

Formal and Real Authority in Interorganizational Networks: The Case of Joint Ventures

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We apply a recent and more fine grained concept of authority to interorganizational networks and provide the first empirical evidence on how formal and real authority are allocated in joint ventures. Specifically, we show that intangibility of knowledge and uncertainty impact the allocation of authority in joint ventures via formal and real authority. Moreover, we provide evidence that formal authority and real authority function as complements in joint venture relationships. Copyright © 2012 John Wiley & Sons, Ltd.

INTRODUCTION

Authority is a fundamental concept in understanding organizations and networks. Going back to Coase (1937) and Simon (1951) contractual incompleteness due to uncertainty and intangibility of assets is the reason for establishing authority relationships. More recently, Grossman and Hart (1986), Hart and Moore (1990) and Hart (1995) have defined authority as the residual right of control over the use of assets. Aghion and Tirole (1997) extend this property rights view by differentiating between formal and real authority in intraorganizational relationships. An agent, for instance, an employee in hierarchical relationships or a joint venture (JV) partner or a franchisee in network relationships, has real authority when he/she has effective control over decisions and he/she has formal authority when he/she has the actual right to decide. Consequently, the allocation of authority in interorganizational networks refers not only to the design of

formal decision making procedures but also to the network partner's effective control over decisions.

The aim of this study is to apply the authority view of Aghion and Tirole (1997) to JVs and to provide empirical tests of the determinants of formal and real authority in JV relationships. In line with the property rights theory, we argue that the allocation of formal and real authority depends on non-contractibility of knowledge due to uncertainty and intangibility (Grossman and Hart, 1986; Aghion and Tirole, 1997; Stein, 2002). The less contractible the knowledge of the network partners, the more decision rights as formal and real control must be transferred to the partners. In addition, on the basis of the complementarity view of organization design (Milgrom and Roberts, 1990, 1995), we argue that formal and real authority function as complements in JVs. Our empirical evidence from JVs in Central and Eastern Europe (CEE) countries supports the theoretical predictions that formal and real authority should be delegated to the network partner who has highly intangible knowledge and whose business environment is characterized by high uncertainty. We also find evidence of complementarity between formal and real authority.

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This study makes the following important contribution: We apply the Aghion and Tirole (1997) view on formal and real authority to interorganizational networks (such as JVs). To the best of our knowledge, this study is the first one to empirically show how JV-companies allocate formal and real authority between the JV-partners. This study also contributes to the measurement issues regarding operationalization of formal and real authority. Compared with Li *et al.* (2009), who investigate formal and real authority in internal hierarchies, we develop measures for formal and real authority in interorganizational networks.

The rest of the paper is organized as follows: Section 2 discusses the concept of authority in organizational economics. Section 3 applies the Aghion and Tirole (1997) view in JV-relationships and develops the hypotheses. Section 4 presents the results of the empirical study on Austrian JVs in CEE. Section 5 discusses the results and Section 6 concludes.

THE CONCEPT OF AUTHORITY IN ORGANIZATIONAL ECONOMICS

There is a huge literature in organizational economics that deals with decision making and authority in organizations (Simon, 1951; Williamson, 1975; Grossman and Hart, 1986; Hart and Moore, 1990; Menard, 1994; Aghion and Tirole, 1997; Rajan and Zingales, 1998; Baker *et al.*, 1999; Dessein, 2002; Nagar, 2002; Stein, 2002; Zbojnik, 2002; Christie *et al.*, 2003; Colombo and Delmastro, 2004; Vazquez, 2004; Harris and Raviv, 2005; Acemoglu *et al.*, 2007; Bloom *et al.*, 2010; Van den Steen, 2010; Bolton and Dewatripont, 2011; Graham *et al.*, 2011; McElheran, 2012) and interorganizational networks (Lerner and Merger, 1998; Arruñada *et al.*, 2001; Elfenbein and Lerner, 2003; Windsperger, 2004, 2012; Young and Tavares, 2004; Higgins, 2007; Baker *et al.*, 2008; Hu and Hendrikse, 2009; Windsperger *et al.*, 2009; Mumdziev and Windsperger, 2011; Menard, 2012). In this section, we do not aim to survey this literature, but instead focus on studies that are relevant for our paper.

