

The cognitive processes preceding an organizational innovation: Implications for emerging economy contexts (Los procesos cognitivos que anteceden la innovación organizacional: implicaciones para contextos de economías emergentes)

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Abstract. In hyper competitive environments, knowledge has turned to be the most valuable resource. However, a competitive advantage is achieved through the firm's capability for assimilating and exploiting it with commercial purposes, as a product or process innovation. Therefore, the cognitive processes, defined as knowledge creation, transfer, and assimilation preceding an organizational innovation, are critical for a firm's survival in markets such as those of emerging economies. In addition, contextual factors such as the structure, the culture, strategic processes and information technologies have been identified in several studies as responsible for an effective knowledge transfer, while the effects of knowledge characteristics and the capabilities of senders and receivers have not been sufficiently integrated in literature. This study presents a literature review about the cognitive processes preceding an organizational innovation in order to map the different topics and research lines related to the phenomena. Then, the effects of contextual organizational factors, as found on different frameworks, are discussed. Finally, a proposed framework for application in emerging economies is introduced.

Palabras clave: cognición, contexto organizativo, innovación organizativa, transferencia de conocimiento

Resumen. En mercados altamente competitivos, el conocimiento se ha convertido en el recurso más valioso para las organizaciones. Sin embargo, el logro de una ventaja competitiva se determina a través de la capacidad de la organización para asimilar y explotar el conocimiento comercialmente, por medio de un producto o proceso innovador. Por tanto, los procesos cognitivos que anteceden la innovación organizacional, caracterizados por la creación, transferencia y asimilación del conocimiento, son críticos para el logro de la

supervivencia de la empresa en mercados emergentes. Además, factores contextuales como la estructura, la cultura, los procesos estratégicos y las tecnologías de información han sido vinculados en diversos estudios con transferencias efectivas de conocimiento, mientras que los efectos de las características del conocimiento y las capacidades de tanto emisores como receptores no han sido integradas satisfactoriamente en la literatura. El presente estudio muestra una revisión de la literatura sobre los procesos cognitivos que preceden la innovación organizacional con el fin de señalar diferentes temas y líneas de investigación relacionados con el fenómeno. Además, los efectos de los factores contextuales, identificados en diferentes modelos conceptuales, son objeto de discusión. Finalmente, se introduce un modelo conceptual para economías emergentes.

Introduction

The first decade of the 21st century has been characterized by a highly competitive environment, in which the achievement and maintenance of a market position is determined by a competitive advantage. According to Grant (1996), unstable market conditions caused by a hyper competition have shifted organizational perspectives towards the determination of key capabilities for the establishment of strategic objectives.

In emerging economies, defined by a rapid growth pace and policies that promote a liberalization of the economy, market openness has generated a competitive environment that forces the development of survival strategies among domestic firms (Wright et al., 2005). In that sense, according to Carrillo and Gaimon (2004), organizations must modify their key capabilities regarding resources, as a response to continuous threats from competitors and technological shifts.

Lam (2004) states that an organization's ability to innovate is vital for a successful use of resources and technologies. However, an organizational innovation, defined as the creation or adoption of a new idea or behavior to the organization, presents complex challenges regarding the diffusion and adoption processes. According to Crossan and Apaydin (2010), there is a gap between the adoption and actual implementation of an innovation, due to management issues regarding its exploitation towards commercialization.

In addition, Nahapiet and Goshal (1998) state that the organizational knowledge creation ability with superior competitive outputs at dynamic environments depends on individual's disseminative and combinative skills, compounding the knowledge transfer process within an organization.

Ives et al. (2003) state that an effective knowledge transfer process depends on organizational factors such as: the structure, the culture, strategic processes and information technologies. However, the particular context in which the process is held, along with its antecedents and consequences; plays a fundamental role in its success (van Wikj et al., 2008).

After identifying a lack of research concerning the integration between organizational contextual factors, knowledge characteristics and cognitive capabilities related to an organizational innovation process, this study aims to respond the following research questions: How do the success of an organizational innovation is influenced by cognitive processes? Are there significant differences in emerging economy contexts? This paper aims to study the cognitive processes preceding an organizational innovation. A literature review is presented in order to map the different topics and research lines related to the mentioned processes. Then, the effects of contextual organizational factors, as found on different studies, are discussed. Finally, a proposed framework for application in emerging economies is introduced.

