong, I. A., Zhang, J., & Wu, Q. (2017). Ambassadors of knowledge sharing: Co-produced travel information through tourist-local social media exchange. *International Journal of Contemporary Hospitality Management*, 29(2), 690–708.
- Edwards, J. S. (2015). Knowledge management concepts and models. In *Advances in Knowledge Management* (pp. 25–44). Springer.
- Erkuş-Öztürk, H., & Eraydin, A. (2010). Environmental governance for sustainable tourism development: Collaborative networks and organisation building in the Antalya tourism region. *Tourism Management*, 31(1), 113–124. <https://doi.org/10.1016/j.tourman.2009.01.00>
- Esfandiari, K., Bapiri, J., & Kuhzady, S. (2024). The impact of the sharing economy on tourism microentrepreneurship. In R. Hallak & C. Lee (Eds.), *Handbook of Tourism Entrepreneurship*, (Chapter 27, pp. 384–398). Cheltenham, UK: Edward Elgar Publishing. doi:<https://doi.org/10.4337/9781803920023.00037>.
- Fang, S.-C., Yang, C.-W., & Hsu, W.-Y. (2013). Inter-organizational knowledge transfer: The perspective of knowledge governance. *Journal of Knowledge Management*, 17(6), 943–957.
- Fauzi, M. A. (2023). A bibliometric review on knowledge management in tourism and hospitality: Past, present and future trends. *International Journal of Contemporary Hospitality Management*, 35(6), 2178–2201. <https://doi.org/10.1108/IJCHM-03-2022-0381>.
- Filieri, R., McNally, R. C., O'Dwyer, M., & O'Malley, L. (2014). Structural social capital evolution and knowledge transfer: Evidence from an Irish pharmaceutical network. *Industrial Marketing Management*, 43(3), 429–440.
- Fochler, M. (2016). Beyond and between academia and business: How Austrian biotechnology researchers describe high-tech startup companies as spaces of knowledge production. *Social Studies of Science*, 46(2), 259–281.
- Fritsch, M., & Kauffeld-Monz, M. (2010). The impact of network structure on knowledge transfer: An application of social network analysis in the context of regional innovation networks. *The Annals of Regional Science*, 44(1), 21–38.
- Gajdosik, T. (2015). Network analysis of cooperation in tourism destinations. *Czech Journal of Tourism*, 4(1), 26–44.
- García-Almeida, D. J., & Cruz, A. M. B. (2020). Successful replication of knowledge in the growth of service organizations: Evidence from spanish hotel chains. *Journal of Knowledge Management*, 24(9), 2217–2241. <https://doi.org/10.1108/jkm-12-2019-0700>
- Gargiulo, M., & Benassi, M. (2000). Trapped in your own net? Network cohesion, structural holes, and the adaptation of social capital. *Organization Science*, 11(2), 183–196.
- González-Díaz, B., Gómez, M., & Molina, A. (2015). Configuration of the hotel and non-hotel accommodations: An empirical approach using network analysis. *International Journal of Hospitality Management*, 48, 39–51.
- Grama, C.-N., & Baggio, R. (2014). A network analysis of Sibiu County, Romania. *Annals of Tourism Research*, 47, 89–93. <https://doi.org/10.1016/j.annals.2014.04.002>
- Granovetter, M. S. (1973). The Strength of Weak Ties. *American Journal of Sociology*, 78 (6), 1360–1380. <http://www.jstor.org/stable/2776392>.
- Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17(S2), 109–122.
- Grant, R. M., & Baden-Fuller, C. (2005). A knowledge accessing theory of strategic alliances. *Journal of Management Studies*, 41(1), 61–84.
- Hardy, A., Vorobjovas-Pinta, O., & Eccleston, R. (2018). Enhancing knowledge transfer in tourism: An elaboration likelihood model approach. *Journal of Hospitality and Tourism Management*, 37, 33–41.
- Hernández, J. M., & González-Martel, C. (2017). An evolving model for the lodging-service network in a tourism destination. *Physica A: Statistical Mechanics and its Applications*, 482, 296–307.
- Hong, T., Ma, T., & Huan, T.-C. T. (2015). Network behavior as driving forces for tourism flows. *Journal of Business Research*, 68(1), 146–156.
