

Knowledge attributes and the choice of knowledge transfer mechanism in networks: the case of franchising

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Abstract In this paper we develop a knowledge-based view on the choice of knowledge transfer mechanisms in franchising that integrates results from the information richness theory. Starting from the information richness theory we argue that tacitness of system knowledge, operationalized by codifiability, teachability and complexity, determines the information richness of the knowledge transfer mechanisms of franchising firms. We examine the following hypotheses: (1) If the franchisor's knowledge is characterized by a high degree of codifiability and teachability and a low degree of complexity, knowledge transfer mechanisms with a lower degree of information richness are used; (2) If the franchisor's knowledge is characterized by a high degree of complexity and a low degree of codifiability and teachability, knowledge transfer mechanisms with a higher degree of information richness are used. We test these hypotheses by using data from 52 franchising firms in the Austrian franchise sector. The data provide support for the hypotheses.

Keywords Knowledge transfer · Information richness · Knowledge-based view of the firm · Tacitness of knowledge · Franchising

1 Introduction

The success of networks, such as franchising networks, strategic alliances, joint ventures and clusters, is highly dependent on the ability to create and transfer knowledge within the network (e.g. Albino et al. 1999; Maskell and Malmberg

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1999; Hult et al. 2004; Mu et al. 2008). Franchising networks require the transfer of system-specific know-how to franchisees to create a network of successful franchised outlets. Higher efficiency of the network partners results in a higher residual surplus for the whole system. Thus, a successful replication of the business concept by the franchisees and managers of the local outlets is a key to realizing competitive advantage (Argote and Ingram 2000; Winter 1987). This requires an efficient governance of the knowledge transfer from the franchisor to the franchisees. The franchisor can use a variety of transfer mechanisms: Training, conferences, meetings, outlet visits, telephone, committees, fax, intra- and internet and other electronic transfer mechanisms. The paper addresses the issue of the choice of knowledge transfer mechanisms in franchising networks.

In previous years a large number of researchers in organization theory and management examined knowledge transfer within and across organizational boundaries using information (media) richness theory and the knowledge-based view of a firm. The first attempt was the information richness theory that answers the question of how to reduce ambiguity in order to facilitate the transfer of information (Daft and Lengel 1986; Russ et al. 1990; Dennis and Kinney 1998; Sheer and Chen 2004). The knowledge-based view of the firm (Barney 1991; Kogut and Zander 1992, 1993; Nonaka et al. 1996; Connor and Prahalad 1996; Grant 1996) argues that gaining competitive advantage by setting up networks requires effective mechanisms to facilitate inter-organizational transfer of tacit and explicit knowledge (Zander and Kogut 1995; Inkpen 1996; Håkanson 2005). In this paper we develop a knowledge-based view of the choice of knowledge transfer mechanisms that integrates results from the information richness theory. We argue that the information richness theory offers a criterion ('information richness' (IR)) to differentiate knowledge transfer mechanisms according to their information processing (or knowledge transfer) capacity. In franchising, knowledge transfer mechanisms with a relatively higher degree of information richness are training, conference meetings, telephone, and visits of the outlets. Knowledge transfer mechanisms with a relatively lower degree of information richness are fax, email, intra- and internet and other electronic transfer mechanisms. According to the knowledge-based view of the firm, tacitness of knowledge, operationalized by codifiability, teachability and complexity of knowledge, determines IR of the knowledge transfer mechanisms. The thesis of our paper is: the higher the degree of tacitness of the franchisor's system knowledge, the more knowledge transfer mechanisms with a higher degree of IR should be used to facilitate an efficient knowledge transfer from franchisor to franchisees.

The article is organized as follows: section two reviews the relevant literature related to knowledge transfer in networks. In section three we develop the knowledge-based view on the choice of knowledge transfer mechanisms and derive testable hypotheses. Finally, we test the hypotheses that the choice of knowledge transfer mechanisms in franchising depends on the degree of tacitness of system-specific knowledge using data from the Austrian franchise sector.

2 Literature review

Research on information and knowledge transfer in organization started with the information richness theory in the 1980s (Daft and Macintosh 1981; Daft and Lengel 1984, 1986; Trevino et al. 1987; Daft et al. 1987; Russ et al. 1990; Sheer and Chen 2004). According to this view, effective communication requires a fit between task ambiguity/equivocality and ‘richness’ of the communication media. Recent studies extend this view to new electronic communication media (Lim and Benbasat 2000; Buchel and Raub 2001; Sexton et al. 2003; Vickery et al. 2004). However, information richness theory cannot explain the knowledge transfer, because it does not relate the concept of information richness to the characteristics of knowledge.

Since the 1990s many researchers in the field of the knowledge-based view of the firm have examined the problem of internal and inter-organizational knowledge transfer (Kogut and Zander 1992; Nonaka 1994; Szulanski 1995, 2000; Simonin 1999a, b; Argote 1999; Albino et al. 1999; Ancori et al. 2000; Argote et al. 2003; Bresman et al. 1999; Nonaka et al. 2003; Gertler 2003; Jensen and Szulanski 2007; Szulanski and Jensen 2006; Haas and Hansen 2007; van Wijk et al. 2008). Starting from Polanyi’s knowledge concept (Polanyi 1962), they investigated knowledge transfer in organizations and networks. According to the knowledge-based view of the firm, tacitness varies positively with the difficulty of knowledge transfer. On the other hand, most of this literature does not investigate the relationship between knowledge attributes and knowledge transfer mechanisms. Inkpen and Dinur (Inkpen 1996; Inkpen and Dinur 1998) are an exception. They go further by analyzing the relationship between knowledge characteristics and knowledge transfer mechanisms in international joint ventures. However, they do not develop a more general approach that explains the relationship between knowledge types and knowledge transfer mechanisms in networks.

