Understanding Knowledge-Sharing in Online Communities of Practice

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Abstract: Information Technology is no longer regarded solely as a repository within knowledge management but also as a collaborative tool. This change of role gives rise to online communities (OLCs), which extend the loci of existing communities of practice. To leverage the potential of these communities, organisations must understand the mechanisms underpinning members' decisions to share knowledge and expertise within the community. This paper discusses existing research and develops a theoretical model of factors that affect knowledge sharing in OLCs. The aim is to increase our understanding of the antecedents to knowledge-sharing in OLCs.

Keywords: knowledge sharing, online communities of practice, extrinsic rewards, motivation, trust, value congruence.

1. Introduction

Knowledge is widely recognised as a critical organisational resource irrespective of economic sector or type of organisation (Stewart 1997; Sveiby 1997; Davenport & Prusak 1998). It is difficult, if not impossible, to maximise the value of this resource without adequate understanding of how to leverage and share knowledge throughout the organisation. This paper seeks to promote this understanding by first discussing trends in knowledge management (KM) and examining the emerging role of online communities (OLCs). This review of existing literature leads to the development of various hypotheses as to the relationship between knowledge-sharing and its antecedent factors in OLCs.

The factors include the ease of use and perceived usefulness of the KM system, trust, the perceived proximity of knowledge-sharing to career advancement, sense of community and perceived value congruence. These factors are operationally defined and are presented as a theoretical model. Groundwork is laid for a follow-up study that will test and validate this model.

2. Developments in knowledge management

The fixed, tangible resources of the organisation are no longer considered a sustainable source of competitive advantage. Such assets quickly become available to competitors. Knowledge, on the other hand, is far harder to replicate, it is unique amongst organisational resources in that no other resource increases in value through use (Probst *et al.* 2000). Davenport and Prusak (1998) explain the central role of ideas in this process:

> *"Unlike material assets … knowledge assets increase with use: ideas breed new ideas, and shared knowledge stays with the giver while it enriches the receiver … only new knowledge resources – ideas – have unlimited potential for growth"* (p.16-17).

However, despite this realisation and the recent explosion of interest in KM, a review of the literature indicates that many KM initiatives only partially deliver on expectations (Swan & Scarbrough 1999). Many contributing factors have been posited (Szulanski 1996; Ruggles 1998; Doswell & Reid 2000) with a recurring theme being the overemphasis on the role of IT, combined with a lack of consideration for cultural and motivational factors (Newell 2001; Beaumont & Hunter 2002). New information systems (IS) tend to have the effect of reinforcing existing behavioural norms (McDermott 1999) and do nothing to change attitudes towards open communication and sharing (Ellis 2003). What is required for effective KM is a combined approach focused on both social and information systems.

2.1 KM and IS

An information system stores, processes and communicates information (Mallach 1994). KM seeks to leverage the organisation's expertise and know-how to add value to the business, utilising some form of technological support system (Ellis 2003). IS focuses on the core processes that pump the business, critical data that enables the business to effectively operate. KM focuses beyond the day-to-day operations and seeks to build the capability to improve the way the business functions. By developing the capabilities of the organisation's members, KM develops the high value-adding expertise and creativity that enables business evolution and growth. Hence, KM seeks to effectively harness IS to achieve the goal of maximising the value of the organisation's knowledge-base.

This high value-adding knowledge is less factual, and is based more on the experiential knowledge that is hard to transfer via information systems. Such knowledge can act as a sustainable source of competitive advantage (Bowman 2001). The challenge, therefore, is to understand how we can increase the context of information and communication so as to facilitate the sharing of this more elusive and tacit experiential knowledge.

2.2 CoPs, Context and OLCs

There has been a growing focus on the role of communities of practice (CoPs) within the KM domain. CoPs have been described as "groups of people informally bound together by shared expertise and passion for a joint enterprise" (Wenger & Snyder 2000). They are different from teams and functional units as they are self-organising systems whose lifespan is determined by its members, based on the intrinsic value that membership brings. Such communities are not constrained by time and space and therefore can span organisational boundaries (Wenger 1998).