- Hornung, J. M. (2015). *Revisiting Media Richness Theory: Social Cues Impact on Understanding in a Textual World*. Pace University. Available from ProQuest Central; ProQuest Dissertations & Theses Global. Retrieved from <https://search.proquest.com/docview/1714139901?accountid=10675>.
- Huggins, R., & Johnston, A. (2010). Knowledge flow and inter-firm networks: The influence of network resources, spatial proximity and firm size. *Entrepreneurship & Regional Development*, 22(5), 457–484.
- Inkpen, A. C., & Tsang, E. W. (2005). Social capital, networks, and knowledge transfer. *Academy of Management Review*, 30(1), 146–165.
- Ipe, M. (2003). Knowledge sharing in organizations: A conceptual model. *Human Resource Development Review*, 2(4), 337–359.
- Iqbal, M., Yanuarni, E., Mawardi, M. K., & Astuti, E. S. (2023). Linking knowledge management to tourism business of smes in aftermath of disaster: Implications for open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 9 (2), Article 100054. <https://doi.org/10.1016/j.joitmc.2023.100054>
- Jaakkola, E. (2020). Designing conceptual articles: Four approaches. *AMS Review*, 10 (1–2), 18–26. <https://doi.org/10.1007/s13162-020-00161-0>
- Jeong, H., Neda, Z., & Barabási, A.-L. (2003). Measuring preferential attachment in evolving networks. *EPL (Europhysics Letters)*, 61(4), 567.
- Jiafu, S., Yu, Y., & Tao, Y. (2018). Measuring knowledge diffusion efficiency in R&D networks. *Knowledge Management Research and Practice*, 16(2), 208–219.
- Karampela, S., Kavroudis, D., & Kizos, T. (2017). Agritourism networks: Empirical evidence from two case studies in Greece. *Current Issues in Tourism*, 1–20.
- Kc, B., Morais, D. B., Seekamp, E., Smith, J. W., & Peterson, M. N. (2018). Bonding and Bridging Forms of Social Capital in Wildlife Tourism Microentrepreneurship: An Application of Social Network Analysis. *Sustainability*, 10(2), 315.
- KC, B., Morais, D. B., Peterson, M. N., Seekamp, E., & Smith, J. W. (2019). Social network analysis of wildlife tourism microentrepreneurial network. *Tourism and Hospitality Research*, 19(2), 158–169. <https://doi.org/10.1177/1467358417715679>
- Khalilzadeh, J. (2018). Demonstration of exponential random graph models in tourism studies: Is tourism a means of global peace or the bottom line? *Annals of Tourism Research*, 69, 31–41.
- Kim, N., & Shim, C. (2018). Social capital, knowledge sharing and innovation of small-and medium-sized enterprises in a tourism cluster. *International Journal of Contemporary Hospitality Management*, 30(6), 2417–2437. <https://doi.org/10.1108/ijchm-07-2016-0392>
- Kim, Y.-R., & Scott, N. (2018). Network dynamics of tourism development in South Korea. *Current Issues in Tourism*, 21(11), 1239–1259.
- Kimbu, A. N., & Ngoasong, M. Z. (2013). Centralised decentralisation of tourism development: A network perspective. *Annals of Tourism Research*, 40, 235–259.
- Knoben, J., & Oerlemans, L. A. (2006). Proximity and inter-organizational collaboration: A literature review. *International Journal of Management Reviews*, 8(2), 71–89.
- Kofler, I., Marcher, A., Volgger, M., & Pechlaner, H. (2018). The special characteristics of tourism innovation networks: The case of the Regional Innovation System in South Tyrol. *Journal of Hospitality and Tourism Management*, 37, 68–75.
- Lakshman, C., Rai, S., & Lakshman, S. (2021). Knowledge sharing, organizational commitment and turnover intention among knowledge workers: A knowledge-based perspective. *Journal of Asia Business Studies*, 16(5), 768–785. <https://doi.org/10.1108/jabs-07-2020-0277>
- Lane, P. J., & Lubatkin, M. (1998). Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*, 19(5), 461–477.
- Latora, V., & Marchiori, M. (2001). Efficient behavior of small-world networks. *Physical Review Letters*, 87(19). <https://doi.org/10.1103/physrevlett.87.198701>
- Lawson, B., & Potter, A. (2012). Determinants of knowledge transfer in inter-firm new product development projects. *International Journal of Operations & Production Management*, 32(10), 1228–1247.