Although franchising has been treated extensively in organization economics, management and marketing in the last decade, the problem of knowledge transfer between the franchisor and franchisees remains largely unexplored (Darr et al. 1995; Paswan and Wittmann 2003; Paswan et al. 2004). Darr et al. (1995) examine the transfer of knowledge between franchisee-owned outlets by using reports, phone calls, personal acquaintances and meetings as transfer mechanisms. The study shows that knowledge is primarily transferred across stores owned by the same franchisee but not across stores within the same network owned by different franchisees. This is because the frequencies of phone calls, personal acquaintances and meetings are significantly higher in the case of stores owned by the same franchisee compared to stores owned by different franchisees. Furthermore, Paswan and Wittmann (2003) argue that franchising firms as network organizations characterized by dense social contacts have the potential to benefit greatly from knowledge created by its distributed network members. This is compatible with Kogut and Zander’s view (Zander and Kogut 1995) who point out that social relations among the network partners may support the transfer of tacit knowledge. However, Paswan et al. do not investigate the problem of the choice of knowledge transfer mechanisms in the network.

In sum, the existing studies have the following deficits: firstly, they do not offer a theoretical framework for the explanation of the knowledge transfer mechanisms in networks. Secondly, they do not develop and test hypotheses about knowledge transfer mechanisms in franchising networks. Starting from this gap, the objective of our paper is to develop a knowledge-based view on the choice of knowledge transfer mechanisms that integrates results from the information richness theory. Our main contribution to the literature is to combine the knowledge-based view with the information richness theory to explain the knowledge transfer mechanisms in franchising networks. Furthermore, our study utilizes primary data from Austrian franchise systems that enables us to estimate the factors which the theory considers important to affect the choice of knowledge transfer mechanism. We present the first empirical evidence that the information richness of knowledge transfer mechanisms in franchising is positively related with tacitness of system-specific knowledge.

3 Theory development

Since our knowledge-based approach uses the concept of information richness to measure the knowledge transfer capacity, we first discuss the main proposition of the information richness theory.

3.1 Information richness theory

The information richness (IR) concept was developed by Lengel and Daft (Daft and Lengel 1984, 1986; Lengel and Daft 1988). IR-theory examines the question, which communication media or mechanisms are effective under different degrees of ambiguity (or equivocality) of the communication task (Daft et al. 1987). An effective information transfer requires a fit between IR of the communication medium and the information processing requirements of the task (Sheer and Chen 2004). The information processing requirements directly vary with task ambiguity. ‘Information richness (IR)’ consists of four attributes of the communication mechanism: feedback capability, availability of multiple cues (voice, body, gestures and words), language variety, and personal focus (emotions, feelings). The more of these attributes a mechanism possesses, the higher is its degree of IR, and the greater is its capacity to handle ambiguity and hence the greater is its knowledge transfer capacity. Communication media with a relatively higher degree of IR refer to face-to-face interactions and team-based mechanisms (meetings, trainings, seminars, workshops, outlet visits and telephone) and communication media with a lower degree of IR refer to written media, manuals, reports, databases, written instructions and electronic media. Face-to-face is the richest communication medium because it has the capacity for direct experience, multiple information cues, immediate feedback and personal focus. Written impersonalized documents, like standardized computer reports, databases, computer prints, are the media with the lowest information richness level. There is no opportunity for feedback and these documents have quantitative nature. The information richness theory can be

summarized by the following proposition: The higher the task ambiguity, the more rich communication media are needed for an effective information transfer.

3.2 A knowledge-based view on the choice of knowledge transfer mechanisms in networks

3.2.1 *Communication media and knowledge transfer mechanisms*

Starting from the IR-theory, first we have to answer the question what is the difference between communication media and knowledge transfer mechanisms. The concept of communication media was developed in the IR-theory. The IR-theory is based on the view of Herbert Simon who defined the organization as an information processing system (Simon 1957; March and Simon 1958). Under this perspective, information refers to explicit knowledge that must be processed and communicated (Kogut and Zander 1993; Nonaka et al. 2000; Antonelli 2006). Organizational routines to transfer information (as explicit knowledge) are called communication media. On the other hand, according to the knowledge-based theory of the firm, which is closely related to the Schumpeterian view, the organization is considered as a system of organizational routines for the creation and transfer of knowledge (Nonaka 1994; Grant 1996; Antonelli 1999). This view focuses both on explicit and tacit knowledge that must be created, processed and transferred. Tacit knowledge is the origin of competitive advantage because it is highly personal, hard to formalize and hence difficult to imitate (Nonaka et al. 1996). Consistent with this knowledge-based view, we use the term knowledge transfer mechanisms for organizational routines that enable the transfer of explicit and tacit knowledge.

3.2.2 *Knowledge attributes and the choice of knowledge transfer mechanisms*

According to the knowledge-based view, the relevant characteristic for the determination of efficient knowledge transfer mechanisms is the degree of tacitness of knowledge. If the knowledge is explicit and hence codifiable, knowledge can be efficiently transferred by using lower-IR-knowledge transfer mechanisms (LIR). If the knowledge is tacit and hence difficult to codify, higher-IR-transfer mechanisms (HIR) are needed to process and transfer the less codifiable component of the knowledge. This is compatible with Teece's view (Teece 1985, 229): "Tacit knowledge is extremely difficult to transfer without ... teaching, demonstration and participation". Therefore, as tacitness of knowledge increases by degree, a larger knowledge transfer capacity and hence more HIR are required for an efficient knowledge transfer. In addition, Berry and Broadbent (1987), Argote (1999) and Almeida and Kogut (1999) argue that high-information rich mechanisms facilitate both the transfer of tacit and explicit knowledge because of the complementarity between tacit and explicit knowledge (Roberts 2000). In sum, the knowledge-based view on the choice of knowledge transfer mechanisms can be stated by the following proposition: The more tacit (explicit) the knowledge is, the more knowledge transfer mechanisms with a higher (lower) degree of IR are needed to facilitate an efficient knowledge transfer.

