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# Languaging Network Learning: The Emergence of Connectivism in Architectonic Thought

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## Abstract

As technological advancements and online education transform higher education, the achievement gap among students is widening rather than closing. Critics suggest that we need to reassess the promises of online education and the connectivism or network learning that is sometimes employed as its pedagogical underpinning. As scholars and practitioners struggle to define connectivism as a learning theory, many often exclude language as a feature in its conceptualization. This practice is at odds with architectonic thought, the philosophical tradition in which constructivist theories of learning are rooted. This article reveals the central role that language and texts play in architectonic thought and why they are inseparable from our understanding of knowledge and network learning. When we recognize language as a medium and model for reflection and criticality in the architectonic tradition, we are better positioned to use pedagogy and computer technology to transform online education and reorient our competing views of connectivism.

*Keywords:* connectivism, digital management, hypertextuality, intertextuality, network learning

# Introduction

In their 2019 study, Protopsaltis and Baum determined that technological advancement and online education had created as many problems as they had solved. While students had more access to higher education, Protopsaltis and Baum (2019) claimed that the achievement gap among them was widening and online education was becoming increasingly unaffordable in some sectors. More importantly, the authors predicted that these problems and others were likely to proliferate as colleges and universities expanded their online programs. Protopsaltis and Baum (2019) offered recommendations that inspire further investigations of the relationship between pedagogy and computer technology. In their study of this relationship, Bernauer and Tomei (2015) indicated that pedagogical discussions did not occur as much as they should have among faculty in higher education. Defining *pedagogy* as the art and science of teaching, Bernauer and Tomei (2015) claimed that professors often did not receive pedagogical training for their roles as teachers. What is even more concerning is the authors' insinuation that faculty were not sure what an effective pedagogy conditioned by computer technology actually involved. In fact, we are uncertain whether our current learning theories are able to help us to find answers.

For example, Siemens (2005, 2008) and Downes (2012) introduced "connectivism" as the learning theory needed for the digital age. Unlike behaviorist, cognitivist, and constructivist approaches to learning, connectivism responds to the diverse ways in which knowledge is created, adapted, and exchanged through networks. Networks simply describe how knowledge and computer technology shape entities and connect information sources. As a result of the connections that one makes, learning or "actionable knowledge" is initiated. For Downes (2012), these connections and their patterns constituted "network learning." However, critics such as Kop (2011), Bell (2011), and Goldie (2016) suggested more caution in the rhetoric used to describe and discuss connectivism, particularly as it is conceived by Siemens and Downes. Mattar (2018) pointed us toward the central question that animates the competing views that we find among the various critical perspectives that color our interpretations of connectivism. That question is: Is connectivism a new theory of learning or an extension of constructivism? While there are those critics who argue that connectivism lacks a substantive theoretical foundation, others contend that connectivism is actually the latest development of constructivism (pp. 210-211). For example, Mattar (2018) valued connectivism as a form of constructivism, but he acknowledged that constructivism requires qualification (also see Hopkinson, 1999). He wrote, "Constructivism can be considered a major theory of learning, and in a broader sense a philosophy of education, used as a general title to classify several other theories" (p. 204). Mattar (2018) described four types of constructivism: cognitive, radical, situated, and co-constructivism. He went on to review four related metaphors that Siemens (2008) and others found most beneficial in reconceptualizing the role of educators in the age of network learning. Respectively, they are master artist, network administrator, concierge, and curator.

For Hui (2016), this list might appear incomplete. It should also account for the growing need for educators to be "philosophers" of digital objects. Digital objects are forms of data that can be made visible and invisible with technology. Digital objects now permeate all aspects of human life, including videos, images, and text files. They are the sources for the development of networks and connectivity through technology and digitalization (Hui, 2016). Because they raise new questions about the nature of being and social interactions in network culture, digital objects are inseparable from philosophy and discursive relations. The two are interwoven (Stiegler, 2016). Ravenscroft (2011) supported this assessment in his

dialogic study of constructivism and connectivism. According to Ravenscroft (2011), "thinking in networks will usually mean thinking through collaborative dialogue" (p. 142). He might also agree that our understanding of networks and pedagogy is incomplete without understanding how "dialogue" and its relative "languaging" underpin them. While it is used metaphorically here, languaging is a term typically used to characterize the ways that words mediate cognition, thus shaping knowledge and language learning (Swain, 2006). Nonetheless, this process is inherently dialogic and indispensable to the function of society, pedagogy, and digital objects.