Starting from Barnard (1938), Simon (1951) explains authority by differentiating between sales contracts and employment contracts. Employment relationships are based on incomplete contracts containing an 'area of acceptance' (p. 294) due to the impossibility to foresee all decision actions under the various environmental circumstances. Contractual incompleteness results from high costs of using the price mechanism under uncertainty and, hence, requires establishing authority

relationships by using decision procedures (Coase, 1937; Grandori, 2010).

Grossman and Hart (1986) and Hart and Moore (1990) develop the concept of residual rights of control over assets. They argue that the owner of an asset is always able to exercise efficient control (Hart and Moore, 1990). This incomplete contracting view assumes that decisions can be contracted and the person who has the ownership rights in terms of formal authority automatically possesses effective control over decisions in terms of real authority. Under uncertainty, however, the person who has the ownership rights does not need to have the relevant knowledge and, hence, the real authority that maximizes the residual income. Baker *et al.* (2008) extend this property rights view by discriminating between decision rights and ownership rights (in the form of payoff rights) as major components of a governance structure. Governance structures are, therefore, conceptualized as contractual allocations of control between firms (Baker *et al.*, 2011). The contractual rules are the instrument for delegating control via decision rights. Co-location of knowledge and authority is essential for designing an efficient governance structure (Jensen and Meckling, 1992; Barzel, 1997; Windsperger, 2004).

Rajan and Zingales' (1998) concept of access to critical resources is closely related to the concept of authority. They argue that power stems from control over (access to) critical assets that generate the residual income stream, but not primarily from asset ownership. Hence, the regulation of access, as ability to use a critical resource, refers to the problem of authority in organizations. Furthermore, Stein's concept of 'soft' information is also related to the concept of contractibility of knowledge in the property rights theory (Stein, 2002). Stein (2002) argues that decentralization is more likely under 'soft' than under 'hard' information because 'soft' information cannot be directly verified by anyone other than the agent who produces it.

Moreover, Dessein (2002) addresses the question of how uncertainty and agency problems influence the allocation of authority. He argues that a principal will transfer authority to the agent when the agent is in possession of more intangible knowledge, and consequently chooses delegation over communication, especially if he/she acts in a highly uncertain environment. The principal, however, can only expect that delegation outperforms communication if his/her preference structure is closely aligned with that of the agent. Without divergent preferences, communication will be favored by the principal if environmental uncertainty is perceived as low, whereas delegation will

generally lead to better results in situations of high environmental uncertainty. A critical issue in intraorganizational and interorganizational networks is the question, if 'full' (i.e., formal and real) authority should be delegated to an agent, or if the principal should have some ultimate form of authority that grants him the right to either rubberstamp or disapprove a decision made by an agent. The latter refers to the case of 'delegation with veto-power' (Dessein, 2002, p. 827).

To summarize, we can conclude that, except the studies of Menard (1994) and Aghion and Tirole (1997), which will be discussed in the next section, most of the empirical work in organizational economics focuses on the various factors that influence the allocation of authority, but does not explicitly differentiate between formal and real authority.

FORMAL AND REAL AUTHORITY: THEORY AND HYPOTHESES

Menard (1994) was one of the first authors in organizational economics who made the distinction between hierarchy and authority. He states that hierarchy needs to be differentiated from authority because of the distinct coordination functions, although both aspects similarly refer to organizational practices for dealing with uncertainties and unexpected situations. According to Menard (1994, p. 236), an 'agent is said to have authority when that agent can, without requesting submission, induce other members to behave differently from the way they would have done spontaneously'. Hierarchy on the other hand is defined as a 'relation of order: it creates the architecture of an organization, in that it defines an oriented graph for decision making' (p. 238). Thus, authority refers to the 'capacity to influence' (p. 233) as 'real authority' in the sense of Aghion and Tirole (1997), whereas Menard's concept of hierarchy has to do with 'the right to make decisions' (p. 237), which is related to the concept of 'formal authority' of Aghion and Tirole (1997).