Fig. 1 Relationship between knowledge transfer mechanisms and knowledge attributes

	<i>LIR</i>	<i>HIR</i>
<i>HIGH Codifiability-Component of System Knowledge</i>	FIT I Postal mailings, fax, email, intra- and internet	MISFIT II
<i>HIGH Tacitness-Component of System Knowledge</i>	MISFIT I	FIT II Training, outlet visits, committees, seminars, meetings, video conferences

Now we apply this approach to the choice of knowledge transfer mechanisms in franchising networks. We start with an example by comparing three knowledge situations and ask the question: which knowledge transfer mechanisms should be used? (see Fig. 1).

First, we assume that the system knowledge of the franchisor is codified in reports, manuals and databases. With a high codifiability-component the system-specific knowledge can be easily transferred by using LIR (for instance postal mailings, fax, intra- and internet and other electronic transfer mechanisms) (see FIT I in Fig. 1). Second, we assume that a large part of the system-specific knowledge is tacit. In this case, most of the franchisor's knowledge and organizational capabilities reside within persons and groups in the franchisor's headquarters and at the outlets. With a high tacitness-component the system-specific knowledge can be only transferred by using HIR (for instance, training, meetings, visits, telephone) (see FIT II in Fig. 1).

If these alignment conditions are not fulfilled, the following inefficiencies may arise (Russ et al. 1990): (a) MISFIT I: if the franchisor's system-specific knowledge is mainly tacit, the knowledge is not efficiently transferred to the franchisees by using LIR. In this case, the franchisees are unable to understand and adequately apply the high tacitness-component of system know-how because it is based on organizational capabilities of employees and groups at the headquarters and at the company-owned outlets. (b) MISFIT II: if the franchisor's knowledge is codifiable, it is not efficiently transferred by using HIR. Although higher-IR-mechanisms facilitate the transfer of codifiable knowledge, it is not efficient because high knowledge transfer costs arise due to the high set-up costs of HIR. In addition, due to behavioural uncertainty the risk of information selection and manipulation increases under personal knowledge transfer mechanisms.

Third, we assume that the system-specific knowledge of the franchisor is partly codifiable and partly tacit. Further we assume that the explicit part is codified in manuals, reports, and databases and additional system-specific knowledge resides within the managers, employees and teams at the franchisor's headquarters and the company-owned outlets. Although codified manuals, reports and databases exist, their utility for franchisees is relatively low because they cannot adequately apply the codified part of the system-specific knowledge because this requires specific

organizational capabilities. If in this case the franchisor only adopts LIR, the franchisees are unable adequately to understand and apply the requisite system-specific knowledge. Consequently, since a large part of the system-specific knowledge to be transferred to the franchisees is characterized by a higher degree of tacitness, LIR are insufficient to facilitate the transfer of the requisite knowledge. In this case, both LIR and HIR are needed to efficiently transfer the system-specific knowledge. For instance, training, visits and meetings would facilitate the transfer of the high tacitness-component of knowledge, thereby also improving the understanding of the more explicit component of the system-specific knowledge.

As a result, the knowledge-based view on the choice of knowledge transfer mechanisms in franchising can be stated as follows: The more explicit the system-specific knowledge of the franchisor is, the more knowledge transfer mechanisms with a lower degree of IR are needed for an efficient knowledge transfer; and the more tacit the system-specific knowledge is, the more knowledge transfer mechanisms with a higher degree of IR are needed for an efficient knowledge transfer. Therefore, the following testable hypotheses can be derived:

H1: if the franchisor's system-specific knowledge is more explicit, more knowledge transfer mechanisms with a lower degree of IR are used.

H2: if the franchisor's system-specific knowledge is more tacit, more knowledge transfer mechanisms with a higher degree of IR are used.

4 Empirical analysis

4.1 Sample and data collection

The empirical setting for testing these hypotheses is the franchising sector in Austria. We started our empirical work by obtaining the list of all franchise systems in Austria from the Austrian Franchise Association (AFA). AFA identified a total of 234 franchised systems in Austria in 2007. After several preliminary steps in questionnaire development, including interviews with franchisors and franchise consultants and the representatives of the AFA, the final version of the questionnaire was sent out by mail to the general managers of the franchise systems in October 2007 and February 2008. The questionnaire took approximately 10 min to complete on average. We received 52 completed responses; hence the response rate is 22.6%. The general managers as respondents to the survey were the key informants of the franchise systems. Key informants should occupy roles that make them knowledgeable about the issues being researched (John and Reve 1982). Since the general managers as top decision makers in the franchise systems are involved in all organizational decisions (including the design of the knowledge transfer mechanisms), they were judged to be the most suitable respondents.

In implementing the survey we took several steps to ensure a good response rate, ranging from including a support letter from the president of the Austrian Franchise Association to conducting multiple follow ups with non-respondents (Fowler 1993). We examined the non-response bias by investigating whether the results obtained

from analysis were driven by differences between the group of respondents and the group of non-respondents. Non-response bias was estimated by comparing early versus late respondents (Armstrong and Overton 1977), where late respondents serve as proxies for non-respondents. No significant differences emerged between the two groups of respondents.