- Levin, D. Z., & Cross, R. (2004). The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management Science*, 50(11), 1477–1490.
- Li, J., Yang, M., & Pan, B. (2015). Network analysis of navigation paths of Tourists' trip planning and power structure of the online tourism in China. *Asia Pacific Journal of Tourism Research*, 20(sup1), 1451–1465.
- Li, Y., Shi, D., Li, X., & Wang, W. (2015). Influencing factors of knowledge dissemination in rural areas in China. *Nankai Business Review International*, 6(2), 128–155.
- Liu, B., Huang, S. S., & Fu, H. (2017). An application of network analysis on tourist attractions: The case of Xinjiang, China. *Tourism Management*, 58, 132–141.
- Lopes, J., Oliveira, M., Lopes, J., & Zaman, U. (2021). Networks, innovation and knowledge transfer in tourism industry: An empirical study of smes in Portugal. *Social Sciences*, 10(5), 159. <https://doi.org/10.3390/socsci10050159>
- Lozano, S., & Gutiérrez, E. (2018). A complex network analysis of global tourism flows. *International Journal of Tourism Research*, 20(5), 588–604. <https://doi.org/10.1002/jtr.2208>.
- Luo, Q., & Zhong, D. (2015). Using social network analysis to explain communication characteristics of travel-related electronic word-of-mouth on social networking sites. *Tourism Management*, 46, 274–282.
- Luthe, T., & Wyss, R. (2016). Resilience to climate change in a cross-scale tourism governance context: a combined quantitative-qualitative network analysis. *Ecology and Society*, 21(1).
- Luthe, T., Wyss, R., & Schuckert, M. (2012). Network governance and regional resilience to climate change: Empirical evidence from mountain tourism communities in the Swiss Gotthard region. *Regional Environmental Change*, 12(4), 839–854.
- MacInnis, D. J. (2011). A framework for conceptual contributions in marketing. *Journal of Marketing*, 75(4), 136–154.
- Marasco, A., De Martino, M., Magnotti, F., & Morvillo, A. (2018). Collaborative innovation in tourism and hospitality: a systematic review of the literature. *International Journal of Contemporary Hospitality Management*, 30(6), 2364–2395. <https://doi.org/10.1108/IJCHM-01-2018-0043>.
- Marsden, P. V. (1990). Network data and measurement. *Annual Review of Sociology*, 435–463.
- Martínez-Martínez, A., Cegarra-Navarro, J. G., & García-Pérez, A. (2022). Sustainability knowledge management and organisational learning in tourism: Current approaches and areas for future development. *Journal of Sustainable Tourism*, 31(4), 895–907. <https://doi.org/10.1080/09669582.2022.2086560>
- Martinkenaite, I. (2011). Antecedents and consequences of inter-organizational knowledge transfer: Emerging themes and openings for further research. *Baltic Journal of Management*, 6(1), 53–70.
- McCleod, M., Chambers, D., & Airey, D. (2018). A comparative analysis of tourism policy networks. *Tourism Management in Warm-water Island Destinations*, 77.

- McLeod, M. (2020). Understanding knowledge flows within a tourism destination network. *Journal of Hospitality and Tourism Insights*, 3(5), 549–566. <https://doi.org/10.1108/jhti-02-2020-0017>
- McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, 415–444.
- McTiernan, C., Musgrave, J., & Cooper, C. (2021). Conceptualising trust as a mediator of pro-environmental tacit knowledge transfer in small and medium sized tourism enterprises. *Journal of Sustainable Tourism*, 31(4), 1014–1031. <https://doi.org/10.1080/09669582.2021.1942479>
- Mentzas, G., Apostolou, D., Kafentzis, K., & Georgolios, P. (2006). Inter-organizational networks for knowledge sharing and trading. *Information Technology and Management*, 7(4), 259–276.
- Muscio, A. (2007). The impact of absorptive capacity on SMEs' collaboration. *Economics of Innovation and New Technology*, 16(8), 653–668.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242–266.
- Newman, M. E. (2002). Assortative mixing in networks. *Physical Review Letters*, 89(20), Article 208701.
- Newman, M. E. (2006). Modularity and community structure in networks. *Proceedings of the national academy of sciences*, 103(23), 8577–8582.