Aghion and Tirole (1997) specify and delineate authority by defining it either as formal authority as 'an explicit or implicit contract allocating the right to decide' (p. 2) or real authority.¹ The person with real authority is the person who has effective control over decisions because he/she possesses the relevant knowledge that cannot be easily transferred to another person. For instance, JV-partner 1 (JV1) would accept and approve a decision, which has been taken by JV-partner 2 (JV2), and consequently rubberstamp it, as JV2 has more decision making capabilities to take a

decision in the first place. In this case, JV2 has no formal authority but real authority. Accordingly, formal authority and the possession of the relevant knowledge to take the best decision in a specific situation may not be co-located in intraorganizational and interorganizational networks. This is because authority is exercised not only by a person who has an *ex ante* specified right to decide (i.e., formal authority) but also by someone who was not specifically assigned the right to decide but has the relevant knowledge to take a decision (real authority).

Determinants of Formal and Real Authority

In the following, we empirically investigate the allocation of authority in international JVs, where Austrian companies enter the CEE countries with a JV. Therefore, we distinguish between two network partners: An Austrian JV1 and a foreign JV2. Our analysis examines two key variables that impact the allocation of formal and real authority between JV1 and JV2, namely uncertainty and intangible knowledge.

Uncertainty. On the basis of Simon (1951), Williamson (1971, 1973, 1975, 1991) develops an adaptation view of the firm by arguing that internal organization better facilitates 'adaptive, sequential decision-making' (Williamson, 1975, p. 40), especially in situations of high environmental uncertainty (Gibbons, 2005, 2010). According to the adaptation view, higher environmental uncertainty requires more adaptability and local responsiveness. This view suggests that more decentralized decision structures are more effective under high uncertainty. This is compatible with Dessein (2002) who argues that delegation will generally lead to better results in situations of high environmental uncertainty. Similarly, Acemoglu *et al.* (2007) argue that firms delegate authority to managers when the environment is more heterogeneous. Applied to JVs, under a highly uncertain foreign market environment, the Austrian JV1 will delegate a higher proportion of decision rights to the foreign JV2. By having more decision authority, the JV2 can react more quickly to the changes in the market and retain the necessary flexibility. Accordingly, we hypothesize

H1

JV1's formal and real authority decrease with environmental and cultural uncertainty in the foreign market.

Intangible Knowledge. According to the property rights perspective, the governance structure is determined

by the intangibility of knowledge. Intangible knowledge, or 'soft' information, will be transmitted and used differently compared with easily codifiable knowledge ('hard' information) (Stein, 2002; Agarwal and Hauswald, 2010). The knowledge attributes therefore impact the governance structure via the allocation of formal and real authority. Because of the difficulty of transferring intangible knowledge, formal decision rights must be transferred to the partner alongside with the intangible knowledge. In this case, potential agency costs, which arise from divergent preference structures, are more than compensated by the residual income-increasing effect of lower information loss under delegated decision rights (Dessein, 2002). By contrast, contractible knowledge (or 'hard' information) results in the transfer of knowledge to the JV-partner with formal decision rights (Jensen and Meckling, 1992), because knowledge transfer costs are low and potential agency problems can easily be controlled by the decision maker. Accordingly, we hypothesize

H2

JV1's formal and real authority increase with his/her intangible knowledge and decrease with the JV2's intangible knowledge.

Complementarity between Formal and Real Authority

Because the governance structure of organizations and networks refers to the structure of formal and real authority, the question to ask is which relationship exists between formal and real authority. This point was also raised by Menard (1994) who argues that complementarity between both forms of authority often exists.

On the basis of the complementarity view of organization design (Milgrom and Roberts, 1990; 1995), an efficient organization design requires the use of complementary organizational practices. Milgrom and Roberts' complementarity theory predicts that investments in one organizational practice (e.g., skills of employees) will generate increased residual income of the firm only if they are bundled with investments in other organization design variables, such as decentralized decision making and performance-based incentives (Arora and Gambardella, 1990; Brickley *et al.*, 1995; Caroli and Van Reenen, 2001; Breshnahan *et al.*, 2002; Bloom *et al.*, 2010; Forsman and McElheran, 2012). Complementarity therefore means that companies choose a bundle of organizational practices that fit together.

Applied to the relationship between formal and real authority in JVs, the JV-partner will be motivated to use his/her intangible knowledge in decision making more efficiently if he/she also has the formal authority, and the JV-partner with the formal authority will take more efficient decisions if he/she also has the decision making capabilities and hence the real authority (Van den Steen, 2010). Complementarity is particularly important in the context of uncertain environmental conditions with respect to the application of intangible knowledge (Agarwal and Hauswald, 2010). Accordingly, we hypothesize

H3

JV1's formal authority and real authority are positively related.