In addition, we checked for common method bias. Based on Podsakoff and Organ (1986) and Podsakoff et al. (2003), we used Harman's single-factor test (Harman 1967) to examine whether a significant amount of common method variance exists in the data. After we conducted factor analysis on all items and extracted more than one factor with eigenvalues greater than one, we felt confident that common method variance is not a serious problem in our study.

4.2 Measurement

To test the hypotheses the following variables are important: Information richness of knowledge transfer mechanisms, tacitness of system knowledge, and control variables (see "Appendix").

4.2.1 Information richness

Adapted from Daft and Lengel (1984) and Vickery et al. (2004), we differentiate the following knowledge transfer mechanisms in franchising (see Fig. 2): Face-to-face (training, meetings, visits), telephone, electronic media (emails, intra- and internet), written personal letters, written formal documents and manuals, numeric formal media (computer output). Face-to-face is the knowledge transfer mechanism with the highest information richness and numeric formal media with the lowest information richness. This hierarchy of information richness is confirmed by empirical research (D'Ambra et al. 1998). Our research focuses on face-to-face (trainings, seminars and workshops, council and committee meetings, formal meetings between franchisors and franchisees), and electronic media (intra- and internet, email). Consistent with IR-hierarchy, we differentiate knowledge transfer mechanisms with a relatively higher degree of information richness (trainings, seminars and workshops, council and committee meetings, formal meetings between franchisors and franchisees) and knowledge transfer mechanisms with a relatively lower degree of information richness (email, intra- and internet).

Fig. 2 Information richness of knowledge transfer mechanisms. Note: Adapted from Daft and Lengel (1984) and Vickery et al. (2004)

Communication Medium	Increasing Information Richness
Face-to-Face (training, meetings, visits)	↑
Telephone	
Electronic (email, intra- and internet)	
Written personal (letters, fax)	
Written formal (documents, manuals)	
Numeric formal (accounting data)	

Therefore, our study operationalizes information richness in accordance with Daft and Lengel's approach.

Information richness is measured by the extent to which the franchisors use email, intra- and internet, trainings, meetings between franchisors and franchisees, conferences and workshops, committees and councils. The franchisors were asked to rate the use of these mechanisms on a seven-point scale. The higher the score, the higher is the franchisor's use of a certain mechanism. We construct indicators for LIR with intranet, internet and email and for HIR with annual training, seminars and workshops, meetings between franchisors and franchisees, council and committee meetings. Based on the information richness theory, we use formative indicators representing the domain of the content of HIR and LIR (Diamantopoulos and Winkelhofer 2001). Since formative indicators influence the construct, "internal consistency reliability is not an appropriate standard for evaluating the adequacy of the measures" (Jarvis, Mackenzie and Podsakoff 2003, 202). This implies that dropping a causal indicator, due to low item-to-total correlations, may change the meaning by restricting the domain of the composite construct.

4.2.2 Knowledge attributes

According to the knowledge-based view, tacitness of system-specific knowledge determines the use of knowledge transfer mechanisms. Following Winter's (1987) taxonomy of knowledge and Kogut and Zander's argument (Kogut and Zander 1993; Zander and Kogut 1995), we use the following knowledge attributes to measure the latent construct of tacitness of knowledge: codifiability, teachability and complexity. Codifiability (COD) is the degree to which knowledge can be encoded and written down in manuals. When codifiability is high, the system knowledge is considered more explicit. Teachability (TEACH) is the extent to which knowledge can be transferred through training, demonstration, participation. As Winter (1987) and Teece (1985) point out, transfer of tacit knowledge, if possible at all, requires teaching, demonstration and participation. Teachability is high when the system knowledge can be taught to the franchisees. However, if the system-specific knowledge of the franchisor cannot be taught due to its high degree of tacitness, the franchisees cannot acquire and apply the requisite knowledge to efficiently manage the local outlets. Hence highly-tacit, non-transferable system-specific knowledge cannot be used in franchising networks. Kogut and Zander (1993, p. 633) define complexity (COMPLEX) "as the number of critical and interacting elements embraced by an entity or activity". Similarly, Sorenson et al. (2006) define complexity in terms of the level of interdependence inherent in the subcomponents of a piece of knowledge (see also Simonin 1999a, b). When the system-specific knowledge is more complex, it is considered more tacit. Applied to franchising, complexity is high when the application of the system-specific knowledge by the franchisees requires a large number of heterogeneous, complicated and interdependent tasks, and when the franchisees have to master diverse techniques in order to successfully apply the system-specific knowledge.

Adapted from Zander and Kogut (1995), we use a battery of nine items to measure codifiability, teachability and complexity of system-specific knowledge.

Table 1 Factor analysis

Knowledge attributes ^a	Varimax rotated factor loadings ^b		
	Factor 1 (Complexity)	Factor 2 (Teachability)	Factor 3 (Codifiability)
Complex 1: Franchisees must master many diverse activities and tasks, in order to be able to apply the system knowledge successfully	0.840		
Complex 2: Activities and tasks for the application of system know-how are very complex	0.828		
Complex 3: Activities and tasks for the application of system know-how are very heterogeneous	0.674		
Teach 1: Franchisees can easily learn the most important activities of the franchise system by talking to the skilled employees of the headquarters		0.761	
Teach 2: Franchisees can easily learn the most important processes/activities of the franchise system through the personal support of the skilled employees of the headquarters		0.725	
Teach 3: The employees of the franchisee can master the new knowledge through training		0.679	
Teach 4: Training of franchisees to apply new knowledge is a quick and easy job		0.669	
Cod 1: Large parts of the business processes between the headquarters and the outlets can be carried out by using information technology			0.848
Cod 2: Critical parts of the business processes in the franchise system can be comprehensively documented in written form			0.654
Eigenvalues	2.671	2.211	1.055
Cum. variance explained (%)	26.692	50.378	65.959