Unfortunately, this worldview is underappreciated in the literature that we tend to associate with connectivism (Downes, 2012; Kop, 2011; Siemens, 2005, 2008) and the use of computer technology in education (Bernauer & Tomei, 2015; Cuban, 2001; Picciano, 2019). However, Ravenscroft (2011) is one of the few scholars who positioned dialogue as a feature rather than an anomaly in both areas. He claimed, "And whilst future learning landscapes will be characterised by the greater penetration of the Web within everyday lives, fundamentally we must remember that we will still be, mostly, people socially interacting with other people" (p. 155). Dialogue and discourse will support this interaction. In order to ground this important articulation, Ravenscroft (2011) evidenced the ways in which influential theorists such as Mikhail Bakhtin and Lev Vygotsky offered us the kind of social constructivist lens that supports a dialogic view of network learning in the age of digitalization. However, their ideas are elements in a larger philosophical tradition that Ravenscroft's study did not elaborate. As a result, we are missing an opportunity to enrich our understanding of the relationship between language and connectivism with respect to constructivism. We are also missing an opportunity to recast the question that inspires our competing views of connectivism.

In other words, we should no longer ask whether connectivism is a new theory of learning or an extension of constructivism. The more significant question is: Where does connectivism emerge in the architectonic tradition that made the dialogic and constructivist ideas of theorists such as Bakhtin and Vygotsky possible? Architectonic(s) is essentially a means of contemplating the various ways that we build and relate meaning, knowledge, and experiences in all aspects of life, especially in education (Derrida, 2004; Holquist, 1990; Manchester, 2003). As a metaphor for the systematic and constructivist nature of all relations, it is inherently interdisciplinary and integrative (Dennis, 2019; Klein, 1990; Watson, 1993). While one theorist may associate the term with architecture, another could just as easily appropriate it to describe the dialogic relations that help us to make meaning and communicate. In fact, this is how Bakhtin (1981, 1990) developed the term in his theory of dialogue. As Bakhtin's contemporary, Vygotsky (1986) helped us to imagine what a dialogic perspective looks like in terms of social constructivism (more on this point below). However, it may prove to be a challenge identifying this kind of interrelation without an introduction to the larger architectonic tradition that is more implicit than explicit in Ravenscroft's study. Dialogic ideas are rooted in a complex genealogy of epistemological thinking that we either fragment or ignore as educators. Therefore, we must not limit our understanding of language and connectivism to the theoretical contributions that Ravenscroft (2011) discovered in Bakhtin (1986) and Vygotsky (1978). If we do, we fail to recognize the ways in which architectonics represents a system of ideas that offers the kind of integrated philosophical perspective we often lack when we discuss connectivism and computer technology in higher education.

## Purpose

My purpose in this discussion is to provide a theoretical overview of the key concepts and metaphors that constitute architectonic thought. By reviewing the significant ways in which architectonic thinking manifests across time, we can better navigate the system of ideas that enrich and extend our understanding of the relationship between language and connectivism or network learning. When we connect rather than silo these perspectives, we effectuate the kind of critical and theoretical reflection needed to support network learning as a contemporary articulation of architectonic thought and not a new theory of learning. This reconceptualization not only challenges many of our current interpretations of connectivism, but it also strengthens the idea that the processes of language are inseparable from the processes of network learning in the digital age.

## Conceptual Framework

According to Stiegler (2016), digitalization has "exploded" our frames of thought. He asked us to rebuild them in order to prevent digitalization from widening the gap in the social and economic relations that Protopsaltis and Baum (2019) said we needed to close (p. 17). For Stiegler (2016), digitalization was more than the electronic transformation of various objects/texts through computerization. It was a disruptive process that ultimately altered the psyche, space, time, and conditions of publication. The expansion of digitalization has had the same social effect as the initial appearance of writing and the printing press. Stiegler (2016) wrote, "Digital technology is a form of writing, a writing that is produced at the speed of light, through machines to which we have delegated the process of reading and writing" (p. 160). It is within this context that Stiegler situated our understanding of digital objects (Hui, 2016, pp. vii-xii). In order to reveal why this contextualization is significant, a rhetorical approach will be used to frame and survey the key theorists associated with architectonics.

