

# **Crowding at the frontier: knowledge brokers, gatekeepers, boundary spanners and marginal-intersecting individuals**

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## **Abstract**

Organizations cannot survive without relations to their environment, which provides resources and markets for their products and services. Our research focuses on the role of individuals in such exchanges, and in particular, on three types of brokers who have an information and knowledge dissemination role: knowledge brokers, gatekeepers and boundary spanners. Although research on these individuals is extremely rich, we found that the concepts still need a clarification.

In order to achieve this goal, we proceed to an analysis of the literature which leads us to a proposition to delineate the roles of boundary spanners, gatekeepers, and knowledge brokers, individuals who have an important function at the frontier of organizations. We propose to consider these roles in a dynamic perspective. The importance of the different roles of boundary spanners, gatekeepers and knowledge brokers can change over time, depending on personal characteristics and inclination, organizational and local contexts, and power games.

**Keywords:** knowledge broker, boundary spanner, gatekeeper, marginal-intersecting, organizational learning, frontier

## **Introduction**

Organizations cannot survive without relations to their environment, which provides resources and markets for their products and services (Crozier & Friedberg, 1977). Interacting with their environment permits firms to capture knowledge, learn and innovate (Cohen & Levinthal, 1990). It allows creating or maintaining a competitive advantage.

Individuals play a major role in the transfer of knowledge, where knowledge is seen as a collective, embodied social construction (Tsoukas, 1996, 2001). In particular, knowledge brokers, gatekeepers and boundary spanners are important interfaces between organizations and their environment. Although research on these individuals is extremely rich and ancient, at least for the two latter concepts, we found that these notions still need a clarification.

Research on brokerage can be dated back to the beginning of the 20th century, with the work of Simmel (1922). Two important types of brokers are gatekeepers and representatives, who both have boundary spanning roles (Gould & Fernandez, 1989). Another important boundary spanning role is played by knowledge brokers.

Boundary spanners link the organization to its environment (Cross & Prusak, 2002; Leifer & Delbecq, 1978). They play an important role in knowledge transfer and strategic decision making, thanks to their access to markets and resources, and to their ability to exchange information (Adams, 1976; Jemison, 1984; Katz & Kahn, 1966). Boundary spanning behaviors have been studied as far as the early 1920s (Abrahamson & Fisher, 2007; Friedman & Podolny, 1992). In management, most early research on boundary spanners focused on their role in innovation, in Research and Development contexts (Katz & Tushman, 1983; Tushman, 1977; Tushman & Scanlan, 1981a, 1981b). Since then, the phrase has been used in a variety of contexts and with diverse meanings (Kostova & Roth, 2003; Kusari, Cohen, Singh, & Marinova, 2005; Levina & Vaast, 2005).

Several early (and less early) works on boundary spanning individuals in management use the concepts of gatekeeper and boundary spanner in an undifferentiated way (Cohen & Levinthal, 1990; Nochur & Allen, 1992; Tushman, 1977). An analysis of the origins of the gatekeeper concept allows defining the central role of gatekeepers as information controllers and decision-makers (Lewin, 1947). From there, the roles of gatekeepers have been defined as either environment monitoring and information dissemination (Katz & Tushman, 1980), or as regulators of information (Awazu, 2004; Barzilai-Nahon, 2008). These roles have been

studied in research on innovation at the level of organizations and at the level of geographical clusters (Morrison, 2008).

Research on knowledge brokers is more recent and less developed. Knowledge brokers are individuals participating to multiple groups and facilitating the transfer of information among them (Brown & Duguid, 1998; Pawlowski & Robey, 2004) or "people moving between the two different worlds of knowledge producers and knowledge users" (Meyer, 2010a). Contrary to gatekeepers, they are usually considered as intermediaries who don't belong to the groups they span.

Whereas some researchers continue to use both terms of gatekeeper and boundary spanner - and sometimes knowledge broker - as synonyms or interlinked concepts (Abittan & Assens, 2011; Ramirez & Dickenson, 2010), others insist on the differences between boundary spanning roles (Awazu, 2004; Katz & Tushman, 1980; Von Hippel, 1976).

Our research contributes to clarifying the three concepts and their use, underlining overlaps as well as pointing out differences. We identify that the dimension of power relations still needs to be mobilized more systematically in future research to understand the performance of boundary spanners, gatekeepers and knowledge brokers in transferring and diffusing knowledge. The dynamic dimension of these actors also needs to be further explored in the future, to understand why individuals take on such roles and to comprehend their evolution.

Our article has six parts. The first part is dedicated to the concept of frontier in the context of organizational learning. We introduce the role played by different types of brokers in overcoming them. The second part outlines the methodology we used in our review of the literature on the concepts of boundary spanner, gatekeeper and knowledge broker. Our third part focuses on the concept of boundary spanner. We articulate the different definitions of the concept and outline the key dimensions and levers of this role. The fourth part is dedicated to the notion of gatekeeper. We point out important conclusions and issues raised by the concept. The fifth part is dedicated to the analysis of knowledge brokers. Our analysis provides the basis for a comparison of the notions of gatekeeper, boundary spanner and knowledge broker which leads us to proposing future venues for research.