Literature Review

Organizational innovation, using the definition by Crossan and Apaydin (2010) as the production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres, has been studied through three main strands. Apart from the structural research line; and the organizational change and adaptation strand; the cognitive processes have been based on organizational learning and knowledge creation theories. Thus, the capacity of organizations to create and exploit new knowledge necessary for innovative activities has been studied in a micro-level, focusing on how organizations develop new ideas for problem solving (Lam, 2004).

Knowledge

Knowledge is a complex concept based on successfully proven ideas. Although its meaning has been discussed regarding epistemological approaches of the “truth” as the essence of knowledge; this study will follow Argote et al. (2003) definition related to an individual’s justified belief of the

truth. Moreover, the terms “information” and “knowledge” have been used indistinctively in literature; the former refers to the flow of messages or meanings that could add, restructure or change knowledge.

According to Nahapiet and Goshal (1998), knowledge exists in a variety of forms, from concepts and task-related skills, to interactions between organizational members.

Knowledge characteristics affect the degree of absorption, accumulation and transmission within organizations. Tacit knowledge, based on skills and experience (Polanyi, 1967), is found on an individual’s mind. It represents a greater challenge for transfer purposes, usually via observation (Argote et al., 2003). Explicit knowledge, in contrast, consists of routines, procedures and directions in a codified format, for collective use (Nonaka, 1994). Thus, knowledge in a non-codified or clarified form poses a difficult task regarding the transfer process within an organization (Kogut and Zander, 1995).

Organizational Knowledge

According to Carrillo and Gaimon (2005), organizational knowledge is a distinctive resource which could lead to better responses to changes in the environment. This argument is based on the Knowledge Based View perspective derived from the Resource Based View (Wernerfelt, 1984; Barney, 1991), which states that a competitive advantage could be achieved through the efficient use of valuable, rare, inimitable and non-substitutable resources.

Organizational knowledge is a concept that has been studied through different perspectives in literature. Guzman and Wilson (2005) define it as a social construct, implying concepts, methods, routines, technologies and tools for performance improvement. It involves the context, for the required conditions of operation; and the individuals, for interpretation, organization, planning, development, and execution of the given knowledge.

According to Guzman and Wilson (2005), organizational knowledge can be: partly tacit, based on abilities and skills; partly codified into an explicit form, based on a systematic group of rules and procedures; and multi-actor, involving more than one individual for its transfer. In that sense, it is collective and related to a particular context.

Kogut and Zander (1992) divide organizational knowledge into know how and information, being the former element related with the skills and abilities required for an effective performance of a task (von Hippel, 1988); while the latter implying a meaning. Additionally, they state that know-how represents a challenge both in time and financial resources, regarding its transfer within the organization, due to coding requirements.

Organizational knowledge is dependent on a specific situation, including individuals' values and assumptions that shape behavioral decisions for the transfer process. However, it is derived from an emergent process, based on people's minds. Thus, organizational knowledge is a cognitive process that evolves within the members of a given organization. Its significance is rooted on organizational capabilities developed over time, and shaped by macro, micro and institutional forces (Guzman and Wilson, 2005).

Knowledge Creation and Knowledge Transfer

Concerning the literature on organizational knowledge, a stream of researchers focus on the micro-organizational, social and cognitive processes in which knowledge is created, transformed and transferred. . Authors such as Nonaka (1994) and Grant (1996) have considered the knowledge created and possessed by organizational members as an invaluable asset. Moreover, Kogut and Zander (1992) state that a firm could be understood as a social community specialized in the speed and efficiency of the creation and transfer of knowledge. However, the abilities and skills possessed by organizations for the creation and sharing of knowledge are derived from a series of factors related to its culture and basic principles. (Argote et al, 2003).

Regarding knowledge creation, Nonaka (1994) proposes a model based on four patterns of interaction between individuals: tacit-tacit; explicit-explicit; tacit-explicit; and explicit-explicit. Moreover, Nonaka states that the dimension of externalization, understood as the degree of interaction between individuals, determines knowledge transfer explicitly. In the opposite way, the dimension of internalization, defined as the assimilation of elements related with functional ideas, leads to the absorption of tacit knowledge. The spiral of knowledge is then compounded by the relation between both dimensions of knowledge creation.