^a The scales were anchored with 1, strongly disagree;...7, strongly agree (see appendix)

^b Factor analysis resulted in three factors with eigenvalues larger than 1.0

We conducted a factor analysis to check for their dimensionality. The results of the factor analysis show that the items load on three factors referring to codifiability, teachability and complexity. The three factors capture 65,959% of the variance and meet the general criteria for factor retention (Hair et al. 1998) (see Table 1). Reliabilities of the final scales for COMPLEX and TEACH pass the threshold of 0.7; Cronbach alpha for COD is only 0.57. However, according to (Pedhazur and Schmelkin 1991, p. 109), the use of the constructs with lower reliability can be justified in the earlier stages of research. Higher reliabilities are usually required when the measure is used to determine differences among groups, and very high reliabilities are essential when scores are used for making decisions about individuals. Therefore, reliabilities above 0.5 can be viewed as acceptable (see also John and Benet-Martinez 2000).

To check convergent and discriminant validity of the constructs we estimated the average intraconstruct correlation as a “within measure” and the average correlation

Table 2 Average within/ between correlations

	COD	TEACH	COMPLEX
COD	0.429		
TEACH	0.210	0.367	
COMPLEX	0.156	-0.085	0.499

of each construct's items with each other construct's items as a "between measure". The results are presented in the Table 2. The "within" average correlations presented on a diagonal line are higher than the "between" average correlations, proving the discriminant validity of these constructs.

4.2.3 Control variables

Trust (TRUST): under the relational view of governance (Zaheer and Venkatraman 1995; Dyer and Singh 1998; Levin and Cross 2004; Gulati and Nickerson 2007; Mellwig et al. 2007), there are two perspectives on the impact of trust on the use of formal knowledge transfer mechanisms: (a) Substitutability view: Trust is a substitute for the use of formal knowledge transfer mechanisms (Gulati 1995; Poppo and Zenger 2002; Yu et al. 2006). It mitigates the knowledge transfer hazards, due to lower relational risk (Roberts 2000), and hence reduces the extent of formal knowledge transfer mechanisms (Lo and Lie 2008). Consequently, the franchisors are likely to use less HIR and more LIR when trust exists between the network partners, and they use more HIR and less LIR when mistrust exists. (b) Complementarity view: Trust overcomes communication barriers and facilitates knowledge sharing and increases the use of all knowledge transfer mechanisms (Seppänen et al. 2007; Blomqvist et al. 2005; Bohnet and Baytelman 2007). Consequently, with a high level of trust the franchisor uses both more HIR and LIR because trust creates an incentive for intense and open communication. TRUST was measured with a three-items scale (see Appendix) (Cronbach alpha = 0.92).

Multi-unit Franchising (MULTI): MULTI measures the impact of multi-unit franchising on the use of knowledge transfer mechanisms between the franchisor and the franchisees. Multi-unit franchising enables the franchisor to delegate to the multi-unit franchisees some tasks concerning the transfer of system knowledge between the local units of the franchisees' multi-unit networks (Bradach 1995, 1997). This requires a lower knowledge transfer capacity at the franchisor's headquarters. Consequently, the more multi-unit franchising is used in a network, the lower is the knowledge transfer requirement between the headquarters and franchisees, and the less knowledge transfer mechanisms are used between the franchisor and the franchisees. We calculated MULTI by dividing the number of franchised outlets by the number of franchisees in the franchise system.

Age of the Franchise Company (AGE): AGE (measured by the number of years since the opening of the first franchise outlet in Austria) is a proxy for interorganizational learning (Gulati and Sytch 2008). The older the franchise company, the more the franchisor can learn about the application of system-specific know how at the local markets, the higher is the tendency toward standardization of

the system-know how, due to the knowledge conversion effect from more tacit to more explicit knowledge (Nonaka 1994; Inkpen 2000), and the less HIR and the more LIR are used.

5 Results

Tables 3 and 4 present the descriptive data for the sample in Austria.

To test the hypotheses 1 and 2 we carry out a regression analysis. We conduct an ordinary least squares regression analysis (OLS) with HIR and LIR as dependent variables measuring the extent of the use of higher-IR-mechanisms and lower-IR-mechanisms. HIR refers to the use of seminars and workshops, trainings, council and committee meetings and formal meetings between the franchisor and the franchisees, and LIR refers to the use of intranet, internet, and email. The franchisors were asked to rate the use of HIR and LIR on a seven-point scale. By averaging the scale values we constructed HIR- and LIR-indicators. We conduct OLS regression analysis (1) without control variables and (2) with control variables. The explanatory variables refer to complexity (COMPLEX), codifiability (COD) and teachability of knowledge (TEACH). Control variables refer to trust (TRUST), age of the franchise system in Austria (AGE), and multi-unit franchising (MULTI). Table 5 presents the correlations of the variables used in the regression analysis. In addition, the variance inflation factors are well below the rule-of-thumb cut-off of 10 (Netter et al. 1985). In sum, we do not find any collinearity indication.