## **1. Knowledge transfer and organizational frontiers**

### **1.1 Frontiers and knowledge**

Organizations can be defined as "distributed systems of knowledge" (Tsoukas, 1996) where individuals play a central role. This definition raises the essential question of how to access, develop and share this knowledge, overcoming group and organizational frontiers as needed.

Knowledge can be perceived either as a static object, or as dynamic and enacted (Fillol, 2006). Tsoukas (1996) pointed out two main research approaches regarding knowledge. The first one, based on a scientific rationalist view, proposes to "classify the different types of organizational knowledge and to draw out each type's implications" (p.13), whereas the second approach underlines the emergent and collective nature of knowledge. Interactions between individuals play a central role in learning (Ingham, 1994; Wenger, 1998). In this vision, the integration, coordination and awareness of the knowledge embodied and possessed by individuals within the organization is important (Jacquier-Roux & Paraponaris, 2012). Knowledge is both tacit and explicit (Tsoukas, 2003), which can make its transfer and diffusion difficult.

Knowledge transfer can be seen as a process of translation, which implies the transformation of knowledge by actors (Perrin, 2013). Van Krogh (2003) points out that there are two different ways to address the knowledge sharing issue: i) through an agency perspective that focuses on the type of organization and structure managers can put in place to enhance knowledge sharing, and ii) through a "communal resource" perspective, where individuals belong to communities and can thus become motivated to cooperate and share knowledge. A key issue remains overcoming the frontiers of the groups to which individuals belong. The social identity theory (Tajfel & Turner, 1986), emphasizes differences between the "in-group", to which an individual belongs, and the "out-group". In this approach, social categorization plays an important role in delineating organizational frontiers, whether within a firm or between the firm and its environment. This approach seems to propose only a binary choice to individuals, whereas actors can strategize their belongings to different groups (Crozier & Friedberg, 1977; Lazega, 2011).

## 1.2 The concept of broker

A broker is "an actor who mediates the flow of resources or information between two other unconnected actors" (Shi, Markoczy, & Dess, 2009, p. 1455) or "one that profits by intermediating between two or more parties" (Ryall & Sorenson, 2007, p.567).

Brokerage roles have been under study for decades. The role of brokers has been outlined in foundational work by Simmel in the early 1920s and Merton in the late 1960s. As early as the 1980s, research on social networks studied this role (Gould & Fernandez, 1989; Gray, Susman, & Ren, 2005).

The role of brokers is multiple, from intermediation to communication and information transfer. Brokers play an interface role which can allow them to have power over the parties they intermediate, and thus capture value (Ryall & Sorenson, 2007). Fernandez and Gould (Fernandez & Gould, 1994; Gould & Fernandez, 1989) differentiate 5 types of brokerage positions. "Liaisons" are external brokers connecting individuals from different groups. "Cosmopolitan" brokers link individuals belonging to the same group, but do not belong to their group. When all individuals belong to the same group, a broker is called a "coordinator". "Representatives" transfer information from inside their group to outside and can negotiate on behalf of their group. "Gatekeepers" transfer outside information inside their group. As stated by Fernandez and Gould (1994) : "The gatekeeper and representative types of broker, because they perform..."information processing" and "external representation" functions, have clear relevance for research on "boundary-spanning" roles" (p.1458). Another type of broker has been under study since the 1990s, but with few research: knowledge brokers, who are intermediaries transferring knowledge between groups to which they don't belong.

## **2. Methodology**

In this research, our purpose is to develop the understanding of individuals who bring and diffuse knowledge, information or intelligence inside organizations. These actors contribute to innovation and strategic thinking. These individuals are boundary spanners, gatekeepers and knowledge brokers. In particular, our objective is to define these concepts and understand their characteristics and levers of performance. We also aim at delineating the differences and similarities between these notions, identifying gaps in research along the way.

For our purpose, we chose to focus on research in management, even though the concepts under study are used in other scientific fields. We built a review of the literature, starting with an examination of major research databases such as ABI-Inform, Emerald Journals, Global Source, Google Scholar, J-store and Cairn (for research in French). We systematically analyzed lists of articles provided by these databases (using "gatekeepers", "boundary

spanners" and "knowledge brokers" as keywords). We evaluated the articles based on their relevance to our purpose.

As in any review of the literature, we had to make choices and select articles. We focused on several dimensions: 1. The historical interest of an article or reference, to explain the construction and evolution of the concepts. 2. The number of citations a particular article or reference received. 3. The ability of a particular article or reference to bring a new perspective on the understanding of the concepts (vs. articles only mentioning the concepts or using them in an anecdotal way).

This approach resulted in the identification of 103 references (articles, book sections, books) relevant to our study. We analyzed each reference, identifying their theoretical backgrounds and the themes addressed.

### **3. The boundary spanner: a generic concept ?**

#### **3.1 Origins and definitions of the concept**

Cross and Prusak (2007) describe boundary spanners as "ambassadors, people who serve as the group's eyes and ears in the wider world" (p.9). Leifer (1978) defines boundary spanners as "persons who operate at the periphery or boundary of an organization, performing organizational relevant tasks, relating the organization with elements outside it" (p.41). Some researchers insist on the interpersonal dimension of the role, defining boundary spanners as individuals responsible for contacting persons outside of their own group (Adams, 1976; Friedman and Podolny, 1992). Levina and Vaast (2005) differentiate nominated boundary spanners, whose boundary spanning role has been assigned by hierarchy, from boundary spanners in-practice, who actually perform a boundary spanning activity.