Gradually, the concepts with a greater permeation within the organization compound an institutional data bank of valuable knowledge for any member of the firm. The permeability of knowledge, both tacit and explicit, is grounded in the interaction between organizational members. The role of individuals is related to the commitment at the process of creation, for the benefit of an entire firm. Moreover, interactive communities contribute in the amplification and development of useful concepts and ideas, by providing a mechanism for the creation and transfer of knowledge beyond organizational structural boundaries (Argote et al., 2003).

Concerning the transfer of knowledge, van Wikj et al. (2008) define it as the process through which organizational entities, such as individuals, teams, or units, exchange, receive and are influenced by the knowledge from a third party. Gilbert and Levine (1998) define it by five steps: the creation of an idea; the sharing of an idea; the evaluation; the dissemination; and the adoption.

The first two steps are subdued to an individual's capability and commitment at the organization. The creation of an idea consists of a cognitive process pertaining an individual's mind. Regarding the second step, knowledge sharing occurs if the following premises are followed: ideas exist in an interpretative format; and the individual must be motivated to share his ideas to other members of the organization (Gilbert and Levine, 1998). The first premise involves the transformation of ideas into coded formats. Explicit knowledge facilitates its dissemination, while tacit knowledge requires face to face contact, based on experience. Regarding the second premise, the nature of the relationship between the source and the receptor is a key element for the success of the process of knowledge transfer (Szulanski, 1996).

Gilbert and Levine (1998) define the last three steps of the process of knowledge transfer in a structured fashion. Concerning the evaluation of an idea, Gilbert and Levine state that historical analyses must be done, including the context in which the idea emerged. In addition, organizational members must have the appropriate skills and abilities for the evaluation of a given idea. Regarding the fourth step, Gilbert and Levine state that an idea must be coded in such a way that is useful for other members of the organization. Information and communication technologies are available for the pursuit of the mentioned step in the process of knowledge transfer. Finally, the

adoption of an idea is centered upon the degree of internalization within the organization. It includes, depending on the relevance of each idea, its incorporation in policies, procedures, workflows or any other means, for the benefit of all organizational members (Gilbert and Levine, 1998).

Knowledge transfer has been studied by a number of theoretical investigations, study cases, as well as both cross-sectional and longitudinal studies. Concerning the first group of empirical studies, Tallman et al. (2004) established propositions about the relationship of the transfer of knowledge in regional clusters, and competitiveness; while Reagans and McEvily (2003) examined the influence of network structure of R&D firms on knowledge transfer; and Darr and Kurtzberg (2000) used primary and secondary data from costs, volume, and sales for the study of knowledge transfer between pizza franchises. Regarding longitudinal studies, Dyck et al. (2005) explored knowledge transfer within an SME during periods of redesign.

Concerning the exchange and combination of knowledge as a mere communicative process, most of the research in knowledge management has covered the use of technologies for the acquisition and storage of knowledge generated by organizational members (Grey and Meister, 2004). Other research lines have included the cost of knowledge contribution and adoption (Menon and Pfeffer, 2003); as well as the individual's motivation towards knowledge externalization (Davenport and Prusak, 1998).

Other studies about knowledge transfer between individuals within the same organization have covered issues such as trust upon leadership, the effect of time regarding team members' dynamics (Gardner, 2009), as well as cultural factors that inhibit the mentioned process (Kumar and Ganesh, 2009).

A fundamental element in the study of knowledge transfer is related to the mechanism of transmission. Several authors, such as Hansen et al., 1999; Bordia et al., 2006; Boh, 2007; Scheepers et al., 2004; Child and Shumate, 2007; Haesli and Boxall, 2005; have developed conceptual frameworks for the study of those mechanisms. According to Kumar and Ganesh (2009), mechanisms for the transfer of knowledge such as the movement of the individual, the tools, the activities, the social networks and the documents have been examined in several empirical studies.

However, Spender (1996) states that the creation and transfer of tacit knowledge has remained as a "black box", given the uncertainty of its transmission and utilization, as well as its effects on innovation. In a different

perspective, McEvily and Chakravarthy (2002) mention that the advantages on organizational performance based on tacit knowledge become hard- to-replicate by competitors. As for empirical studies related with the mentioned process, Subramaniam and Venkatraman (2001) examine the transfer of tacit knowledge between multinational companies regarding product development. Similarly, Haas and Hansen (2007) consider both the transfer of explicit and tacit knowledge in their research study.