(1) Hypothesis 1: HIR We estimate the following regression equation:

$$\text{HIR} = \alpha + \beta_1 \text{TEACH} + \beta_2 \text{COMPLEX} + \beta_3 \text{COD} + \beta_4 \text{TRUST} \\ + \beta_5 \text{AGE} + \beta_6 \text{MULTI}$$

According to the knowledge-based view, HIR varies positively with complexity (COMPLEX) and negatively with teachability (TEACH) and codifiability (COD). Furthermore, under the substitutability view TRUST is negatively related with the use of HIR, and under the complementarity view TRUST is positively related with the use of HIR. AGE leads to more standardization due to the knowledge conversion

Table 3 Characteristics of the franchise systems (based on the survey of the Austrian Franchise Association 2007)

	N	Minimum	Maximum	Mean	SD
Sector: "0" product and distribution; "1" services	51	0	1	.73	.45
Number of company-owned outlets	49	0	106	7.06	18.92
Number of franchised outlets	51	0	540	32.90	78.67
Number of franchisees	51	0	98	17.41	20.96
Age	52	1	104	20.96	22.94
Multiunit	49	1	10.59	1.46	1.43

Table 4 Descriptive statistics

	Min.	Max.	Mean	SD
Intranet	1	7	4.15	2.40
E-mail	1	7	5.77	1.64
Internet	1	7	3.88	2.39
Annual training	1	7	5.38	1.52
Seminars and workshops	1	7	5.04	1.77
Formal meetings between franchisor and franchisees	1	7	5.79	1.47
Council and committees	1	7	3.65	2.15
COD1: Large parts of the business processes between the headquarters and the outlets can be carried out by using information technology	1	7	5.77	1.49
COD2: Critical parts of the business processes in the franchise system can be comprehensively documented in written form	1	7	4.76	1.87
TEACH1: Franchisees can easily learn the most important activities of the franchise system by talking to the skilled employees of the headquarters	1	6	2.35	1.53
TEACH2: Franchisees can easily learn the most important processes/activities of the franchise system through the personal support of the skilled employees of the headquarters	1	7	2.50	1.58
TEACH3: The employees of the franchisee can master the new knowledge through training	1	7	2.31	1.58
TEACH4: Training of franchisees to apply new knowledge is a quick and easy job	1	7	3.96	1.71
COMPLEX1: Franchisees must master many diverse activities and tasks, in order to be able to apply the system knowledge successfully	1	7	4.78	1.69
COMPLEX2: Activities and tasks for the application of system know-how are very complex	1	6	3.38	1.41
COMPLEX3: Activities and tasks for the application of system know-how are very heterogeneous	1	7	4.31	1.70
TRUST1: There is a great trust between us and franchisees	3	7	6.22	.95
TRUST2: There is an atmosphere of openness and sincerity	1	7	6.27	1.13
TRUST3: The mutual cooperation is on the partnership basis	4	7	6.41	.88
TRUST	3.00	7.00	6.30	.92
COD	1.50	7.00	5.29	1.37
TEACH	2.75	7.00	5.20	1.12
COMPLEX	1.00	6.33	4.21	1.31
HIR	1.75	7.00	4.97	1.34
LIR	1.67	7.00	4.60	1.43

effect and results in the use of less HIR. Multi-unit franchising (MULTI) results in less use of HIR, due to the delegation of system-specific knowledge transfer to the multi-unit franchisees. Table 6 reports the results of regression analysis for HIR. The coefficient of complexity (COMPLEX) is positive and highly significant in both equations. This is consistent with our hypothesis that an increase in the complexity of knowledge implies the use of more HIR-mechanisms. On the other hand, the coefficients of teachability (TEACH) and codifiability (COD) and the control

Table 5 Correlation

	Intranet	E-mail	Internet	Training	Seminars and workshops	Councils and committees	Formal meetings	COD1	COD2	TEACH1	TEACH2	TEACH3	TEACH4	COMPLEX1	
Intranet	1.000														
E-mail	0.133	1.000													
Internet	0.064	0.312*	1.000												
Training	0.096	0.327*	-0.095	1.000											
Seminars and workshops	0.233	0.334*	-0.017	0.649**	1.000										
Councils and committees	0.306*	0.299*	-0.016	0.323*	0.534**	1.000									
Formal meetings	0.386**	0.491**	0.226	0.369**	0.439**	0.459**	1.000								
COD1	0.344*	0.467**	0.097	0.230	0.420**	0.079	0.344*	1.000							
COD2	0.226	0.318*	0.172	0.353*	0.455**	0.338**	0.283*	0.429**	1.000						
TEACH1	0.190	0.436**	0.224	-0.001	-0.096	0.040	0.062	0.368**	0.078	1.000					
TEACH2	-0.021	0.379**	0.109	0.392**	0.246	0.104	0.249	0.108	0.232	0.284*	1.000				
TEACH3	0.090	0.601**	0.187	0.179	0.141	0.132	0.347*	0.375**	0.196	0.289*	0.333*	1.000			
TEACH4	0.035	0.365**	0.269	-0.001	-0.144	-0.025	0.181	0.364**	-0.039	0.439**	0.192	0.484**	1.000		
COMPLEX1	0.032	0.026	-0.179	0.470**	0.527**	0.375**	0.146	-0.031	0.296*	-0.011	0.166	-0.056	-0.343*	1.000	
COMPLEX2	0.033	0.166	0.205	0.244	0.475**	0.266	0.194	0.011	0.345*	-0.137	0.207	-0.069	-0.327*	0.569**	1.000
COMPLEX3	0.149	-0.068	-0.090	0.297*	0.552**	0.144	0.107	0.119	0.195	-0.212	0.113	-0.165	-0.186	0.506**	0.506**
TRUST1	0.065	0.312*	0.160	0.409**	0.321*	0.002	0.331*	0.118	0.275	0.006	0.266	0.287*	0.129	0.193	0.193
TRUST2	0.171	0.355*	0.099	0.285*	0.294*	0.081	0.368**	0.188	0.316*	0.005	0.353*	0.406**	0.084	0.217	0.041
TRUST3	0.147	0.316*	0.193	0.330*	0.251	-0.059	0.131	0.130	0.370**	0.158	0.320*	0.369**	0.109	0.041	0.041
HIR	0.333*	0.458**	0.023	0.729**	0.848**	0.795**	0.708**	0.330*	0.466**	0.001	0.302*	0.249	-0.006	0.502**	0.502**
LIR	0.646**	0.630**	0.713**	0.125	0.248	0.277*	0.529**	0.425**	0.347*	0.398**	0.194	0.384**	0.308*	-0.071	-0.071
COD	0.370**	0.473**	0.245	0.344*	0.470**	0.250	0.405**	0.787**	0.895**	0.215	0.244	0.325*	0.169	0.184	0.184