- Nogueira, S., & Pinho, J. C. (2015). Stakeholder network integrated analysis: The specific case of rural tourism in the Portuguese Peneda-Gerês National Park. *International Journal of Tourism Research*, 17(4), 325–336.
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization science*, 5(1), 14–37.
- Nonaka, I. (2005). *Knowledge management: critical perspectives on business and management*, (Vol. 2): Taylor & Francis.
- Nonaka, I. (2008). *The Knowledge-Creating Company*. Harvard Business Review Press.
- Nooteboom, B. (1999). Innovation and inter-firm linkages: new implications for policy. *Research policy*, 28(8), 793–805.
- Nooteboom, B. (2000). Learning by interaction: Absorptive capacity, cognitive distance and governance. *Journal of Management and Governance*, 4(1–2), 69–92.
- Novotny, M., Dodds, R., & Walsh, P. R. (2024). The destination marketing organization as an intelligent agent: Evaluating engagement in knowledge management practices. *International Journal of Tourism Research*, 26(1). <https://doi.org/10.1002/jtr.2605>
- Ogutu, H., Adol, G. F. C., Bujdosó, Z., Andrea, B., Fekete-Farkas, M., & Dávid, L. D. (2023). Theoretical nexus of knowledge management and tourism business enterprise competitiveness: An integrated overview. *Sustainability*, 15(3), 1948. <https://doi.org/10.3390/su15031948>
- Paulin, D., & Suneson, K. (2012). Knowledge transfer, knowledge sharing and knowledge barriers—three blurry terms in KM. *The Electronic Journal of Knowledge Management*, 10(1), 81–91.
- Pavlovich, K. (2003). The evolution and transformation of a tourism destination network: The Waitomo caves, New Zealand. *Tourism Management*, 24(2), 203–216. [https://doi.org/10.1016/s0261-5177\(02\)00056-0](https://doi.org/10.1016/s0261-5177(02)00056-0)
- Pavlovich, K. (2014). A rhizomic approach to tourism destination evolution and transformation. *Tourism Management*, 41, 1–8. <https://doi.org/10.1016/j.tourman.2013.08.004>
- Pedersen, T., Petersen, B., & Sharma, D. (2003). Knowledge transfer performance of multinational companies. In *Governing Knowledge-Processes* (pp. 69–90). Springer.
- Peng, H., Zhang, J., Liu, Z., Lu, L., & Yang, L. (2016). Network analysis of tourist flows: A cross-provincial boundary perspective. *Tourism Geographies*, 18(5), 561–586.
- Perkins, R., Khoo, C., & Arcodia, C. (2022). Stakeholder contribution to tourism collaboration: Exploring stakeholder typologies, networks and actions in the cluster formation process. *Journal of Hospitality and Tourism Management*, 52, 304–315. <https://doi.org/10.1016/j.jhtm.2022.07.011>
- Perkins, R., Khoo-Lattimore, C., & Arcodia, C. (2021). Collaboration in marketing regional tourism destinations: Constructing a business cluster formation framework through participatory action research. *Journal of Hospitality and Tourism Management*, 46, 347–359. <https://doi.org/10.1016/j.jhtm.2021.01.004>
- Perles-Ribes, J. F., Rodríguez-Sánchez, I., & Rodríguez, A. B. R. (2017). Is a cluster a necessary condition for success? The case of Benidorm. *Current Issues in Tourism*, 20(15), 1575–1603. <https://doi.org/10.1080/13683500.2015.1043247>
- Phelps, C., Heidl, R., & Wadhwa, A. (2012). Knowledge, networks, and knowledge networks a review and research agenda. *Journal of Management*, 38(4), 1115–1166.
- Piazza, R., Baggio, R., Neidhardt, J., & Werthner, H. (2011). Destinations and the web: A network analysis view. *Information Technology & Tourism*, 13(3), 215–228.
- Polanyi, M. (1966). The logic of tacit inference. *Philosophy*, 41(155), 1–18.
- Polanyi, M. (1967). *The Tacit Dimension*. New York: Doubleday.
- Pook, A. S. Y., Chong, C. W., & Yuen, Y. Y. (2017). Effectiveness of cross-border knowledge transfer in Malaysian MSC status corporations. *Knowledge Management & E-Learning: An International Journal (KM&EL)*, 9(1), 90–110.