Boundary spanners contribute to strategic decision making (Leifer & Delbecq, 1978; Thompson, 1967) and innovation (Hsu, Wang, & Tzeng, 2007; Tushman, 1977). The social capital developed privately by a boundary spanner thanks to personal interactions can become public through the sharing of information (Kostova & Roth, 2003), which is an asset for the organization.

Friedman and Podolny (1992) date back the concept of "boundary spanning" to the early 1920s. In management, early work referring to boundary spanning behavior include the works of March and Simon (1958), Brown (1966) and Katz and Kahn (1966). The phrase "boundary

spanner" was introduced by Tushman in his 1977 article on special boundary roles in Research & Development departments (Tushman, 1977). The "boundary spanning" terminology appears to be a generic notion which is used to describe many different roles. Leifer and Delbecq (1978) underline the variety of terminologies applying to boundary spanning activity. They list 12 names given to boundary spanning individuals in the literature, including *linking pin*, *gatekeeper*, *liaison role* and *marginal man*. Closer to us, we can still recognize that the phrase "boundary spanner" can be used with a variety of meanings. Early work on boundary spanners focused on their role in innovation, in the context of Research and Development departments (Katz & Tushman, 1983; Tushman, 1977). In a multinational corporation setting, Kostova and Roth (2003) define for their research purpose a boundary spanner as "an individual employed at a subunit who currently has, or has previously had, direct contacts with a headquarters representative" (p.304). In another context, Kusari and co-writers (2005) describe boundary spanners as individuals at the "organizational interface", in relation with both customers and suppliers, and focused their study on salespersons.

### 3.2 The role of boundary spanners

Consistent with this multiplicity of definitions, boundary spanners can play many different roles in organizations. Katz and Kahn (1966) show that these individuals play an important role at the frontier of the organization, accessing to resources and commercializing outputs, relating the organization to its environment, and contributing to the adaptation of the organization. Jemison (1984) describes three main roles played by boundary spanners: i) information acquisition and control, ii) definition of markets and relationships with clients, and iii) relationships with suppliers. In alliances, boundary spanners play an important role, processing the information from the partner organization and representing the interests of their group (Aldrich & Herker, 1977).

Within organizational frontiers, Barner-Rasmussen and co-writers (2010) take a closer look at the activities of boundary spanners in multinational companies, which consist in: i) engaging in transactions and knowledge exchanges, ii) enabling other actors to link up, iii) facilitating transactions by assisting other actors, iv) intervening to create positive outcomes. The exercise of a linking function or a facilitating/intervening one is rarer among boundary spanners compared to information acquisition and control (Barner-Rasmussen et al., 2010). Boundary spanners can also play the role of "advocate of change" (Leifer & Delbecq, 1978,

p.41). Adams (1976) shows that they facilitate intergroup relations and allow the solving of conflicts.

Many research on boundary spanners focus on the exchange of information between a unit and its environment. Boundary spanning activity is needed when decisions have to be made and information available is not sufficient (Leifer & Delbecq, 1978). There are various sources of boundary spanning activity: i) a gap between the organization's goals and performance, ii) an inability to make a decision, iii) perceived environment uncertainty, iv) new technology, and v) multiple goals structure (Leifer & Delbecq, 1978). One of the key tasks of boundary spanners is "to reduce the stimuli emerging from technological, economic and cultural conditions – the macro-environment – to information relevant for the organization's goal attainment" (Leifer & Delbecq, 1978, p.44). Boundary spanners are crucial conduits of information, especially in situations where having access to different expertise is important, such as product innovation (Cross & Prusak 2002). They play a central role in knowledge exchange between the organization and its environment (Barner-Rasmussen et al., 2010; Brown, 1966). Boundary spanners reduce uncertainty thanks to their various activities (Jemison, 1984; Leifer & Delbecq, 1978).

### 3.3 The performance of boundary spanners

While part of the literature focuses on the different components or functions of the boundary spanner's role, other researchers studied the levers which impact the performance of boundary spanners, at the individual, organizational and macro-levels. Boundary spanners play an important role in knowledge transfer. Insuring that individuals in this position have the ability and competence to do it, and that the knowledge gathered is shared in the larger organization becomes critical.

#### 3.3.1 Levers at the individual level

Researchers agree that boundary spanners have specific and rare competencies. In their analysis of Corporate Social Responsibility managers in France, Chiapello and Gitiaux (2009) point out that only a small proportion of these managers are boundary spanners, relying on outside expertise and knowledge to perform their jobs, and can act as change managers. Boundary spanning is a key element of good managerial and leadership behavior (Likert, 1967; Mintzberg, 1973). It takes several competencies which are hard to develop to become an efficient boundary spanner, in particular, breadth of intellectual expertise, social contacts



and personality traits enabling the individual to be accepted by different groups (Cross & Prusak, 2002) and "influence collectively shared perceptions" (Kostova & Roth, 2003, p.314).