Since organizational knowledge transfer requires the integration of differentiated knowledge, changes in the knowledge bases or performance of recipients are expected (van Wijk et al., 2008). Concerning the relation between knowledge transfer and organizational performance, Dyer and Hatch (2006) consider the effects of knowledge acquired from social networks, on organizational performance. They conclude that organizations show different levels of performance according to the characteristics of the social networks they participate on. In a different study, Collins and Smith (2006) relate the likelihood of knowledge transfer with factors associated with human resources practices within the organization, and quantify its impact on a technological measurement of performance, based on innovation. Finally, Rhodes et al. (2008) analyze a given set of factors related to knowledge transfer in Taiwanese high-tech firms, and the impact of each factor on innovation and organizational performance. They base their study on a framework containing factors of organizational context as inputs of knowledge transfer, which then is related to innovative capabilities and both economic and non-economic indicators of performance.

According to van Wijk et al. (2008), emerging lines of research have been studying the attributes of knowledge as an important antecedent of the transfer process. Knowledge ambiguity, referring to the uncertainty of the underlying components and sources of knowledge, has been used as a predictor of organizational knowledge transfer (Szulanski et al., 2004). Due to tacitness and specificity, the ambiguity of the knowledge that is intended to be transferred serves as a protective factor against imitation. However, it hinders the process of knowledge transfer within and between organizations (van Wijk et al., 2008).

A second stream has studied organizational attributes and their effects on organizational knowledge transfer. According to van Wijk et al. (2008), studies considering size have resulted in positive effects (Dhanaraj et al.,

2004; Gupta and Govindarajan, 2000), while other studies have resulted non-significant. Other studies have considered age as a control variable, since aging organizations have been argued to develop inertia and a limited ability for learning and adaptation in changing environments (Cyert and March, 1963). Therefore, cognitive and relational patterns of young organizations are supposed to behave in the opposite way (Van Wikj et al. , 2008). However, empirical findings have suggested inconclusive results regarding organizational knowledge transfer (Grey and Meister, 2004).

Finally, decentralization has been a control variable in organizational knowledge transfer studies. According to Cardinal (2001), the dispersion of the source of authority and decision-making through the organization broadens communication channels, ultimately improving the quality and quantity of the information shared (Van Wikj et al. , 2008). Moreover, Gupta and Govindarajan (2000) state that decentralization enhances the perception of freedom among individuals, leading to an increased motivation towards knowledge sharing.

During a knowledge transfer process, organizational factors have a varying influence on the knowledge transfer ability of the firm, which could be measured by innovative capabilities and organizational performance. Rhodes, Hung, Lok, Lien, and Wu (2008) presented a framework that includes four factors related to the organizational context with a theoretical influence on the knowledge transfer ability of the firm. Information Technologies; a learning strategy; a trust culture; and the design of the organizational structure have been identified as preceding factors for knowledge transfer.

Knowledge Acquisition, Assimilation and Exploitation

In highly competitive and changing environments, core competences based on a unique combination of resources and organizational capabilities must be highly adaptative. (Teece et al, 1997). Thus, a group of researchers is focused at the organizational level processes, components and developed capabilities that support knowledge acquisition, assimilation and exploitation, for the achievement of a firm's competitive advantage.

Cohen and Levinthal (1990) have studied the firm's ability to recognize and assimilate valuable external knowledge for commercial purposes, labeled as absorptive capacity. Zahra and George (2002) identified the four

dimensions that compose an absorptive capability: acquisition, defined as the firm's capacity to identify external knowledge; assimilation, referring to the firm's capacity of processing, examining, interpreting, and understanding the knowledge acquired; transformation, referring to the firm's capacity of combining the new knowledge within the organization; and exploitation, consisting of the capacity to refine and incorporate the knowledge into the firm's current operations.