Generally, *rhetoric* describes the "strategic use of communication, oral or written, to achieve specifiable goals" (Kuypers, 2010, p. 288). Historically, rhetoric has been recognized as a speculative tool in philosophy. However, Burke (1969) noted that rhetoric is more than just a means of persuasion. It is also a form of identification. This is the method that Burke (1969) recommended for those who must "confront the implications of division" when presenting arguments (p. 22). Identification can be achieved by connecting and relating the properties of one object or idea to another. According to Burke (1969), we must view rhetoric as a body of identifications that owe their persuasiveness more to repetition and interconnectivity than to the exercise of rhetorical skill (p. 26).

Burke's theory of identification will be used as the conceptual framework for exploring the various iterations of architectonics in epistemological thought. As a theory of relations, architectonics is the master trope that pervades the Western philosophical tradition. Tropes have a double character. They are powerful rhetorical devices and they describe the iteration or reappearance of a word, idea, or metaphor. This repetition accords with Burke's identification process, and it helps us locate the system of ideas that will enrich our view of the interrelationship between language and connectivism in architectonic thought. Dialogue and texts simply model this conceptual system (Lakoff & Johnson, 1980). In order to relate the

various epistemological perspectives that develop architectonic thought, I describe Immanuel Kant's theory of cognition and how it was later appropriated by Charles S. Peirce to help form his theory of continuity and signs. As the intellectual heir to Kant and Peirce, Bakhtin made another significant change in the trajectory of architectonic thought when he suggested that it was a synonym for *dialogism* or the interrelation of voices and words. It is on the foundation of dialogism that Julia Kristeva developed her theory of the interconnectedness of texts or *intertextuality*. Around the same time, Ted Nelson developed the idea of hypertextuality, which signaled the digitalization of intertextuality and marked the emergence of the contemporary idea of connectivism in architectonic thought.

## The Origins of Architectonics

Often used in the singular, *architectonics* is a concept that permeates the Western philosophical tradition. Manchester (2003) explained why the term has been so influential. She reported that architectonics is "a technical term in philosophy with an interesting history, one with philological anomalies, historical vicissitudes, and philosophical pretensions." Manchester (2003) also stated that the use of the term and its correlates can be "found in metaphysics, jurisprudence, political philosophy, ethics, *belles lettres*, theories of living organisms, and—one suspects—life itself when 'rightly ordered'"(p. 188). According to Holquist (1990), architectonics is essentially "the science of relations" (p. 29). However, earlier meditations on the nature of architectonics can be found in the work of Aristotle and further developed in the philosophy of Gottfried Leibniz, Johann Lambert, Alexander Baumgarten, and Christian Wolff (Manchester, 2003). Generally, the term is associated with Immanuel Kant. In the *Critique of Pure Reason*, Kant (2007) tried to bridge the gap between two competing phenomena in philosophy: the separateness and unity in the knowledge that we acquire through our experiences *(a posteriori)* and knowledge that transcends experience *(a priori)*. Kant (2007) argued that there are faculties and categories in our minds that synthesize, construct, and shape what we know. In other words, our minds create the world that we experience. Kant (2007) wrote, "All knowledge arising out of reason is derived either from concepts or from the construction of concepts" (A837/B865). This process that takes place in our minds unifies our knowledge into a system. According to Kant (2007), "our diverse modes of knowledge must not be permitted to be a mere rhapsody but must form a system" (A833/B861). The metaphor that Kant borrowed from his predecessors to characterize this complex cognitive process was *architectonics*. Kant (2007) wrote that architectonics is the art of constructing systems, and systematic unity is what elevates "ordinary knowing to the rank of science" (A832/B860). Hawkins (1994) claimed that Kantian architectonics was actually one of our earliest articulations of constructivism. Noddings (1995) noted that Jean Piaget traced the epistemological roots of his theory of constructivism to Kant. Unlike Kant, Piaget did not view the categories of the mind as static. Piaget's epistemology focused on the development of knowledge and the development of individuals. Noddings (1995) wrote that Piaget's theory was constructivist in the sense that "it claims that all knowledge (and perception itself) is constructed, neither merely received nor innate" (p. 109).