Individuals who are perceived to have the intellectual ability to mobilize resources in different units and have a high status are more likely to become boundary spanners (Tushman & Scanlan, 1981b; Hsu & al., 2007). To become an effective boundary spanner, an individual has to grow to be a legitimate participant and negotiator in several groups, and to develop an inclination to create and maintain relations outside her group (Levina & Vaast, 2005). In new projects, boundary spanning competence can be slow to emerge and nominated boundary spanners can even fail to attain their goal (Levina & Vaast, 2005; Nochur & Allen, 1992). Recent research focuses on the social capital dimension of boundary spanning (Barner-Rasmussen & al.; Levina & Vaast, 2005). The social capital of a boundary spanner depends on two factors : the scope and efficiency of interactions (Kostova & Roth, 2003). Kostova and Roth (2003) note that interactions across boundaries "should be meaningful, productive and directed toward mutually-beneficial work-related goals" (p.313) in order to reap the benefits of social capital. In multinational settings, the most efficient boundary spanners cumulate different types of social capital : structural, relational and cognitive (which includes language skills and cultural skills). Only boundary spanners benefiting from the full range of types of capital – "transcenders" – are able to "play a central role in inter-unit relationships and bridge group boundaries to the extent that they are often accepted as in-group members also in other groups than their own" (p.6). Another type of boundary spanner – "the ambassador" – who has 3 types of social capital, can play an important role in inter-unit relationship thanks to her expertise (Barner-Rasmussen & al., 2010).

Boundary spanners are prone to high levels of stress (Goolsby, 1992). Perception of justice and role stress have an influence on the willingness of boundary spanners to share information (Wachner & Arthurs, 2007). Researchers also underline the fact that, as all human beings, boundary spanners have limited information processing capabilities and have to select information (Leifer & Delbecq, 1978). Boundary spanners' personalities and wants together with their past experiences influence the way they select information (Leifer & Delbecq, 1978).

### 3.3.2 Levers at the organizational and macro levels

The structure of the organization influences boundary-spanning activity, an organic structure being more favorable to the development of this activity (Leifer & Huber, 1977). Leifer and Delbecq (1978) state that "a structure that cannot process much information may not allow transmitted information to be large...not allowing much expenditure of time and money for boundary spanning"(Leifer & Delbecq, 1978, p.48). There can be multiple boundary spanners in R&D groups (Cohen & Levinthal, 1990; Tushman, 1977), depending on the context of the organization and on the gap between the organization's knowledge and its environment.

Monitoring and incentives have an impact on boundary spanners' performance, as well as the situation of the company (good performance or crisis) (Wachner & Arthurs, 2007). Leifer and Delbecq (1978) demonstrate that activities of boundary spanners are influenced by perceived environmental uncertainty and the nature of the need for information (anticipated or not, regular or not). Among other factors, the behavior of boundary spanners is influenced by i) expectations of hierarchy, ii) the context of utilization of the information (Leifer & Delbecq, 1978).

Organizations have sometimes difficulties to accept the boundary spanning activities of individuals. Managers might find the boundary spanning activities unfocused or out of control (Davenport & Prusak, 1998). Also, there are potential negative effects of boundary spanning with other organizations (Ramarajan, Bezrukova, Jehn, & Euwema, 2011).

The following table synthesizes the main levers influencing the performance of boundary spanners.

*Table 1: Levers influencing the performance of boundary spanners*

Levels of analysis	Dimensions	Themes	References
Individual	Individual competencies / personality attributes	Leadership Communication skills Resource mobilization Legitimacy Intellectual expertise Past experience	Cross and Prusak (2002), Kostova and Roth (2003), Likert (1967), Leifer and Delbecq (1978), Mintzberg (1973), Tushman and Scanlan (1981), Hsu & al. (2007)
	Social capital	Status Social contacts Scope and efficiency of interactions Types of social capital (structural, relational, cognitive)	Barner-Rasmussne & al. (2010), Cross and Prusak (2002), Kostova and Roth (2003), Levina and Vaast (2005), Tushman and Scanlan (1981), Hsu & al. (2007)
	Personal inclination	Desires Needs	Leifer and Delbecq (1978)
	Level of stress		Goolsby (1992), Wachner and Arthurs (2007)
Organization	Structure	Organic structure Information processing capability Number of boundary spanners	Cohen and Levinthal (1990), Leifer and Delbecq (1978), Leifer and Huber (1977), Tushman (1977)
	Control and incentives	Expectations of hierarchy	Davenport and Prusak (1998), Leifer and Delbecq (1978), Wachner and Arthurs (2007)
	Situation of the organization (performance)		Wachner and Arthurs (2007)
	Context of utilization of information		Leifer and Delbecq (1978)

Boundary spanners are key individuals at the frontier of organizations, whose main tasks are to link groups, process and exchange information and act on behalf of their group as needed. The notion of "gatekeeper" is linked to this concept. This role is geared towards transferring knowledge inside the organization. In the following part, we propose to focus on gatekeepers, defining more precisely their attributes and specific contributions.