Table 5 continued

	Intranet	E-mail	Internet	Training	Seminars and workshops	Councils and committees	Formal meetings	COD1	COD2	TEACH1	TEACH2	TEACH3	TEACH4	COMPLEX1	
TEACH	0.102	0.626**	0.283*	0.199	0.050	0.086	0.297*	0.447**	0.159	0.708**	0.638**	0.741**	0.757**	-0.094	
COMPLEX	0.081	-0.007	-0.036	0.407**	0.656**	0.337*	0.141	0.024	0.327*	-0.118	0.187	-0.168	-0.343*	0.854**	
TRUST	0.138	0.360*	0.147	0.375**	0.348*	0.028	0.323*	0.209	0.342*	0.064	0.332*	0.383**	0.112	0.168	
AGE	-0.188	-0.190	-0.118	-0.009	-0.003	-0.045	-0.158	-0.069	-0.234	-0.325*	-0.140	-0.074	-0.234	0.134	
MULTI	0.005	-0.230	-0.114	-0.036	0.084	0.273*	0.065	-0.025	-0.012	-0.157	-0.024	-0.068	-0.034	0.059	
			COMPLEX2	COMPLEX3	TRUST1	TRUST2	TRUST3	HIR	LIR	COD	TEACH	COMPLEX	TRUST	AGE	MULTI
Intranet															
E-mail															
Internet															
Training															
Seminars and workshops															
Councils and committees															
Formal meetings															
COD1															
COD2															
TEACH1															
TEACH2															
TEACH3															
TEACH4															
COMPLEX1															
COMPLEX2		1.000													
Complex3		0.429**	1.000												
TRUST1		0.285*	0.081		1.000										
TRUST2		0.291*	0.089		0.829**	1.000									

Table 5 continued

	COMPLEX2	COMPLEX3	TRUST1	TRUST2	TRUST3	HIR	LIR	COD	TEACH	COMPLEX	TRUST	AGE	MULTI
TRUST3	0.241	-0.026	0.792**	0.791**	1.000								
HIR	0.388**	0.367**	0.317*	0.312*	0.189	1.000							
LIR	0.197	0.009	0.244	0.287*	0.311*	0.374*	1.000						
COD	0.254	0.193	0.251	0.341*	0.348*	0.463**	0.529**	1.000					
TEACH	-0.122	-0.159	0.242	0.300*	0.337*	0.193	0.453**	0.330*	1.000				
COMPLEX	0.789**	0.803**	0.188	0.193	0.070	0.529**	0.024	0.240	-0.164	1.000			
TRUST	0.293*	0.056	0.935**	0.946**	0.914*	0.323*	0.296*	0.336*	0.313*	0.164	1.000		
AGE	0.094	0.092	0.071	0.142	-0.026	-0.065	-0.244	-0.223	-0.274	0.119	0.082	1.000	
MULTI	0.117	0.091	-0.409**	-0.405**	-0.404**	0.149	-0.148	-0.030	-0.053	0.115	-0.433**	0.518	1.000

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

Table 6 Regression results for HIR

HIR	Model 1	Model 2
Intercept	1.311 (0.949)	1.180 (1.540)
COD	0.197 (0.124)	0.186 (0.133)
TEACH	0.154 (0.138)	0.110 (0.151)
COMPLEX	0.463*** (0.119)	0.458*** (0.128)
TRUST		0.072 (0.222)
AGE		-0.006 (0.007)
MULTI		-0.070 (0.119)
	$F = 8.156$	$F = 4.236$
	$R^2 = 0.363$	$R^2 = 0.407$
	$N = 46$	$N = 43$

*** $p < 0.01$; ** $p < 0.05$;
 * $p < 0.1$; values in parentheses
 are standard errors

variables are not significant. The coefficient of AGE is negative but not significant. Age results in more standardization due to the knowledge conversion effect and hence in less use of HIR. In addition, the coefficient of MULTI is negative but not significant. Multi-unit franchising (MULTI) results in less HIR, due to the delegation of system knowledge transfer to the multi-unit franchisees. The coefficient of TRUST is positive but not significant.

(2) Hypotheses 2: LIR We estimate the following regression equation for LIR:

$$\text{LIR} = \alpha + \beta_1 \text{TEACH} + \beta_2 \text{COMPLEX} + \beta_3 \text{COD} + \beta_4 \text{TRUST} + \beta_5 \text{AGE} + \beta_6 \text{MULTI}$$

We expect that LIR varies positively with codifiability (COD) and teachability (TEACH) and negatively with complexity (COMPLEX). In addition, TRUST is positively correlated with the use of LIR. AGE leads to standardization of communication in the network and hence to the use of more LIR. Due to the delegation of knowledge transfer tasks to multi-unit franchisees, multi-unit franchising systems (MULTI) require less knowledge transfer mechanisms. Table 7 reports the results of the regression analysis for LIR. The coefficient of codifiability (COD) is positive and significant in both models. This is consistent with our hypothesis that an increase in codifiability of knowledge results in the use of more LIR. The coefficient of teachability (TEACH) is positive and significant which indicates that LIR supports the transfer of less tacit system knowledge. The coefficients of complexity (COMPLEX) and the control variables are not significant.