- Priestley, J. L. (2003). *Inter-Organizational Knowledge Transfer Difficulty: The Influence of Organizational Network Type, Absorptive Capacity, Causal Ambiguity and Outcome Ambiguity*. College of Business, Georgia State University.
- Provenzano, D., Hawelka, B., & Baggio, R. (2018). The mobility network of European tourists: A longitudinal study and a comparison with geo-located twitter data. *Tourism Review*, 73(1), 28–43.
- Raisi, H., Baggio, R., Barratt-Pugh, L., & Willson, G. (2018). Hyperlink network analysis of a tourism destination. *Journal of Travel Research*, 57(5), 671–686.
- Raisi, H., Baggio, R., Barratt-Pugh, L., & Willson, G. (2020). A network perspective of knowledge transfer in tourism. *Annals of Tourism Research*, 80, Article 102817.
- Raisi, H., Barratt-Pugh, L., Baggio, R., Willson, G., Huang, S., & Esfandiari, K. (2024). Developing a weighted model to measure knowledge diffusion in a tourism destination network. *Asia Pacific Journal of Tourism Research*, 29(4), 477–494. <https://doi.org/10.1080/10941665.2024.2335253>
- Rastegar, R., & Ruhanen, L. (2021). A safe space for local knowledge sharing in sustainable tourism: An organisational justice perspective. *Journal of Sustainable Tourism*, 1–17.
- Ravasz, E., & Barabási, A.-L. (2003). Hierarchical organization in complex networks. *Physical Review E*, 67(2), Article 026112.
- Reagans, R., & McEvily, B. (2003). Network structure and knowledge transfer: The effects of cohesion and range. *Administrative Science Quarterly*, 48(2), 240–267.
- Reed, R., & DeFillippi, R. J. (1990). Causal ambiguity, barriers to imitation, and sustainable competitive advantage. *Academy of Management Review*, 15(1), 88–102.
- Rehman, S. U., Bresciani, S., Ashfaq, K., & Alam, G. M. (2022). Intellectual capital, knowledge management and competitive advantage: A resource orchestration perspective. *Journal of Knowledge Management*, 26(7), 1705–1731.
- Ritsiri, U., & Meeprom, S. (2020). Does knowledge management practice produce accounting employee productivity in the tourism business in Thailand? *Anatolia*, 31(1), 99–110. <https://doi.org/10.1080/13032917.2019.1708424>
- Rodan, S., & Galunic, C. (2004). More than network structure: How knowledge heterogeneity influences managerial performance and innovativeness. *Strategic Management Journal*, 25(6), 541–562.
- Ruhanen, L., & Cooper, C. (2018). Tourism research and knowledge transfer. In *Handbook of Research Methods for Tourism and Hospitality Management*. Edward Elgar Publishing.
- Sainaghi, R., & Baggio, R. (2017). Complexity traits and dynamics of tourism destinations. *Tourism Management*, 63, 368–382.
- Sako, M. (1991). The role of trust in Japanese buyer-supplier relationships. *Ricerche Economiche*, 45(2–3), 449–474.
- Schaffer, V., & Lawley, M. (2012). An analysis of the networks evolving from an artificial reef development. *Current Issues in Tourism*, 15(5), 497–503.
- Scott, J. (2017). *Social Network Analysis*. Sage.
- Scott, N., Baggio, R., & Cooper, C. (2008). *Network Analysis and Tourism: From Theory to Practice* (Vol. 35). Channel View Publications.
- Scott, N., Van Niekerk, M., & de Martino, M. (2017). *Knowledge Transfer to and Within Tourism: Academic, Industry and Government Bridges*. Emerald Group Publishing.
- Seppänen, R., Blomqvist, K., & Sundqvist, S. (2007). Measuring inter-organizational trust—A critical review of the empirical research in 1990–2003. *Industrial Marketing Management*, 36(2), 249–265.
- Shekhar, S. (2016). Determinants of successful knowledge transfers. In *Managing the Reality of Virtual Organizations* (pp. 133–154). Springer.
- Shen, Y., Morrison, A. M., Wu, B., Park, J., Li, C., & Li, M. (2014). Where in the world? A geographic analysis of a decade of research in tourism, hospitality, and leisure journals. *Journal of Hospitality and Tourism Research*, 42(2), 171–200.