#### **4. Gatekeepers: only monitoring the frontier ?**

##### **4.1 Origins and definitions of the concept**

In the management field, gatekeepers are defined as "individuals in the communication network who are capable of understanding and translating contrasting coding schemes" (Katz & Tushman, 1980, p.1072). Macdonald and Williams (1993) note that the gatekeeper is "something of a scavenger of external information" (p.417). Gatekeepers are points of contact

for individuals outside of the organization, they link the organization with its environment, and internally, play liaison and coordination roles (Paul & Whittam, 2010). The gatekeeper concept can be used at the individual level, but also at the firm level, as shown by the literature on gatekeepers in industrial districts (see for example Morrison, 2008).

The "gatekeeping" notion has its roots in psychology, sociology, social psychology, political science and anthropology (Shoemaker & Vos, 2009). Barzilai-Nahon (2008) states that the gatekeeper concept has been developed mainly in four fields: communication, information science, political science and management, to which we could add law. Abrahamson and Fisher (2007) trace back the study of gatekeeping behaviors to the 1920s, in the work of Parks on journalism (Parks, 1922). Most researchers agree that the gatekeeper terminology first appeared in Lewin's 1947 work. In his seminal work, Lewin (1947) studied the process by which food arrives on the table in a household. He discovered that the decisions leading to the final result are influenced by gatekeepers who regulate information flows. Lewin later applied this concept to journalism (Lewin, 1950), to describe the process which brings information on the front page of newspapers. Shoemaker (1991) identified five types of research regarding gatekeepers since the work of Lewin: i) at the individual level, aiming at understanding how individuals select information. The influence of interpretation, personality, background, values, role conceptions and experiences is analyzed by this research trend; ii) at the level of routines; iii) at the organizational level; iv) at the institutional level, which refers to exogenous characteristics of organizations and their representatives; v) at the level of social systems, which refers to the influence of ideology and culture.

In management sciences, the notion was first introduced to study persuasion and mass media communication flows. The central and influential role of gatekeepers in information diffusion was underlined as far as 1950. White's study shows the importance of the information selection decisions in newspapers (White, 1950). In this vision, the main role of gatekeepers is to control the access to organizations, and can thus be perceived as a barrier to overcome (Donohue, Olien & Tichenor, 1997). Consistent with this approach of the gatekeeper as a sentinel of a unit's frontiers, part of the literature sees the gatekeeper as an obstacle to information exchange (Awazu, 2004) or to access to decision-makers within the organization.

Contrasting with this approach, another well-developed research stream focuses on the role of gatekeepers in Research and Development settings. The role played by gatekeepers is primordial in innovation (Utterback, 1971). Allen (1967, 1969) introduced the term of

"technical gatekeeper", defined as individuals who have a wide network outside the group or organization and who are also chosen as internal references by their colleagues. In R&D contexts, the information flow between the organization and its environment can go through these "technical gatekeepers" (Utterback, 1971). Gatekeepers are connected both externally and internally, and capable of diffusing knowledge and information within the organization (Katz & Tushman, 1980), even though the primary objective of their lookout for information is for personal use (Macdonald & Williams, 1993).

The gatekeeper notion is widely used in research focusing on organizational learning and innovation in geographical clusters. In this context, gatekeepers are either organizations (Morrison, 2008; Rychen & Zymmerman, 2008) or individuals (Abittan & Assens, 2011).

#### 4.2 The role of the gatekeeper

Gatekeepers can play two main roles: i) guarding and controlling information, ii) collecting and diffusing information coming from outside the organization (Barzilai-Nahon, 2008).

Gatekeepers are experts at gathering, understanding and interpreting external information, and translating the knowledge to other members of the organization, adapting the new information or knowledge in ways that will seem acceptable and understandable (Cohen & Levinthal, 1990). This is materialized by a two-step process (Katz & Tushman, 1980). This two step process takes place informally, members of the organization turning to individuals who are experts in their area (Katz & Tushman, 1980). Gatekeepers can presently rely on a mix of human contacts and search using new technological tools (Whelan, Collings, & Donnellan, 2010).

Barzilai-Nahon (2008) identified several activities relating to the control of information by gatekeepers. These activities include information selection, joining of information, withholding of information, shaping the information, localization (or translation) of the information, adapting to a particular context, channelling information, information repetition, and timing of information (Barzilai-Nahon, 2008).

Gatekeepers experience a higher level of perceived uncertainty than other collaborators (Brown & Utterback, 1985). They play a "buffer" role, absorbing and reducing the level of uncertainty for their colleagues (Tushman, 1979). This phenomenon can be explained by the

fact that information conveying uncertainty isn't communicated to other members of the organization (Boulton, Lindsay, Frankun, & Rue, 1982).

On top of these roles, gatekeepers can facilitate the external communication of other members of the organization (Blau, 1963). In R&D projects, gatekeepers have a positive impact on other team members' ability to communicate directly with their external environment (Katz & Tushman, 1980).

#### 4.3 The performance of gatekeepers

To be a gatekeeper, one has to develop specific competencies, in particular, the ability to communicate with external areas, which is not something natural (Katz & Tushman, 1980). Nochur and Allen (1992) point out that nominated gatekeepers can have mitigated results in terms of technology transfer across units. Several other factors might influence the performance of gatekeepers. The gatekeeper's behavior depends on the nature of information collected (Macdonald & Williams, 1994). In her analysis of the literature, Barzilai-Nahon (2008) points out six forces which influence gatekeeping : i) subjective factors, such as trust and personal judgement of the gatekeeper, ii) information characteristics (clarity, visual, number), iii) external constraints (cost, time constraint...), iv) organizational characteristics and procedures (role, policy, standards), v) institutional environment (opinion leaders, group consensus, market pressure), vi) social environment (newsworthiness, cultural differences).