Table 7 Regression results for LIR

LIR	Model 1	Model 2
Intercept	0.625 (1.106)	1.640 (1.815)
COD	0.398*** (0.145)	0.352** (0.157)
TEACH	0.379** (0.161)	0.368** (0.178)
COMPLEX	-0.014 (0.138)	0.046 (0.150)
TRUST		-0.094 (0.262)
AGE		-0.006 (0.008)
MULTI		-0.177 (0.141)
	$F = 6.404$	$F = 3.276$
	$R^2 = 0.309$	$R^2 = 0.347$
	$N = 46$	$N = 43$

*** $p < 0.01$; ** $p < 0.05$;

* $p < 0.1$; values in parentheses are standard errors

6 Conclusions

In this paper we develop and test a knowledge-based view on the choice of knowledge transfer mechanisms in franchising networks. According to the knowledge-based view, the knowledge transfer from franchisor to franchisees is governed by more HIR if the system-specific knowledge is more tacit, and it is governed by more LIR if the system-knowledge is more explicit. Using complexity, teachability and codifiability as measures for tacitness of system-specific knowledge the data from the Austrian franchising sector provide some support of the hypotheses.

How does our approach extend the results in the literature? The major contribution of our study is to apply the knowledge-based approach for the explanation of knowledge transfer mechanisms in franchising networks. Our study utilizes primary data from the Austrian franchise sector that enables the estimation of factors that the theory considers important to affect the choice of knowledge transfer mechanisms. We use knowledge attributes, such as complexity, teachability and codifiability, to empirically evaluate the impact of tacitness of system-specific knowledge on the choice of knowledge transfer mechanism.

This study has important limitations: First, due to the small sample size the generalizability of the results is limited; further research analyzing data from other countries with a larger number of franchise systems would help ascertain generalizability of our research results. Second, the measurement of knowledge is not without limitations; it is a first step to measure tacitness of knowledge by different knowledge attributes. Third, we have captured trust as control variable at a rather general level.

Conceptually, trust could take at least two forms (Bohnet and Baytelman 2007; Lazzarini et al. 2006): Knowledge-based or belief-based trust related to the history of inter-organizational experience and general trust related to the motivational characteristics of the partners. However, we did not differentiate between these two forms. The influence of knowledge-based and general trust on the choice of knowledge transfer mechanisms is an important issue for future research.

Our findings also have practical relevance for the franchisors. Franchisors have to select knowledge transfer mechanisms according to the degree of tacitness of the knowledge source. Based on the findings from the sample of Austrian franchise systems, the franchisor will choose lower-IR-knowledge transfer mechanisms to facilitate the transfer of more explicit system-specific knowledge and higher-IR-knowledge transfer mechanisms to facilitate the transfer of more tacit system knowledge. Hence the franchisor has to match the knowledge transfer strategy to the information processing requirements of the different attributes of system-specific knowledge.

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Appendix

Measures of variables

Lower-IR-knowledge Transfer mechanisms (LIR)	To what extent does the franchisor use knowledge transfer mechanisms with a lower degree of IR: (Intranet, internet, email) (1, no extent;...7, to a very large extent)
Higher-IR-knowledge Transfer mechanisms (HIR)	To what extent does the franchisor use knowledge transfer mechanisms with a higher degree of IR: (Seminars, workshops, training, committee and council meetings, meetings between franchisor and franchisees) (1, no extent;...7, to a very large extent)
Complexity (COMPLEX) Coefficient alpha: 0.74	The franchisor has to evaluate complexity on a 7 point scale (1,strongly disagree; ...7, strongly agree): Complex 1: Franchisees must master many diverse activities and tasks, in order to be able to apply the system knowledge successfully. Complex 2: Activities and tasks for the application of system know-how are very complex. Complex 3: Activities and tasks for the application of system know-how are very heterogeneous.

Table 8 continued

Teachability (TEACH) Coefficient alpha: 0.67	The franchisor has to evaluate teachability on a 7 point scale (1, strongly disagree; ...7, strongly agree): Teach 1: Franchisees can easily learn the most important activities of the franchise system by talking to the skilled employees of the headquarters. Teach 2: Franchisees can easily learn the most important processes/ activities of the franchise system through the personal support of the skilled employees of the headquarters. Teach 3: The employees of the franchisee can master the new knowledge through training. Teach 4: Training of franchisees to apply new knowledge is a quick and easy job.
Codifiability (COD) Coefficient alpha: 0.57	The franchisor has to evaluate codifiability on a 7 point scale (1, strongly disagree; ...7, strongly agree): Cod 1: Large parts of the business processes between the headquarters and the outlets can be carried out by using information technology. Cod 2: Critical parts of the business processes in the franchise system can be extensively documented in written form
Trust (TRUST) Coefficient alpha: 0.92	The franchisor has to evaluate trust on a 7 point scale (1, strongly disagree; ...7, strongly agree): Trust 1: There is great trust between us and franchisees. Trust 2: There is an atmosphere of openness and sincerity. Trust 3: The mutual cooperation is on a partnership basis.
Years of existence of the franchise system (AGE)	Number of years since opening the first franchise outlet in Austria.
Multiunit (MULTI)	The ratio of franchised outlets in the franchise system to the number of franchisees.

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