EMPIRICAL ANALYSIS

Data and Measurement

The data for our study were collected from Austrian companies that established JVs with partners in Czech Republic, Slovakia, Poland, Hungary or Slovenia between 1985 and 2004. Data collection proceeded by sending out self-administered questionnaires to 250 executives of Austrian JV-parent companies, of which 60 were returned, which resulted in a return rate of 24%. The 60 JVs are located in the following countries: Czech Republic 19, Slovakia 6, Poland 14, Hungary 15 and Slovenia 6. In order to test the hypotheses regarding formal and real authority, we include the following independent variables in our multivariate regression model: Environmental uncertainty, cultural distance and JV-partners' intangible knowledge. We include experience, age and sector as control variables. Formal authority and real authority are a measure for the respective authority from the point of view of the Austrian JV1. Descriptive statistics are summarized in Table 1. Correlation coefficients for the independent variables can be found in Table 2. These do not indicate concerns about multicollinearity.

Formal and Real Authority. (i) Formal authority refers to the extent to which the following management positions are assigned to the JV-partners (JV1, JV2): General manager, deputy general manager, production and logistics, marketing, financing, strategy, organization and human resource management. The more these positions are filled by the Austrian JV1 compared with the foreign JV2, the higher the formal authority of

Table 1. Descriptive Statistics

Variable	N	Mean	Standard deviation
Formal authority	54	0.4830	0.31965
Real authority	60	1.4417	1.98707
Environmental uncertainty	60	3.2389	0.80055
Cultural distance	59	2.5763	0.89449
JV1 knowledge	60	5.0816	1.05224
JV2 knowledge	57	3.5806	1.14471
Experience	59	4.5847	0.68325
Age	58	9.4828	4.16013
Sector	60	0.3800	0.49000

JV1. Cronbach Alpha is 0.824. (ii) Real authority is operationalized by the relative influence of JV1 compared with JV2 on decision making in the JV regarding the following value chain activities (measured on 7-point Likert scales): JV strategy, organizational form, product program, personnel recruiting, personnel remuneration, personnel training, production program, product prices, marketing activities, advertising activities, selection of suppliers, investment projects, selection of outside creditors, investment funding, deployment of accounting and controlling systems, and selection of cooperation partners. We calculated the difference of the resulting scores between JV1 and JV2 to obtain the relative influence score. Cronbach Alpha is 0.869.

Uncertainty. Uncertainty includes environmental and cultural factors in the foreign country (measured on 5-point Likert scales). Environmental uncertainty refers to JV1’s perception of uncertainty of the foreign market concerning variation of market prices, number of competitors, product development and predictability of demand. Cronbach Alpha is 0.683. Cultural uncertainty refers to JV1’s perception whether the cultural distance between Austria and the foreign country is high.

Intangible Knowledge. JV-partners’ intangible knowledge refers to the know-how contribution of JV1 and JV2 regarding the following value chain

activities: Production and logistics, procurement, marketing, personnel recruitment, sales, services, corporate planning, controlling, funding, research and development, organization design, strategic planning, local market knowledge and relations with local authorities (measured on 7-point Likert scales). Cronbach Alpha for JV1 intangible knowledge is 0.867 and for JV2 intangible knowledge is 0.899.

Control Variables. *Experience* is a measure for the international experience of the Austrian JV-partner. It refers to the number of years of general experience and the number of years of foreign experience in the country of the JV2. *Age* refers to the year of the foundation of a JV in a foreign market. *Sector* differentiates between service sector and manufacturing sector.

Results

To test our hypotheses (H1, H2), we carry out a multivariate generalized linear model, which has the advantage of simultaneously analyzing two correlated, dependent variables among the same set of independent variables, and thus also taking into account the interrelation of the dependent variables, in contrast to running separate regression models (Hair *et al.*, 2006).