Peirce (1955) reinterpreted Kant's theories along similar lines because of our changing applications of knowledge (p. 316). He wrote, "That systems ought to be constructed architectonically has been preached since Kant, but I do not think the full import of the maxim has by any means been apprehended" (p. 316).

Peirce (1955) contributed to architectonic thought by essentially adapting it in order to extend Kant's ideas. For him, architectonics served as a theory of cognition, a theory of integration, and a theory of being all at the same time. It became a way for Peirce (1955) to examine the relationship between perceptual judgments and behavior. Perceptual judgments are our thoughts. Thoughts embody certain properties or qualities. All thoughts, meanings, and feelings are qualities in Peircean thought. Peirce categorized them as Firstness, Secondness, and Thirdness. He claimed that they were the ingredients in all knowledge and experience. They describe various levels of relationships. Firstness is a monadic relation. Secondness represents a dyadic relation. Thirdness is the integration of monadic and dyadic relations. Integration is a key feature in Peircean architectonics because it characterizes the "synechism" or continuity that results from the process of combination and interconnectivity (Peirce, 1955; Short, 2007).

Peirce (1955) viewed philosophy as a way to help us to create and connect. This was one of the characteristics of his pragmatic philosophy. *Pragmaticism* is an evaluation of the rationality and practicality of truth. Peirce also claimed that it is a way to interpret the logic of arguments. One way that this can be achieved is through the study of signs or semiotics (also known as *semeiotics*). Peirce (1955) wrote, "Logic, in its general sense, is, as I believe I have shown, only another name for semiotic" (p. 98). When we think in terms of Peirce's principle of continuity, we can better imagine pragmaticism and semiotics as interconnected conceptualizations for speculating about the nature of meaning. In Peirce's three-part model of the sign, he said that a sign consists of representamen (form of the sign), interpretant (sense made of the sign), and object (that to which the sign refers). Peirce (1955) wrote, "The sign stands for something, its object. It stands for that object, not in all respects, but in reference to a sort of idea, which I have sometimes called the ground of the representamen" (p. 99). The interaction between these parts is what he called *semiosis*. According to Peirce (1955), signs translate into other signs. Signs are dialogic and so is thinking.

## Dialogism and Architectonics

Chandler (2007) argued that Peirce's idea that all thinking is dialogic resurfaces in the dialogic theory of Mikhail Bakhtin (p. 33). For Bakhtin (1981), dialogue was the interrelation of utterances or words. Dialogic relations intersect continuously across all aspects of differences. They are "profoundly unique and cannot be reduced to logical, linguistic, psychological, mechanical, or any other natural relations" (Bakhtin, 1986, p. 124). Bakhtin (1981) wrote, "languages do not exclude each other, but rather intersect with each other in many different ways" (p. 291). In fact, language and its processes serve as a continuum that interconnects disciplines, genres, and texts regardless of boundaries. This effect explains why Ravenscroft (2011) concluded that language and dialogue underpin learning and are consistent with the kind of cothinking that connectivism values (also see Matusov, 2007).

Early in his career, Bakhtin (1990) explored the dialogic potential of architectonics as a response to the formalism that he associated with Kantian thinking. Holquist (1990) stated, "Dialogism is a form of architectonics, the general science of ordering parts into a whole" (p. 29). Dialogism is a philosophy of interrelations that defines and utilizes language as a modeling system for the varied dimensions of human

existence. Holquist (1990) went on to describe the web-like nature of Bakhtinian thought. He wrote, "The mutuality of differences makes dialogue Bakhtin's master concept, for it is present in exchanges at all levels—between words in language, people in society, organisms in ecosystems, and even between processes in the natural world." Dialogue is "what keeps so comprehensive a view from being reductive" (Holquist, 1990, p. 41). As a social constructivist with ideas that often mirrored those of Bakhtin, Vygotsky provided the "clinical underpinning" to dialogism (Emerson, 1986, p. 27). Vygotsky (1978, 1986) argued that language is key to our understanding of cognitive development. Words are tools for learning and their use changes as the context for human activity changes (also see Engeström, 2008). The relationship between words and thoughts is reciprocal. Vygotsky (1986) claimed that thought comes into existence through words. He added that thoughts create relationships. They connect one thing to another (Vygotsky, 1986). Influenced by the ideas of Vygotsky and Bakhtin, Shotter (1993) claimed that words and language are the psychological tools we need to mediate the various networks that we encounter every day. As a network, words are always connected by a stream of dialogic relations that add to the flow of conversations always already in progress.