CoPs have been identified as effective loci for the creation and sharing of knowledge (Lave & Wenger 1991). Such communities are able to retain dynamic and evolving knowledge within a real-time process that adds context to existing static repositories. Members identify and engage each other with a common set of codes and language. The development of a strong network of likeminded individuals who share a common understanding is conducive to the development of an environment typified by high levels of trust, shared behavioural norms, mutual respect and reciprocity (Lesser & Storck 2001). Such an environment has been identified as being high in social capital, and has been linked directly with the processes of the creation and sharing of knowledge (Nahapiet & Ghoshal 1998).

Of recent, the development of OLCs has resulted in CoPs that are mediated by IS. For OLCs to maximise their value in KM terms, practitioners need to understand the mechanisms and processes that underpin members' decisions to share what they know.

3. Knowledge-sharing

A review of the existing literature did not reveal knowledge-sharing as a well-defined construct. Therefore, in order to establish what we mean by knowledge-sharing, this section builds our understanding by discussing root definitions.

3.1 Knowledge

Knowledge is an intangible resource that exists within the mind of the individual (Sveiby 1997). The recent explosion of interest surrounding KM has brought with it much confusion with critics arguing that knowledge in itself cannot be managed and that KM is just another management fad (Wilson 2002). Indeed, there is the view that knowledge management is, by definition, an oxymoron (Malhotra 2000). Hildreth and Kimble (2002) identify a lack of distinction between KM and information management. In order to clarify this distinction it is necessary to understand how information and knowledge relate to each other.

Both information and knowledge are grounded on data. The two can be differentiated if we consider interpretation and meaning. Information by definition is informative and, therefore, tells us something. It is data from which we can derive meaning. Knowledge is directly related to understanding and is gained through the interpretation of information. Knowledge enables us to interpret information i.e. derive meaning from data. The interpretation of meaning is framed by the perceiver's knowledge. So what one person perceives as information can equate to meaningless data to another.

So information that is interpreted generates meaning and new knowledge. Thus, information can be added to knowledge to increase what is known. It is also valid to state that knowledge comes before both information and data since one needs to know the context of data before it can be interpreted as information. Hence it can be seen that knowledge is subjective and can only reside within the mind of the individual. So what do we mean by sharing knowledge, if knowledge cannot exist outside the individual?

3.2 Sharing

Sharing is a process whereby a resource is given by one party and received by another. For sharing to occur, there must be an exchange; a resource must pass between source and recipient. The term knowledge-sharing implies the giving and receiving of information framed within a context by the knowledge of the source. What is received is the information framed by the knowledge of the recipient. Although based on the knowledge of the source, the knowledge received cannot be identical as the process of interpretation is

subjective and is framed by our existing knowledge and our identity (Miller 2002).

By definition, an IS shares information. So what differentiates information-sharing from knowledge-sharing? The sharing of information covers a broad spectrum of exchanges and does not necessarily lead to the creation of new knowledge (Van Beveren 2002). Knowledge-sharing intrinsically implies the generation of knowledge in the recipient.

In face-to-face communication, an effective mechanism for gaining knowledge is to request help from another i.e. someone who may possess the knowledge or expertise required. This request may lead to a conversation that will facilitate the creation of new knowledge in the recipient.

This suggests that in face-to-face interactions, conversations can be an effective conduit for knowledge-sharing. Indeed it has been suggested that conversation may be the only effective means of sharing knowledge (Pierce 2002). Conversation is framed by a unique common context that is built between participants. It is this common context that facilitates the transfer and development of the more deeply rooted tacit knowledge. The context is built through communication and is enabled by a shared perspective, language and common understanding. It is thus through conversation that we learn how to learn together (Brown & Isaacs 1996).

Zeldin (1998) provides a useful description of the role of conversation in the creation of knowledge:

> *"Conversation is a meeting of minds with different memories and habits. When minds meet, they don't just exchange facts: they transform them, reshape them, draw different implications from them, engage in new trains of thought. Conversation doesn't just reshuffle the cards: it creates new cards."* (from www.gurteen.com).

Conversation can occur electronically via email and online discussion board tools. Within the context of an OLC, the direct mechanisms for engaging another member of the group who may possess the knowledge one seeks is to post an open question or a request for assistance on the community's discussion board. Although lacking the richness of face-to-face dialogue, the benefit of online discussion forums is that the conversation becomes accessible to the whole of the community and can be archived and accessed by other members. Similarly, a single request may generate many responses. Hence through the shared perspective, common language and context of OLCs, individuals are able to help resolve problems by sharing what they know.