According to Cohen and Levinthal (1990), the capacity of firms to evaluate and use external knowledge, increases in relation to knowledge accumulation and consequent expertise. Tushman (1990) concluded that prior knowledge is fundamental for the nourishment of an absorptive capacity, when discussing the ability of organizations to generate innovation and technological in turbulent environments. However, the routines and methodologies institutionalized within a firm (Nelson and Winter, 1982), could diminish its absorptiveness, due to path dependency issues. Thus, the role of knowledge acquirers and transmitters is fundamental for its successful exploitation within firms.

Knowledge Dissemination

The disseminative capacity related to knowledge transfer, whether from internal or external sources, has been used in several conceptual studies (Gupta and Govindarajan, 2000; Szulanski, 1996). It refers to the ability of people to efficiently, effectively, and convincingly articulate and communicate knowledge in a way that others could understand, learn, and put into practice (Mu et al., 2010). There is a prevailing assumption that knowledge can be assimilated by the receiving unit without a considerable effort of the sending counterpart, if the former possess a sufficient absorptive capacity. However, Mu et al., (2010) state that an efficient knowledge transfer requires of a strong disseminative capacity of the sending unit, in accordance with the idea that transferring knowledge demands teaching (Winter, 1987).

Due to the scope and the objectives of the study, learning processes are not covered hereby.

Findings

The literature about the cognitive processes preceding an organizational innovation, knowledge creation and exploitation, focuses on an input-output relation between a creative unit and a receiving entity. According to Guzman and Wilson (2005), it is divided into individual and organizational approaches. Thus, an integrative approach for analyzing the creation and exploitation of knowledge preceding an innovation, both through individual and organizational levels, is needed.

Although several control variables, such as: size, age, or decentralization, have been explored, soft issues related to contextual factors and socio-behavioral patterns have not been sufficiently studied. This gap is consistent with more general findings about the application of strategy theories and methodologies from developed economies in emerging markets. According to Wright et al. (2005), theoretical approaches need to be suited to the unique social, political and economic contexts of emerging economies. Important contextual factors may also contribute to explanations of strategic decisions of domestic firms. These factors include the development of market institutions, high levels of government involvement, industry structures, ownership patterns, and enforcement of business laws. Moreover, there is a changing nature on institutional contexts and learning processes in emerging economies (Wright et al, 2005).

As a concluding remark, several studies have aimed to focus on the outcome of the cognitive processes of organizational innovation, through a firm's performance. However, there is still a non-conclusive research line about the factors involved in the enhancement of an organizational innovation. In Rhodes et al. (2008) Integrative Framework, the process of knowledge transfer is measured through two variables: codification and personalization, referring to the sending unit and the recipient entity respectively. However, such operation of the construct appears limited in relation to the complexity of the information to be transferred and the amount of effort required both by the senders and the receivers, aiming for an effective process of knowledge transfer. Therefore, based on the literature review, a complementary set of specific variables is proposed in order to enrich the framework.

Proposed Framework

Regarding the knowledge generation or external sourcing stage, the disseminative capacity is incorporated, due to the implications of codification and interpretation of new information into an understandable format for the organization. Similarly, the absorptive capacity is incorporated in the knowledge assimilation or adoption stage, due to the relevance for an ultimate exploitation of the new knowledge via innovation.

Social Contextual factors: Although some cultural aspects are covered by the organizational context factors of Rhodes et al. (2008) Integrative Framework; a more specific analysis of the context for the transfer of knowledge is proposed. Yeoh (2009) presents a framework of knowledge sourcing and its effect on performance, including a classified nomenclature about the cultural context where knowledge creation and transfer occur.