## Dialogism and Intertextuality

In her interpretation of networks, Julia Kristeva (1986) built on the work of Bakhtin. She is credited with introducing Bakhtin's theory of dialogue to Western academic audiences. In her appropriation, Kristeva (1986) wrote, "each word (text) is an intersection of word (text) where at least one other word (text) can be read" (p. 37). This assessment of Bakhtin—though controversial—serves as the foundation for Kristeva's theory of intertextuality (also see Orr, 2003). *Intertextuality* is a term that Kristeva coined to describe the interrelation of texts and the transformative and disruptive power of this process (for other influences on the concept see Alfaro, 1996, and Derrida, 1997). More significantly, Kristeva (1984) envisioned intertextuality as a form of critical practice. In intertextuality, every textual construction is a transformation. A new text is constructed in response to a prior text (p. 210). Intertextuality is an architectonic process, but Halliday (1978) also called it a "sociosemiotic process" in order to account for the shifts, irregularities, and conflicts that we encounter in all social interactions. Halliday (1978) claimed that the important feature of a text is that it is a continuous process of exchange and interaction. This mirrors the pedagogical practices that Bernstein (1990) described between those who transmit information and those who must acquire it. Bernstein (1990) wrote, "The relationship basic to cultural reproduction or transformation is essentially the pedagogic relation, and the pedagogic relation consists of transmitters and acquirers" (p. 64).

In his presentation of intertextuality, Barthes (1989) also associated texts with processes of exchange and transformation. He argued that epistemological shifts in our understanding of language and the world have resulted in a change in our understanding of texts and disciplines, which cannot exist without language and dialogue. According to Barthes (1989), the appeal and power of interdisciplinarity are causing these changes in our conceptualization of texts. It is only through activity and production that texts are effectuated and experienced. As a consequence, they resist easy classification and bureaucratization. Texts are continuously "working" and exceeding boundaries. A text never stops because meaning is always "becoming," and the complex processes of language know no cessation. For

Barthes (1989), the text is paradoxical and metaphorical. He claimed, "the metaphor of the Text is that of the network; if the Text expands, it is by the effect of a combinative operation" (p. 61).

In response, Foucault (1980) would argue that texts encounter more restrictions than Barthes's description acknowledges. Foucault (1980) imagined texts as being conditioned by a network of power. As a form of repression, power is inseparable from knowledge and the formation of texts. They are reciprocal processes. Alfaro (1996) identified Foucault as one of the theorists most responsible for applying intertextuality as a critique of political and historical relations. Foucault (1972) argued that history privileges continuity or a linear understanding of events. However, this approach to history often ignores the disruptions and discontinuities that also make history possible. According to Foucault (1972), discontinuities occur in architectonic unities that develop within systems that are antifoundational, nonlinear, and intertextual. Intertextuality is always a factor in what Foucault (1972) called "discursive formations." Discourse formations are the interrelations between statements or texts and their conditioning by rules that regulate their meaning. Foucault (1995) also argued that educational institutions are sites for the regulation of discourse and the exercise of power. Power disciplines students in ways that promote the reproduction of social and economic hierarchies. Pedagogy plays a role in this process. Gore (1998) claimed that the continuity of pedagogical practices across time and sites often involves the exercise of power to reproduce the status quo in education and society (also see Egan, 2002, and Usher & Edwards, 1994). Annesley (2001) and Cuban (2001) asked us to reconsider the faith that we invest in technology as a solution to many of the problems that we find in education and society. Based on their assessments of past innovations, Annesley (2001) and Cuban (2001) suggested that the hyperinteractivity that advanced technology allows can also intensify social inequality. This is paradoxical, considering that digitalization and hypertextuality are often conflated with democracy.