Online conversations may take many forms. Through conversation we articulate "hunches, insights, misconceptions, and the like, to dissect and augment ... understanding" (Brown & Duguid 1991: 45). For example, knowledge may be shared in the form of a story describing a similar experience whereby a method or technique was developed or used to solve a problem. If unable to provide a solution directly, knowledge may be shared in relation to contacting someone who might know and be willing and able to help. The process of knowledge-sharing involves the knowledge-source using the online community system as a mechanism to effectively convey what they know. The process facilitates the creation of the necessary understanding in the recipient, enabling the development of a solution to a problem.

Hence, within the context of OLCs, knowledge-sharing can be narrowly defined as instances whereby a member responds to a posted problem by sharing what they know. Based on this conceptualisation of knowledge-sharing, the next section investigates and discusses factors that affect the decision to share knowledge within an OLC.

4. Factors affecting knowledge-sharing

Synthesising recent research, this section provides the theoretical foundations for the development of a number of hypotheses as to the relationship between a number of factors and knowledge-sharing in OLCs.

4.1 Organisational structure

Working practices are constantly changing as individuals and organisations adapt within an ever-changing environment. New knowledge is created as best practice and working methods evolve and are improved. When this creation of new best practice occurs below the level of upper management, at a more operational level, it becomes management's challenge to harness and spread this new knowledge throughout the organisation in order to leverage maximum value and advantage from it (Brown & Duguid 2000).

Organisations with a centralised, bureaucratic management style can stifle the creation of new knowledge, whereas a flexible,

decentralised organisational structure encourages knowledge-sharing, particularly of knowledge that is more tacit in nature. Thus "[i]n order to be successful in knowledge transfer … firms must be organised to be highly flexible and responsive" (Chung 2001: 2).

Furthermore, status similarity has been shown to positively relate to knowledge-sharing (Hall 2001b). Thus, organisations with a flatter, less hierarchical structure may benefit from increased levels of knowledge-sharing. Synthesising these research findings leads to the development of the following proposition:

H_1: The less hierarchical an organisation's structure, the greater the instances of knowledge-sharing.

4.2 Technical infrastructure

Information technology (IT) can facilitate collaborative work and enable the knowledge-transfer process (Chung 2001). However, such technologies are inherently limited in their ability to transfer knowledge that is more tacit in nature (Hildreth & Kimble 2002). Researchers argue that the technical infrastructure is highly dependent on the value of the content it holds (Hall 2001a) and the relationships it can foster. Two aspects of systems use have been related to the motivation to act. Firstly, the action must itself not be difficult to undertake. Secondly, the outcome of the action must be perceived to be useful (Hall 2001a). In the context of online communities, a critical mass of activity is required to attract others (Preece 2000); without critical mass, the perception of the usefulness of the knowledge-sharing system will inhibit its use. Furthermore, information quality has been shown to indirectly affect participation in online communities (Yoo *et al.* 2002). In online communities, an additional factor that is likely to influence the perceived usefulness of the system is the perception of the knowledge of a community's members. Hence, the following hypotheses can be derived:

H_2: The greater the ease of use of a knowledge-sharing system, the greater one's use of the system for knowledge-sharing.

H_3: The greater the perceived usefulness of the knowledge-sharing system, the greater a user's participation in knowledge-sharing.

4.3 Trust

Trust is a much debated construct (Kramer & Tyler 1996). It involves a willingness to make one's self vulnerable to others and involves trust in various facets of another party, namely: (1) trust in their competence; (2) trust in their openness and honesty; (3) trust in their intensions and concerns; and (4) trust in their reliability (Mishra 1996).

Trust is an important facilitator in communication. According to Mitzal, "trust, by keeping our mind open to all evidence, secures communication and dialogue" (Mitzal 1996: 10). Trust facilitates transactions and collaboration (Fukuyama 1995). This suggests that "where relationships are high in trust, people are more willing to engage in … cooperative interaction (Nahapiet & Ghoshal 1998). Indeed empirical research has linked trust with levels of inter-unit resource exchange (Tsai & Ghoshal 1998).