#### 4.4 The importance of gatekeepers in knowledge transfer and organizational learning

Cohen and Levinthal (1990) and Katz and Tushman (1980) put into perspective the role of gatekeepers. Their role has to be situated in the larger context of the organization, and especially, compared with the knowledge and expertise of people within the firm. Katz and Tushman (1980) hypothesize that having a gatekeeper is necessary in contexts where new knowledge is needed, uncertainty is high and the task expertise lies within the unit (vs. higher in the hierarchy). When core knowledge changes slowly over time, hierarchy is the best linkage to external information. When "universal" norms exist which facilitate communication between individuals (for example, in scientific research), the need for a gatekeeper is lessened, and having a gatekeeper in this case can even be counterproductive. Cohen and Levinthal (1990) also differentiate three types of situations: i) In situations where all collaborators have sufficient previous knowledge to grasp external information, the role of the gatekeeper could be limited to environment monitoring. ii) When the knowledge gap

between individuals inside the organization and external actors is high, a gatekeeper is needed. She both monitors the environment and "translates the technical information into a form understandable from the rest of the group" (p.132). iii) There are also situations where centralizing the interface with the environment could be an obstacle to the firm's absorptive capacity, "when information flows are somewhat random and it's not clear where in the firm...a piece of outside knowledge is best applied" (ibid). In this context, the researchers suggest to put in place a number of "receptors" in relation to the environment (ibid). The more uncertain the environment, the more contacts with sources of information outside the firm will be sought after (Brown & Utterback, 1985; Tushman, 1977).

In order to understand the performance of gatekeepers, Barzilai-Nahon (2008) also suggests taking into account the individuals belonging to the group where the gatekeeper performs her tasks, called "the gated".

## **5. Knowledge brokers**

Researchers working on the theories of structural networks (Burt, Hogarth, & Michaud, 2000) and knowledge transfer sometimes use the terminology of "knowledge broker". Knowledge brokers can be defined as "people whose job it is to move knowledge around and create connections between researchers and their various audiences" (Meyer, 2010b) or as "people moving between the two different worlds of knowledge producers and knowledge users" (Meyer, 2010a). Brown and Duguid (1998) also point out the boundary spanning and knowledge transfer roles of knowledge brokers, but define them as actors in overlapping groups. Knowledge brokers can be individuals or organizations (Hargadon, 2002; Meyer, 2010a).

Evidence showing the existence of knowledge brokers can be dated back to the early 1800s (Lomas, 2007). More recently, a surge in research has taken place in the 1990s, and has been reinforced since 2005. Overall, research on knowledge brokers remain scarce and could be further developed. Research on knowledge brokers has initially focused on the health sector. The role of technology transfer officer, dedicated to translating research findings in the operational practice of hospitals, has been formally created in the late 1980s (Fernandez & Gould, 1994; Lomas, 2007). The concept has also been applied to education (Meyer, 2010a), technology (Pawlowski & Robey, 2004), and consulting. Recent research on knowledge brokers include analysis on the role they play inside organizational frontiers (Pawlowski &

Robey, 2004) and in the transfer of knowledge between organizations (Meyer, 2010a). Topics covered include how they contribute to knowledge diffusion as they interpret, translate and recreate knowledge (Pawlowski & Robey, 2004; Perrin, 2013).

Knowledge brokers play a major role in knowledge transfer, where they play a translating role (Perrin, 2013). Except from Brown & Duguid (1998), most researchers present knowledge brokers as "liaisons" linking two different groups without belonging to anyone (Gould & Fernandez, 1989). This can happen either between sub-groups of the organization (Pawlowski & Robey, 2004), or outside organizational frontiers (Meyer, 2010a). The research of Pawlowski & Robey (2004) on IT professionals in a manufacturing and distribution company points out the brokering practices of IT professionals : "gaining permission to cross organizational boundaries, challenging assumptions made by IT users, translation and interpretation, and relinquishing ownership of knowledge"(p. 645). The authors also show that structure and technical conditions can influence such practices.

## **6. Delineating the roles of boundary spanners, gatekeepers and knowledge brokers**

Based on our analysis of the literature, we propose a comparison of the concepts of boundary spanner, gatekeeper and knowledge broker. Table 2 synthesizes our findings.