- Simonin, B. L. (1999). Ambiguity and the process of knowledge transfer in strategic alliances. *Strategic Management Journal*, 20(7), 595–623.
- Situmorang, R., & Japutra, A. (2024). Knowledge transfer within mnc hotel subsidiaries: An absorptive capacity perspective. *Tourism Management*, 100, Article 104794. <https://doi.org/10.1016/j.tourman.2023.104794>
- Sørensen, F., & Mattsson, J. (2016). Speeding up innovation: Building network structures for parallel innovation. *International Journal of Innovation Management*, 20(02), Article 1650024.
- Soteriades, M. (2012). Tourism destination marketing: Approaches improving effectiveness and efficiency. *Journal of Hospitality and Tourism Technology*, 3(2), 107–120. <https://doi.org/10.1108/17579881211248781>
- Spender, J. C. (2015). Knowledge management: Origins, history, and development. In *Advances in Knowledge Management* (pp. 3–23). Springer.
- Stienmetz, J. L., & Fesenmaier, D. R. (2015). Estimating value in Baltimore, Maryland: An attractions network analysis. *Tourism Management*, 50, 238–252.
- Su, J., Yang, Y., & Zhang, N. (2017). Measurement of knowledge diffusion efficiency for the weighted knowledge collaboration networks. *Kybernetes*, 46(4), 672–692.
- Sveiby, K. E. (1997). *The New Organizational Wealth: Managing & Measuring Knowledge-Based Assets*. Berrett-Koehler Publishers.
- Swanson, E., Kim, S., Lee, S. M., Yang, J. J., & Lee, Y. K. (2020). The effect of leader competencies on knowledge sharing and job performance: Social capital theory. *Journal of Hospitality and Tourism Management*, 42, 88–96.
- Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17(S2), 27–43.
- Thomas, R., & Wood, E. (2014). Innovation in tourism: Re-conceptualising and measuring the absorptive capacity of the hotel sector. *Tourism Management*, 45, 39–48.
- Thomas, R., & Wood, E. (2015). The absorptive capacity of tourism organisations. *Annals of Tourism Research*, 54, 84–99.
- Tran, M. T., Jeeva, A. S., & Pourabedin, Z. (2016). Social network analysis in tourism services distribution channels. *Tourism Management Perspectives*, 18, 59–67.
- Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal*, 41(4), 464–476.
- Tuomi, I. (1999). Data is more than knowledge: Implications of the reversed knowledge hierarchy for knowledge management and organizational memory. In *Paper Presented at the Systems Sciences, 1999. HICSS-32. Proceedings of the 32nd Annual Hawaii International Conference on*.
- Ubeda-García, M., Rienda, L., Zaragoza-Saez, P. C., & Andreu-Guerrero, R. (2021). The impact of knowledge management on the internationalization, organizational ambidexterity and performance of Spanish hotel chains. *International Journal of Contemporary Hospitality Management*, 33(5), 1507–1531.
- Valeri, M., & Baggio, R. (2021). Increasing the efficiency of knowledge transfer in an Italian tourism system: A network approach. *Current Issues in Tourism*, 25(13), 2127–2142. <https://doi.org/10.1080/13683500.2021.1937960>

- Van Der Zee, E., & Vanneste, D. (2015). Tourism networks unravelled; a review of the literature on networks in tourism management studies. *Tourism Management Perspectives*, 15, 46–56.
- Van Wijk, R., Jansen, J. J., & Lyles, M. A. (2008). Inter-and intra-organizational knowledge transfer: A Meta-analytic review and assessment of its antecedents and consequences. *Journal of Management Studies*, 45(4), 830–853.
- Veiga, P., Fernandes, C., & Ambrósio, F. (2022). Knowledge spillover, knowledge management and innovation of the portuguese hotel industry in times of crisis. *Journal of Hospitality and Tourism Insights*, 6(4), 1521–1534. <https://doi.org/10.1108/jhti-08-2021-0222>
- Wang, S., & Noe, R. A. (2010). Knowledge sharing: a review and directions for future research. *Human Resource Management Review*, 20(2), 115–131. <https://doi.org/10.1016/j.hrmr.2009.10.001>
- Wang, X. (2013). Forming mechanisms and structures of a knowledge transfer network: Theoretical and simulation research. *Journal of Knowledge Management*, 17(2), 278–289.