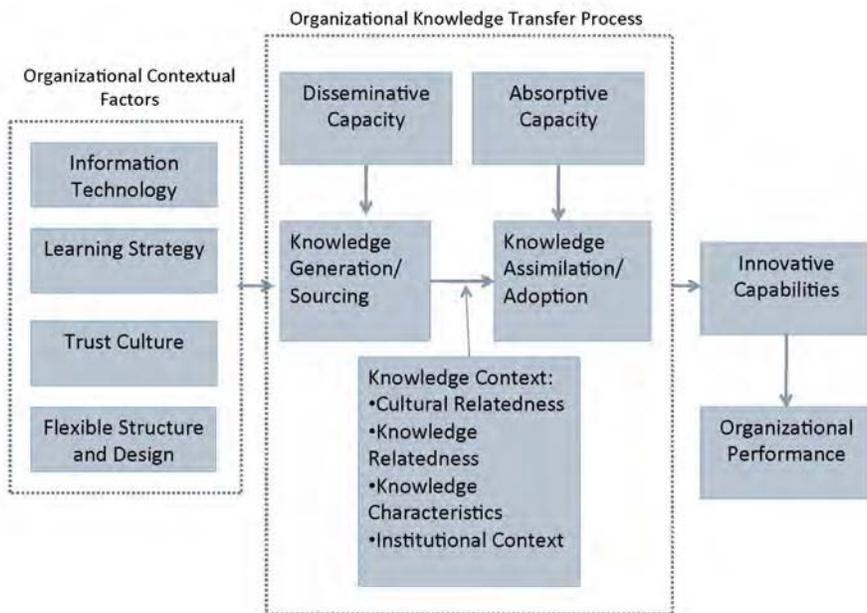
Concerning the context where knowledge is being introduced, Yeoh (2009) incorporates the following variables: *Cultural Relatedness*, as the cultural commonalities with the source of knowledge; *Knowledge Relatedness*, as the technology and manufacturing relatedness between the source and the recipient of knowledge; *Knowledge Characteristics*, as the complexity and articulation of the knowledge for transfer; and *Institutional Context*, as the normative structure and resources required.

Concerning an internal source of knowledge perspective, Yeoh (2009) includes the *Social Context*, as the nature of the interpersonal linkages and network relations that enhance knowledge sourcing. However, this is consistent with Rhodes et al. (2008) framework as for the Trust Culture factor.

Thus, the following framework for organizational innovation through cognitive processes (Figure 1) based on Rhodes et al. (2008), is presented. Organizational context factors precede the organizational knowledge transfer process, composed of the knowledge generation or sourcing stage, and the knowledge assimilation or adoption stage. The former is influenced by the disseminative capacity of the individual or group performing on the mentioned stage. The latter is influenced by the absorptive capacity of the individual or group performing on the counterpart. In addition, contextual aspects of the knowledge being transferred mediate the process. Then, the outcome of the transfer serves as an input for the construct of innovativeness, through the

measurement of the organizational innovative capacity. Finally, the organizational performance is influenced by the mentioned innovativeness.

Figure 1. *Framework for Organizational Innovation through Cognitive Processes, adapted from Rhodes et al. (2008)*



Regarding the application of the proposed framework, the organizational context factors could be qualitatively measured through Rhodes et al. (2008) validated surveys, using a Likert scale. Similarly, the innovative capabilities and organizational performance variables have their respective surveys. However, the organizational knowledge transfer process of the framework lacks an instrument for measurement.

Discussion

Knowledge has become the most valuable resource at highly competitive and changing environments. However, its value is proportional to the commercial use that leads to a competitive advantage in the market. This means that the organizational performance of a firm is related to the enhancement of innovative capabilities. Thus, the new knowledge is efficiently disseminated, assimilated and exploited through the development of new products and processes.

The cognitive processes preceding an organizational innovation are fundamental for its success. Although several studies have analyzed organizational knowledge transfer with a variety of frameworks including organizational factors; cultural and social factors that could influence knowledge dissemination and absorption have not been widely incorporated.

As discussed before, the context where the new knowledge is intended to be transferred is determinant for a successful adoption and consequent exploitation, particularly in emerging economies. Dynamic environments with uncertainty about economic and political conditions dictate the need for more efficient frameworks for organizational innovation, towards the achievement of a competitive position in the market.

Therefore, this paper contributes to the body of knowledge with a proposed framework of organizational knowledge transfer and its relation with the enhancement of innovative capabilities, and ultimately, firm performance. Its differentiation is rooted on the incorporation of variables such as knowledge characteristics and its relatedness with the culture of a specific firm; highlighting the relevance of the context while performing knowledge transfer processes for innovative purposes.

The application of the proposed framework remains latent for future research, due to the need to develop measurement instruments for the organizational knowledge transfer process. In addition, the need for an integrative approach regarding organizational knowledge transfer, as one of the findings from the literature review, remains unstudied. A framework combining both the individual and the organization as entities with a common set of factors and contextual characteristics could be explored. Finally, learning capabilities could be analyzed with respect to the cognitive process preceding an organizational innovation.

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