*Table 2: Comparison of boundary spanners, gatekeepers and knowledge brokers*



	Boundary spanner	Gatekeeper	Knowledge broker
Origins of concept	Boundary spanning behavior described in the 1920s (studies on journalism). March and Simon (1958), Katz and Kahn (1966), Brown (1966) describe boundary spanning behaviors. « Boundary spanner » phrase introduced by Tushman (1977) – research on innovation.	Kurt Lewin (1947) introduced the concept: analysis of decision processes - sociology. Concept used in law, communication, management, information systems, political science. In management : Notion of « technical gatekeeper » introduced by Allen (1967), in research on innovation in R&D settings.	Brokering behaviors identified as early as the 1800s. Foundational work on brokerage by Simmel (1920s) and Merton (1960s) Notion of knowledge broker emerged in the 1990s, related to specialized roles in healthcare and education sectors.
Definition	Multiplicity of definitions. Interface between areas (within or outside the organization), permits intergroup exchanges and access to markets and resources.	Multiplicity of definitions, depending on the scientific discipline using the concept. In management : Controller/guard of information or individual who collects and diffuses information. Can apply to an individual, an organization, or a technology.	Definition depends on the context of use. Individuals who participate in multiple communities or groups and facilitate knowledge transfer. There are more precise definitions to apply in education or healthcare contexts
Theoretical fields	Strategy and organization, strategic decision making, innovation, organizational learning , negotiation	Organizational learning, innovation	Organizational learning, knowledge management
Key characteristics	<ul style="list-style-type: none"> <li>• Well-connected internally and externally</li> <li>• External, internal and linking roles</li> <li>• Facilitate communication of other group members</li> <li>• Contribute to reducing the level of organizational uncertainty</li> <li>• Interpret and translate knowledge</li> </ul>		<ul style="list-style-type: none"> <li>• Linking role</li> <li>• Interpret and translate knowledge</li> </ul>
	• Organization representative (and other roles)	• In more restricted definitions of gatekeepers, controls quality of internal knowledge	• Liaison role (doesn't belong to any group spanned)
Other references (selection)	Adams (1976), Barner-Rasmussen & al.(2010), Cross and Prusak (2007), Friedman and Podolny (1992), Jemison (1984), Kostova and Roth (2003), Leifer & al. (1978), Levina and Vaast.(2005), Tushman (1977, 1981)	Abrahamson & al. (2007), Barzilai-Nahon (2008), Cohen and Levinthal (1990), Ettlie & al. (2007), Katz and Tushman (1980), Macdonald & al. (1993), Nochur&al. (1992), Paul & al. (2010), Utterback (1971)	Brown & Duguid (1998), Hargadon (2002), Pawlowski & Robey (2004), Lomas, (2007), Meyer (2010)

Many researchers on boundary spanners and gatekeepers use both phrases as synonyms or linked concepts, gatekeepers becoming a sub-category of boundary spanners (Cohen & Levinthal, 1990; Nochur & Allen, 1992; Ramirez & Dickenson, 2010). In their analysis of past research, Levina and Vaast (2005) state that "the boundary spanner's role has been classified according to representative versus gatekeeper, advice versus trust broker, as well as scout, ambassador, sentry, and guard" (p.338). In their study of the role of boundary spanners in geographical clusters, Abittan and Assens (2011) define boundary spanners as individuals who play at least two functions within a territory or group, to be chosen between the following: *gatekeeper* (here defined as the quality controller of internal knowledge), *bridge* (who connects individuals who haven't any common language), *central connector* (who puts in relation knowledge seekers and sources of knowledge), and *expert* (who has intellectual capital and the ability to transfer knowledge to other individuals). In this context, gatekeepers are presented either as a type of boundary spanner who performs a specific role (Levina & Vaast, 2005), or as a facet of boundary spanners, which can be combined with other functions (Abittan & Assens, 2011).

Consistent with this vision, our review of the literature allows identifying overlaps between the two concepts. In a nutshell, gatekeepers and boundary spanners both impact organizational innovation thanks to their strong networks inside and outside the organization. They have a linking role between the organization and its environment, and also play an internal role, facilitating coordination and external communication of other group members. Boundary spanners and gatekeepers contribute to reducing the level of uncertainty faced by the organization thanks to the gathering of outside information. It is worth noting that both gatekeepers and boundary spanners are presented as being a rare breed, as playing these roles demands the development of specific competences, in particular, intellectual ability to gather and understand information, and the aptitude to communicate with several groups.

Whereas some researchers use the terminologies "boundary spanner" and "gatekeeper" as synonyms or interlinked concepts, other researchers point out differences in the notions. Katz and Tushman (1980) underline the differences between gatekeepers and individuals with a high boundary spanning activity. Individuals with a high boundary spanning activity, such as collaborators playing a representational role, are often isolated and are not an important source of information for other employees (Von Hippel, 1976). Awazu (2004) proposes a typology based on social network theory, which contrasts the roles of boundary spanners and gatekeepers, stating that boundary spanners "constantly seek new know-how and are not

restricted to their functional expertise and local environments" whereas gatekeepers "control knowledge that enters or leaves a network" (p.64). In the typology developed by Awazu (2004), the role of gatekeepers seems related to the internal functioning of the group, whereas boundary spanners turn proactively towards their environment. Gatekeepers are perceived as an obstacle to knowledge transfer.

Few researchers contrast the gatekeeper's role with other types of individuals, such as representatives and internal liaisons (Gould & Fernandez, 1989). Friedman and Podolny (1992) differentiate the role of representative and the role of gatekeeper. They propose that these two roles be played by different individuals to avoid role conflicts and subsequent stress. Katz and Tushman (1983) oppose gatekeepers to "internal liaisons", who connect team members only to sources of information within the organization. Hauschildt and Schewe (2000) differentiate gatekeepers from process promoters, the combination of the two models allowing change within organizations.