## Hypertextuality and Connectivism

In her review of Gérard Genette's theory of hypertextuality, Alfaro (1996) stated that Genette defines hypertextuality as the relationship between one text and another in a direct or indirect reconfiguration or transformation. Alfaro (1996) determined that his conceptualization was not very different from the view of intertextuality as texts "trapped in a network of relations" that we discussed above (pp. 280-281). When Nelson (1987) coined the term *hypertextuality* in the 1960s, he situated his appreciation of hypertextuality firmly in the context of technology. Hypertext, according to Nelson (1987), describes forms of electronic writing or texts that are performative and best presented on a computer screen. Hypertext is non-sequential and multidimensional blocks of texts with branches and links that offer individuals different pathways and connections to information. It has supported the infrastructure that has allowed Tim Berners-Lee's idea of a World Wide Web to become a reality. Landow (1992) said that hypertext links "a passage of verbal discourse to images, maps, diagrams, and sound as easily as to another verbal passage" (p. 4). In essence, Nelson's concept moved our perception of texts from the networking capability of verbal passages to their centrality in the transformation of learning. Foreshadowing the idea of connectivism, Nelson (1987) revealed some of the ways that his ideas impacted our presuppositions about teaching and learning. For instance, he claimed that knowledge is borderless,

and learning does not have an order. Also, classifying knowledge by disciplines is more administrative than pedagogical.

Orr (2003) went on to point out another significant contribution that Nelson made to the idea of network learning. Nelson essentially extended the logic of intertextuality into the digital world. Orr (2003) wrote, "hypertext merely develops the status of 'text' that is intertextuality's motor through digitalization" (p. 50). Hypertextuality is intertextuality reimagined for a world that rationalizes itself through computers and the vast networks that they allow. Lyotard (1984) also anticipated this same networking capacity when he predicted that knowledge and learning would be mediated through machines, thus altering the way that we organize knowledge and texts. Lyotard (1984) said that in the future it would not be enough to obtain information. Innovation would rest on how well one can organize information in new ways. Lyotard (1984) wrote, "This new arrangement is usually achieved by connecting together series of data that were previously held to be independent. This capacity to articulate what used to be separate can be called imagination" (p. 52). Those who value network learning might recognize Lyotard's logic as a central aspect of their pedagogical perspective.

Lyotard (1984) offered us an early assessment of the growing "network culture" that Taylor (2010) discussed in his critique of higher education. Taylor (2010) argued that technology has changed the way that we communicate and organize knowledge. When the organization of knowledge changes, then so must our organizational structures and operating principles in education (also see Barabási, 2014). Taylor (2010) claimed, "Network culture is characterized by the emergence of a new information and communication infrastructure that has been developing since the 1970s" (p. 68). In network culture, technology uses us as much as we use it to interconnect life and learning. In his assessment of the future of online education, Picciano (2019) claimed that technology will transfigure education and society in ways that we have yet to imagine. We are quickly reaching the point in higher education where most courses will feature an Internet component in some form or fashion. According to Picciano (2019), we are already witnessing many of these changes. Increasingly, faculty members are viewed as knowledge managers who can produce and disseminate information electronically. If Picciano's assessment is an indication of the future of teaching and learning, then the architectonic tradition and its dialogic features may very well prove to be the kind of philosophical orientation that we need.

## Conclusion

Hopefully, the review of architectonic thought presented in this discussion provides the kind of introduction that we need to more clearly recognize that, in our roles as educators, we are also "philosophers" of teaching and learning. In architectonic thought, we discover the interrelated conceptual tools that can inform our understanding of theory and practice. More significantly, architectonics offers us a framework in which we can recast our competing appreciations of connectivism. In doing so, one learns that language is much more than a medium for communication. Language actually operationalizes the networking capacities that connectivism values. The networks that language creates through dialogue and texts actually make education possible. This may explain why language is such a dominant feature in many of the theoretical perspectives that shape architectonic thought. Architectonic thinking binds

dialogism and constructivism. Intertextuality and hypertextuality reflect this bond, thus making it much more difficult to ignore the ways in which these perspectives also influence our understanding of connectivism. Like constructivism, connectivism or network learning is another iteration of architectonics. As such, we find that the idea of connectivism appears to emerge out of one of our earliest theories of hypertextuality. This evidence rebuts the argument that connectivism is a new theory of learning. It also frustrates the idea that connectivism lacks a substantive theoretical foundation. Ultimately, architectonics challenges us to expand the ways in which we imagine the relationship between pedagogy and computer technology in the future.

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