Following Maher *et al*. (1995), trust can be conceptualised across three dimensions, viz. integrity, benevolence and competence. Integrity-based trust is the perception that another party is honest and reliable. Benevolence-based trust relates to the perception that another party would keep the best interests of the trustor at heart. Competence-based trust is rooted in the perception that another party is knowledgeable or possesses a certain level of competence. These dimensions can be held at various levels of analysis, e.g. trust can be held in the individual, the community or the entire organisation.

Integrity-based trust has an important role to play in motivating knowledge-sharing. One is not likely to be motivated to share one's knowledge with another individual or a community if one perceives them to be dishonest or unreliable. Similarly, when one views a community as upholding trustworthy values such as mutual reciprocity, honesty, reliability and commitment, there is likely to be a greater degree of motivation to participate and share one's knowledge. Hence,

H_4: The greater one's perceived integrity in a community, the greater one's engagement in knowledge-sharing.

Fear of losing face has been identified as one of the main barriers to knowledge-sharing (Ardichvili *et al.* 2002). The fear of posting an incorrect or misleading contribution, or the belief that one's contribution may not be sufficiently important or relevant, can have a

significantly negative effect on one's motivation to share knowledge. Competence- and benevolence–based trust may both have a role to play in overcoming such fears. The higher the perceived benevolence of a community, the more likely one is to feel less threatened by making an erroneous contribution or one that lacks relevance. A benevolent community is likely to encourage the participation and development of its members. Hence,

> *H_5: The greater the perceived benevolence in a community, the greater one's participation in knowledge-sharing.*

Conversely, a high degree of competence-based trust in relation to one's own competence is likely to generate de-motivational fears such as losing face and this would encourage the person to abstain from sharing their knowledge. Hence,

> *H_6: The greater the trust in the competence of one's community, the less one's participation in knowledge-sharing.*

4.4 Career advancement

Knowledge resides within individuals. Therefore, in order to effectively share knowledge, individuals must be motivated to do so. It has been argued that the provision of appropriate incentives will most likely influence the behaviour of employees in knowledge-sharing (Chung 2001: 9). Hall (2001b) views knowledge-sharing as a social exchange and argues that to "entice people to share their knowledge … actors need to be persuaded it is worth entering into a transaction in exchange for some kind of resource (p. 7).

These arguments raise the question of what constitutes an appropriate incentive. Indeed, there is much debate as to the most effective and appropriate incentive in motivating knowledge-sharing activities (Brown & Duguid 2000; Chung 2001).

Hall (2001b) suggests that knowledge-sharing could be included within 'good citizenship' where "[e]mployees who feel that they have been well supported by their organizations tend to reciprocate by performing better and engaging more readily in citizen behaviour" (Wayne *et al.* 1997: 90 in Hall, 2001b: 15). Hence, would a perceived high level of investment in employee development motivate members to engage in knowledge-sharing? Knowledge-sharing could be motivated by a sense of moral obligation. Indeed, recent studies of CoPs have suggested an association between moral obligation to the community and levels of knowledge-sharing (Ardichvili *et al.* 2002).

Extrinsic rewards such as financial incentives are another method of motivating knowledge-sharing (Hall 2001b). However, extrinsic rewards may provide only temporary compliance, rupturing relationships and reducing pro-social behaviour:

> *"Systems based on extrinsic rewards quickly turn moral obligation into acts of self-interest, and could potentially destroy the open provisioning of knowledge in a community"* (Wasko & Faraj 2000: 170).

Indeed, O'Dell and Grayson (1998) argue that "if the process of sharing and transfer is not inherently rewarding, celebrated, and supported by the culture, then artificial rewards won't have much effect" (p. 82). Herzberg (2003) found that financial rewards and other external factors are important in avoiding demotivation, but have little effect on sustaining the motivation of employees. Instead Herzberg discovered that factors that are intrinsically rewarding, such as the work itself, recognition and reputation, had a far greater influence on an employee's motivation.