Gatekeepers and knowledge brokers can both span boundaries and disseminate knowledge. The main difference between gatekeepers and knowledge brokers is their position. Gatekeepers belong to one of the groups they link (Gould & Fernandez, 1989). Most research presents knowledge brokers as "liaisons" linking two different groups without belonging to any. Differences between these roles are possibly linked to the importance of the "neutral" position of knowledge brokers in some contexts. The knowledge exchange dimension of these roles might also differ. This hypothesis necessitates further research.

The themes addressed and the key questions asked by research on gatekeepers and research on boundary spanners have several differences. Our analysis of the literature shows that research on gatekeepers has mainly focused on the role they play in information gathering, translation, dissemination and control. The notion of information exchange, which implies reciprocity is not well-developed regarding gatekeepers whereas it is an important function of boundary spanners. Boundary spanners influence strategic decision making, but research on gatekeepers doesn't seem to address this topic. An important research stream on gatekeepers focuses on understanding which linking mechanisms between an organization and its environment are the best, with context as a key variable (Katz & Tushman, 1980; Cohen & Levinthal, 1990). Some recent research on boundary spanners focus on the emergence and characteristics of such individuals (Abittan & Assens, 2011; Kostova & Roth, 2003; Levina & Vaast, 2005). These research streams are complementary and shed a light on the multi-level

levers that can influence the performance of boundary spanners and gatekeepers. Our review of past research suggests that the behaviors of boundary spanners and gatekeepers vary according to individuals, general context, and local situations experienced by the individuals.

Going against the recommendation of Friedman and Podolny (1992) to separate different boundary spanning roles, Wiesenfeld (2003, 2005) underlines that boundary spanners tend to occupy managerial positions and could refuse to limit their roles, all the more if it can be a source of power in the organization. The importance of the dimension of power to understand the behavior of individuals at the frontier of organizations has also been underlined by researchers on brokers and "marginal-intersecting" individuals. For example, the theory of organizations as systems of power relations defined by Crozier and Friedberg (1977) points out the role of "marginal-intersecting" individuals (*"marginal-sécant" in French, translation by the author*), who are described as "actors who are stakeholders in several action systems linked to each others, and who can play an intermediary and translator role between several logics of action" (p.86, translation by the author). These actors gain power from their role. This definition adds a new perspective to take into account in order to understand the role of individuals at the frontier of organizations: the dimension of power games. Van Krogh (2003) also points out : "it might be more appropriate for future theory and research...to consider knowledge sharing a problem of collective action among actors with diverse and distributed interests"(p.385). This dimension is better understood in a dynamic perspective.

Few research focus on the dynamics of knowledge brokers, gatekeepers, boundary spanners or marginal-intersecting individuals. A notable exception is the research by Levina and Vaast (2005), which outlines the different steps through which "boundary spanners in-practice" emerge. The authors outline in particular that the emergence of boundary spanners within projects is concomitant with the creation of a joint field of interest between the spanned groups. The participation of individuals in the new joint field differentiates them as boundary spanners. Thus, to become a boundary spanner, Levina and Vaast conclude that individuals should develop "an inclination and ability to participate in negotiating relationships between fields" (p.352). Individuals have to become legitimate participants and negotiators in the fields they span. Their legitimacy is built on exchange of different types of capital for the former, and on their symbolic capital for the latter. This analysis, though not specifically covering gatekeepers and knowledge exchange, can be a first step to addressing the understanding of the dynamics of gatekeepers and knowledge brokers.

## **Conclusion**

The aim of our research is to clarify the use of three concepts applying to individuals playing knowledge dissemination and transfer roles at the frontier of organizations: boundary spanners, gatekeepers and knowledge brokers. Going back to the origins of these notions and to early research work on these individuals, we have outlined important overlaps and similarities. Gatekeepers and boundary spanners are rare individuals who have developed specific competences. Both play a linking role between the organization and its environment, and are characterized by their strong network inside and outside the organization. Their contribution to organizational innovation is primordial, as well as their involvement to reduce the level of uncertainty faced by the organization, thanks to the gathering of outside information. Boundary spanners have many different functions, including information exchange and access to clients and resources, whereas gatekeepers focus on information gathering and knowledge transfer. Knowledge brokers share similar characteristics as gatekeepers, but span groups to which they do not belong.

As researchers coming from many different fields refer to the notions of gatekeeper and boundary spanner, the meaning of the concepts has been modified. Several studies published recently limit the concept of gatekeeper to an information monitoring and control role within the organization (Abittan, 2011; Awazu 2004). Our analysis of the research literature contributes to clarifying the importance of gatekeepers in organizational learning, if not on other dimensions typical of boundary spanning, such as access to markets, clients, and suppliers. We also contrast the concepts of gatekeeper and knowledge brokers, underlining that these roles have strong resemblance. Going forward, further empirical research to further understand their respective contributions and differences could be undertaken.

Boundary spanners, gatekeepers and knowledge brokers are brokers and marginal-intersecting individuals who can use their position in several action systems in power games, and modify their behaviors according to their personal goals and to organizational and local contexts. Going forward, we propose that new research taking into account the dynamic nature of knowledge brokers, boundary spanners, and gatekeepers be performed, in order to understand the evolution of individuals undertaking such roles and identify the levers which might stimulate knowledge transfer and diffusion within organizations over time.

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