Table 3 summarizes the results of the regression models. First, the data provide partial support for H1. Environmental uncertainty, as well as cultural distance, both negatively impact JV1 real authority. Neither of those two sources of uncertainty, however, influences the allocation of formal authority in the JV. Second, H2 is also partially supported. Consistent with this hypothesis, we find that JV1 formal and real authority decrease with increasing JV2 intangible knowledge. JV1 intangible knowledge, however, only positively impacts his/her real authority, but does not impact his/her formal authority.

Third, we test the complementarity hypothesis, H3. Several studies (Arora and Gambardella, 1990; Hitt and Brynjolfsson, 1997; Ichniowski *et al.*, 1997;

Table 2. Correlation Coefficients of Independent Variables

	Environmental uncertainty	Cultural distance	JV1 knowledge	JV2 knowledge	Experience	Age	Sector
Environmental uncertainty	1						
Cultural distance	0.046 (0.729)	1					
JV1 knowledge	0.031 (0.812)	-0.159 (0.230)	1				
JV2 knowledge	0.035 (0.798)	-0.263 (0.048)	-0.019 (0.886)	1			
Experience	-0.107 (0.420)	-0.073 (0.588)	-0.139 (0.293)	0.101 (0.459)	1		
Age	-0.079 (0.553)	0.003 (0.983)	-0.128 (0.339)	-0.090 (0.512)	0.476 (0.000)	1	
Sector	0.076 (0.565)	-0.088 (0.506)	-0.156 (0.235)	0.119 (0.376)	0.233 (0.075)	-0.052 (0.697)	1

Table 3. Multivariate Generalized Linear Model Results

Independent variables	Dependent variables		
	Wilks lambda	Formal authority	Real authority
Intercept	$F(1.863)=0.913$ ^b 0.087	^a 1.007 * ^b 0.086	^a 2.768 ^b 0.034
Environmental uncertainty	$F(4.499)=0.813$ ** ^b 0.187	^a 0.012 ^b 0.001	^a -0.589 ** ^b 0.124
Cultural distance	$F(3.233)=0.858$ * ^b 0.142	^a -0.086 ^b 0.080 *	^a -0.520 ** ^b 0.137
JV1 intangible knowledge	$F(5.958)=0.765$ *** ^b 0.235	^a 0.058 ^b 0.044	^a 0.651 *** ^b 0.228
JV2 intangible knowledge	$F(17.724)=0.524$ *** ^b 0.476	^a -0.098 ** ^b 0.143	^a -1.014 *** ^b 0.470
Experience	$F(4.117)=0.826$ ** ^b 0.174	^a -0.077 ^b 0.031	^a 0.480 ^b 0.058
Age	$F(0.428)=0.979$ ^b 0.021	^a 0.010 ^b 0.017	^a 0.006 ^b 0.000
Sector	$F(0.106)=0.995$ ^b 0.005	^a -0.008 ^b 0.000	^a -0.170 ^b 0.005
			N = 48

^{Adj.} R^2 (formal authority) = 0.139.

^{Adj.} R^2 (real authority) = 0.570.

All F statistics for Wilks' lambda were exact.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

^a... β coefficients.

^b... Partial η^2 .

Forsman and McElheran, 2012) empirically measured interactions between organizational variables. Following Arora and Gambardella (1990) and Arora (1996), we test the interaction effect between formal authority and real authority by using partial correlations. Because a simple correlation might be spurious, we compute the conditional correlation between the formal and real authority variables (Hitt and Brynjolfsson, 1997). Therefore, using the partial correlation allows us to control for the effect of all other variables, such as intangible knowledge, uncertainty, experience, age and sector. The correlation of 0.565 ($p=0.000$) is highly significant and thus provides strong evidence for a positive relationship between formal and real authority.

DISCUSSION

The aim of the study is to explain the allocation of authority in interorganizational networks, in particular, in international JVs. We apply the view of Aghion and Tirole (1997), who differentiate between formal and real authority. Our analysis examines two central factors that influence the allocation of formal and real authority, namely uncertainty and intangible knowledge.

First, with respect to the impact of uncertainty, we find that increasing environmental uncertainty in the foreign market leads to the allocation of less real

authority to the Austrian JV-partner (JV1), and that higher uncertainty which stems from cultural distance decreases the extent of delegated formal and real authority to JV1. Environmental uncertainty, however, shows no significant influence on the allocation of formal authority. It is possible that foreign environmental uncertainty is difficult to predict and formalize for JV1, which would imply that it is difficult to react to changes in the foreign market environment via formalized decision making procedures. This inability to react via the allocation of formal authority can, however, be compensated by allocating more real authority to the foreign JV-partner (JV2).