Hall (2001a) argues that career advancement is an effective incentive in motivating knowledge-sharing. Although by definition an extrinsic reward, career advancement is closely related to the intrinsic motivators of recognition and reputation. Furthermore, it has been argued that employees may feel their job security is threatened by sharing the knowledge that represents their value to the company (Davenport & Klahr 1998). This may act as a demotivator. This leads to the proposition that a positive association between knowledge-sharing and career advancement is likely to motivate members to share their knowledge. Hence,

> *H_7: When knowledge-sharing is perceived to be closely linked to an individual's career advancement, knowledge-sharing will be higher.*

4.5 Sense of community

Sense of community (SoC) has been defined within a group as "a feeling that members have of belonging … that members matter to one another … and a shared faith that members' needs will be met through their commitment to be together" (McMillan & Chavis 1986: 9). SoC leads to a common perspective of knowledge as a public good, owned and maintained by the community (Wasko & Faraj 2000). Thus, knowledge-sharing is likely to be motivated by

moral obligation that results in a deeper sense of satisfaction than when motivated by extrinsic factors. A strong SoC will also lead to a greater degree of importance being placed on recognition of knowledge-sharing. This brings with it feelings of intrinsic satisfaction. Hence,

H_8: Where SoC is stronger, participation in knowledge-sharing will be greater.

4.6 Value congruence

A value has been defined as "an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence" (Rokeach 1973: 5). Our values affect our goals, attitudes, behaviour and are closely related to commitment (O'Reilly 1989).

Organisational values are defined as the values that management ascribe to and promote (Money & Graham 1999). Value congruency is the sharing of values between an individual and their organisation (Balazs 1990). A perception of value incongruence between an individual and their organisation can generate distrust (Fox 1974) and lead to lower levels of job satisfaction, job performance and organisational commitment (Balazs 1990).

Community members with little commitment to the organisation are likely to be less motivated to participate in KM initiatives. Conversely, high value congruence may manifest itself in higher commitment to KM initiatives. Hence,

H_9: The greater the perceived congruence an individual has with an organisation's values, the greater their participation in knowledge-sharing.

4.7 Research model

A theoretical model is developed and presented in Figure 1. This expresses and draws together the research propositions. Table 1 provides an operational definition for each of the constructs and provides the foundation for the empirical testing of the research model in a future study.