- Ward, S. F., & Peláez-Verdet, A. (2018). A network analysis of the academic publications on tourism. *International Journal of Information Systems and Tourism (IJIST)*, 3(1), 57–67.
- Watts, D. J., & Strogatz, S. H. (1998). Collective dynamics of 'small-world' networks. *Nature*, 393(6684), 440–442.
- Wei, J., Zheng, W., & Zhang, M. (2011). Social capital and knowledge transfer: A multi-level analysis. *Human Relations*, 64(11), 1401–1423. <https://doi.org/10.1177/0018726711417025>
- Weidenfeld, A. (2013). Tourism and cross border regional innovation systems. *Annals of Tourism Research*, 42, 191–213.
- Weidenfeld, A., Williams, A. M., & Butler, R. W. (2010). Knowledge transfer and innovation among attractions. *Annals of Tourism Research*, 37(3), 604–626.
- Werner, K., Dickson, G., & Hyde, K. F. (2015). Learning and knowledge transfer processes in a mega-events context: The case of the 2011 Rugby world cup. *Tourism Management*, 48, 174–187.
- Williams, N. L., Inversini, A., Ferdinand, N., & Buhalis, D. (2017). Destination eWOM: A macro and meso network approach? *Annals of Tourism Research*, 64, 87–101.
- Windsperger, J., & Gorovaia, N. (2011). Knowledge attributes and the choice of knowledge transfer mechanism in networks: The case of franchising. *Journal of Management and Governance*, 15(4), 617–640.
- Wyss, R., Luthé, T., & Abegg, B. (2015). Building resilience to climate change—the role of cooperation in alpine tourism networks. *Local Environment*, 20(8), 908–922.
- Xu, Q., & Ma, Q. (2008). Determinants of ERP implementation knowledge transfer. *Information & Management*, 45(8), 528–539.
- Ying, T., Norman, W. C., & Zhou, Y. (2016). Online networking in the tourism industry: A webometrics and hyperlink network analysis. *Journal of Travel Research*, 55(1), 16–33. <https://doi.org/10.1177/0047287514532371>
- Young-Ybarra, C., & Wiersema, M. (1999). Strategic flexibility in information technology alliances: The influence of transaction cost economics and social exchange theory. *Organization Science*, 10(4), 439–459.
- Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27(2), 185–203.
- Zander, U., & Kogut, B. (1995). Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test. *Organization Science*, 6(1), 76–92.
- Zehrer, A. (2011). Knowledge management in tourism—the application of Grant's knowledge management model to Austrian tourism organizations. *Tourism Review*, 66(3), 50–64.



Hossein Raisi is a PhD holder in the School of Business and Law at Edith Cowan University. His main interests are in the application of network analysis methods and knowledge management in tourism.



Kourosh Esfandiari* is a Postdoc Research Fellow at School of Business and Law, Edith Cowan University. His research focuses on sustainable tourism, particularly addressing the SDG 11 (sustainable cities and communities), SDG 12 (responsible consumption and production) and SDG 17 (partnerships for the goals) in the travel and tourism sector.



Llandis Barratt-Pugh is an Honorary Research Fellow at UWA. He has authored more than 100 publications, with 60 refereed papers and articles, and supervised 30 higher degree candidates. He managed two national ARC, four NCVER, and 14 industry funded research studies. He was presented with the national Ray Barker award for distinguished VET research in 2023, and is one of just 5 recipients. He was President of AVETRA from 2010/13 and is current executive Treasurer co-managing a \$400 k grant from the Victorian Skills Authority. His interest is in managing learning in a wide range of domains. He managed a large VET UK organization winning two UK national Training Awards. As Associate Dean Research and MBA lecturer for ECU Business Faculty, Llandis twice gained University awards for exceptional teaching and learning.



Gregory Willson is a Senior Lecturer in the School of Business and Law at Edith Cowan University, Perth, Western Australia. His research interests are primarily focused on critical tourism research, ill-health, disability and travel, spirituality, heritage, and environment-based tourism.



Rodolfo Baggio is a professor at the Master in Economics and Tourism, Bocconi University, Milan, Italy. He actively researches on the use of information technology in tourism and on the application of quantitative network analysis methods to the study of tourism destinations.