Second, we find that intangible knowledge is co-located with real authority, meaning that increasing foreign JV-partner (JV2) intangible knowledge, relative to the Austrian JV-partner (JV1), results in less real authority of JV1. In addition, we find that more intangible knowledge possessed by JV2 decreases the extent of JV1's formal authority. The fact that the JV1's intangible knowledge shows no significant effect on the allocation of formal authority may be attributed to an endowment effect (Fehr *et al.*, 2012). Once, some formal authority has been established for the JV-partner, based on certain acquired knowledge, he/she will not relinquish it, as it consolidates the obtained power via formalization. Thereby, he/she maintains the possibility to ultimately overrule a decision being taken by the foreign JV-partner.

Third, the higher variance explained in the case of real authority (0.570), as compared with formal authority (0.139), indicates that there are other factors that impact the allocation of formal authority, such as the aforementioned endowment effect, the intrinsic value of authority (Herz *et al.*, 2011), the leadership style (Anderson and Brown, 2012), blame shifting as a motive for delegating decision rights (Bartling and Fischbacher, 2012) and the inability of JV1 to gain access to the specific foreign market knowledge. In the latter case, JV1 simply ‘rubber-stamps’ the JV-partner’s decisions (Dessein, 2002). Consequently, formal authority and the possession of the relevant knowledge to take the best decision in a specific situation may not be co-located within the JV-network.

Fourth, we also find that formal authority and real authority are strongly interrelated. Formal authority and real authority function as complements, so that an increase of real authority is generally supported by an increase of formal authority. This means that the JV-partner with the intangible knowledge will use his/her decision making capabilities more efficiently if he/she also has the formal authority, and the JV-partner with the formal authority will make more efficient decisions if he/she also has the relevant knowledge and hence the real authority.

Our study has some important limitations. First, in addition to environmental and cultural uncertainty, uncertainty rooted in the relationship between the JV-partners might impact the allocation of formal and real authority. Unfortunately, such data were not available for this study. In addition, future research also has to include additional control variables, such as leadership style, intrinsic value of authority and blame shifting as a motive for delegation, which may influence the allocation of authority (Herz *et al.*, 2011; Anderson and Brown, 2012; Bartling and Fischbacher, 2012). Second, our sample is relatively small, as it only includes 60 Austrian JVs in five Eastern European countries. Third, we focused on JV-partnerships as a specific form of interorganizational networks. It would be necessary to study different interorganizational relationships (such as strategic alliances and franchise networks) in order to increase the generalizability of our results. Fourth, data were only collected from the Austrian JV-partners. Future studies should collect data from both JV-partners to obtain a more holistic view of the allocation of authority in JVs. Fifth, case studies on formal and real authority in interorganizational networks could complement large-scale empirical studies. In particular, they can help to

develop valid measures for real authority, which can be subsequently used in hypotheses testing.

CONCLUSION

This paper applies the view of Aghion and Tirole (1997) on formal and real authority to international JVs. Overall, our results indicate that uncertainty, because of environmental uncertainty and cultural distance, and intangibility of knowledge are important determinants of the allocation of formal and real authority in international JVs. This study also provides evidence of complementarity between formal and real authority in JV-relationships.

How does our study contribute to the literature? First, our study presents—to the best of our knowledge—the first empirical test of the Aghion-Tirole view (1997) on formal and real authority applied to interorganizational networks. Second, on the basis of the complementarity theory of organization design, we show that formal and real authority function as complements in JVs. That means that the JV-partner with the intangible knowledge will use his/her decision making capabilities more efficiently if he/she also has the formal authority, and the JV-partner with the formal authority will take more efficient decisions if he/she also has the decision making capabilities and hence real authority. Third, this study also contributes to the measurement issues regarding operationalization of formal and real authority. Compared with Li *et al.* (2009), who investigate formal and real authority in internal hierarchies, we develop measures for formal and real authority in interorganizational networks.

NOTE

1. Similarly, Baker *et al.* (1999) distinguish ‘informal authority’ from formal authority.

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