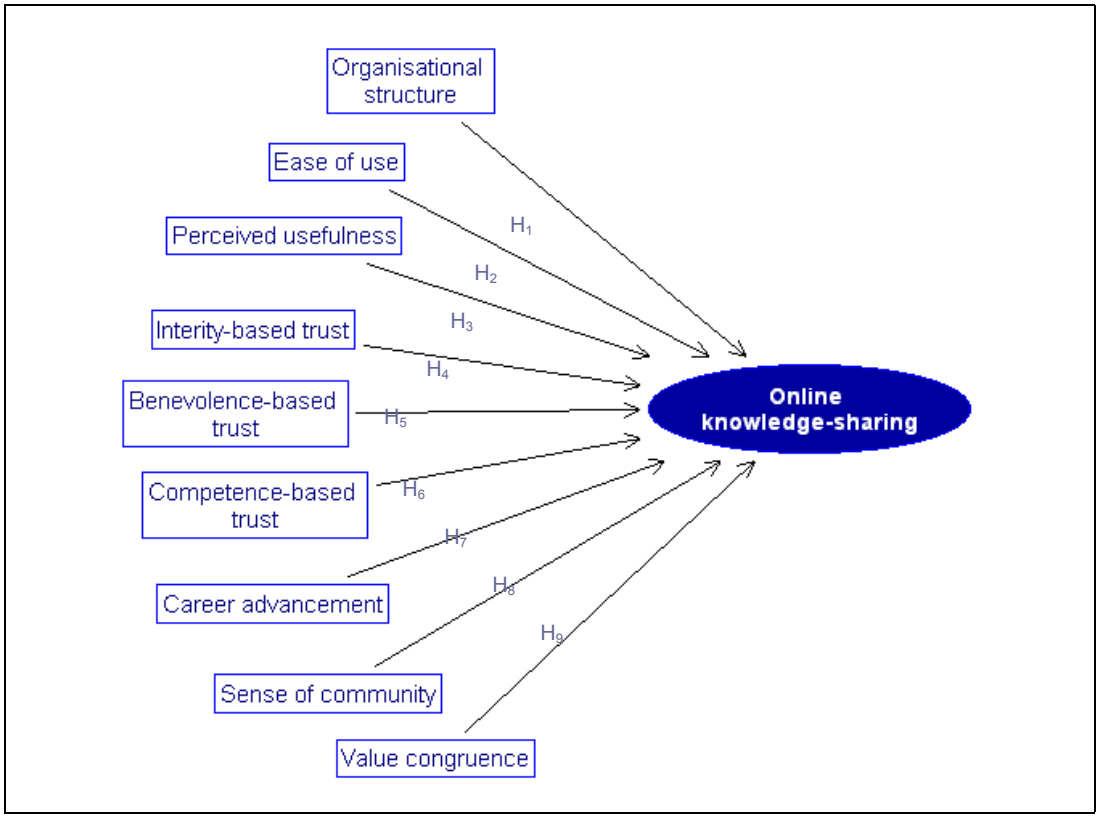

Figure 1: Research model

Table 1: Operational definitions

Concept	Component	Definition
Knowledge-sharing	Contribution	An instance of a response to an online request for assistance whereby a member contributes what they know.
Organisational Structure	Hierarchical Structure	The number of levels of authority in an organisation (Buchanan and Huczynski, 1997, p 304).
Information System	Ease of use	The degree to which a member believes that using the community discussion board is free from effort (Davis 1989).
	Perceived usefulness	The degree to which a member believes that using the community discussion board enhances their job performance (Davis 1989).
Trust	Integrity -based trust	The degree to which a member believes the community to be honest and reliable (Mayer *et al.* 1995).
	Benevolence-based trust	The degree to which a member believes the community will act in their best interest (Mayer *et al*, 1995).
	Competence - based trust	The degree to which a member believes that the community is knowledgeable and competent (Mayer *et al* 1995).
Recognition	Career Advancement	The degree to which a member believes sharing their knowledge will positively affect their career.
	Sense of community	The degree to which a member feels a sense of belonging in a community (Yoo *et al.* 2002).
	Value congruence	The degree to which a member's values are congruent with the organisation's.

5. Limitations of study

Adopting a narrow view of knowledge-sharing can simplify quantitative approaches such as hypothesis testing. However, this approach can attenuate some of the richness associated with a construct. For example, how would the factors discussed affect the sharing of other online knowledge-based resources such as documents, templates and presentations that typically reside within repository-based systems?

Knowledge-sharing could also prove difficult to measure, as knowledge is not easy to quantify. Knowledge-sharing involves a dyadic relationship between source and recipient. It is feasible and likely that these two actors would place differing values on a given instance of knowledge being shared. Furthermore, there is an inherent limitation and criticism of the applicability of the hypothetico-deductive method within social sciences research. Checkland (1989) in a plenary address to the OR (Operational Research) Society highlights the difference between research in the social and the traditional sciences:

> *"How different studying the chemistry of the reaction of nitrogen and hydrogen to yield ammonia would be if the molecules of nitrogen and hydrogen could decide capriciously whether or not to combine, doing so today but deciding not to next Thursday! But that is the situation the would-be social scientist is in"* (p. 38).

6. Conclusions and future research

In this paper we have discussed the importance of knowledge as an organisational resource and sustainable source of competitive advantage. We have explored the role of technology within KM and have identified the emergence of CoPs in KM as loci for the creation and sharing of knowledge. Having ascertained the importance of both information systems and social interaction in leveraging knowledge, we have highlighted the role of OLCs as an effective mechanism for extending the knowledge-related benefits of existing CoPs.

We have advocated through this paper that in order for organisations to fully leverage their knowledge-based assets, they must first understand the factors that affect knowledge-sharing at an individual level. A lack of clarity surrounding the term 'knowledge-sharing' has been identified and we have set forth an operational definition.

We have then presented the theoretical underpinning for the development of a number of hypotheses based on the relationship of nine factors to knowledge-sharing in OLCs. The factors identified include: organisational structure; the ease of use and perceived usefulness of the information system; trust based upon the benevolence, competence and integrity of the community; the perceived proximity of knowledge-sharing to career advancement; sense of community; and organisational value congruence. These factors are presented within a theoretical

model and the constructs have been operationally defined.

This paper provides the foundations for a subsequent phase of research. This will seek to identify and validate measures based on the operational definitions and empirically test the hypotheses underpinning the model. This research will continue the work of this paper in extending our understanding of the antecedents to knowledge-sharing within OLCs.

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