

Global Social Knowledge Management: The Future of Knowledge Management Across Borders?

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Abstract: Web 2.0 and Social Software revolutionize the knowledge exchange within and between organizations. This is one of the claims consultants and software vendors in the field have made. But have the promises been kept and has evidence been achieved so far, in particular for knowledge management in globally distributed settings?

As a starting point, our paper introduces the field of Global Social Knowledge Management (GSKM). We see this area as one of the main research area for future research in the Knowledge Management domain leading to changing practices in organizations. A variety of social software applications have already been seen promising and incorporated into the context of knowledge management (Avram 2006; Zheng and Zheng 2010; Levy 2009). Inter- and intra-organizational micro-blogs (Zhao & Rosson 2009), social networks (DiMicco et al, 2008) or organizational wikis (Levy 2009) are just some examples for potential applications. One main assumption is that social software could bridge the traditional gap between human- and technology orientation (Avram 2006; Fiedler & Welppe 2011). However, there is so far only anecdotal evidence how these applications work in complex, globally distributed organizational settings. We see some initial indications that the field is very promising but it is highly necessary to perform more coordinated research. Within this paper, we present the key issues for GSKM. One of the most important issue is the choice of tools according to goals and processes. To support an adequate choice, we provide a mapping between Social Software, key barriers and knowledge activities.

The main research domains related to GSKM are Social Software and Global Knowledge Management. We present a brief review of state of the art research for these domains and focus in detail on Social Software supported knowledge activities. We elaborate on the key barriers for GSKM that affect the usage and adoption of Social Software in KM activities. As one of the first efforts of mapping Social Software to KM, we present a Social Software framework, mapping the major barriers to tools and KM activities. We see this mapping as a crucial step towards finding the right tools for organizations' purposes. With this framework, we emphasize the need to analyze the implications of the global (cultural) influences to the existing and emerging Social Software-supported knowledge activities and processes.

The paper is a starting point for discourse on this promising field, outlining the research field of globally distributed Social Software-supported Knowledge Management and discussing current research efforts on the main components. By this paper we intend to contribute towards a research agenda for Global Social Knowledge Management.

Keywords: Global Social Knowledge Management, Social Software, Knowledge Management, Distributed teamwork, Internationalization, Cultural influence

1. Global Social Knowledge Management: State of the Art

Managing knowledge in a global environment can be problematic. The potentials and challenges Social Software poses are not fully understood in leveraging knowledge between individuals and organizations. Here we lay our conceptual foundation for the study and describe the key components of Global Knowledge Management and Social Software (Figure 1).

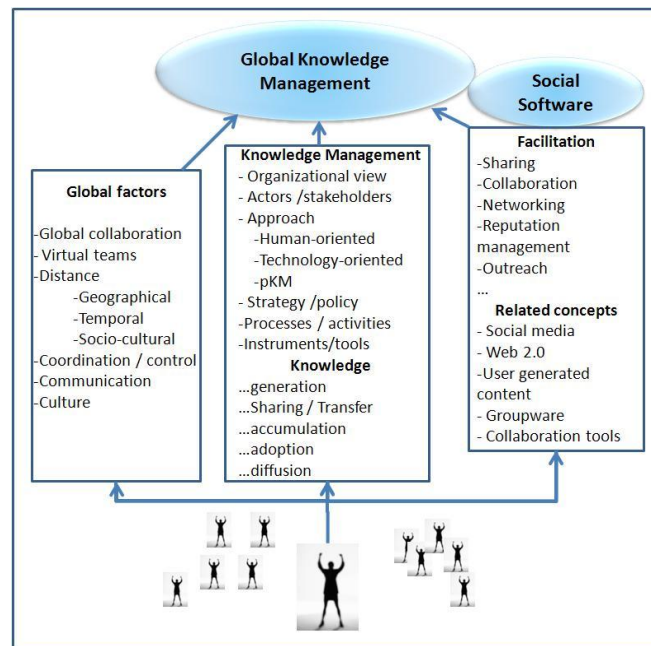


Figure 1: Main focus points for GSKM

As a starting point, we define Global Social Knowledge Management as *the research discipline on strategies, management and processes utilizing social software systems and tools to enhance knowledge management in globally distributed settings*. The main idea is to bridge the gap of human- and technology orientation as well as facilitating inter- and intra-organizational knowledge processes.

1.1 Global Knowledge Management

Global Knowledge Management contains processes, systems, and stakeholders for Knowledge Management in globally distributed settings. Thus, GKM is the main concept for cross cultural knowledge exchange and collaboration amongst people and organizations. Working within global contexts, raises challenges that need to be understood and addressed (Nunamaker et al, 2009). In previous research, we have observed barriers that have been studied for virtual teams and distributed collaboration to lay a foundation to understand the global aspect of our analysis. Within the IS literature, a virtual team has been defined as a geographically distributed group of people who work closely together using multiple technologies as their primary interaction (Sivunen and Valo 2006). Virtual teams are often related as a part of global software development and outsourcing of organizations' activities abroad (Huang and Trauth 2007). Conquering the challenges of virtual teams remains to be one of the most crucial research topics (Huang and Trauth 2007; Sivunen and Valo 2006). These challenges include time zone differences, cultural differences, different working styles as well as loss of communication richness (Nunamaker et al, 2009).

Studying collaboration and global team aspects within the research domain can help us to achieve a good comprehension of underlying challenges caused by distributed work settings and bring us closer to overcome the challenges.

From a Knowledge Management perspective, several approaches for managing knowledge in organizations have been proposed in the recent years. Some of the approaches present more human-driven approach, some focus more on technological support (Choi & Lee 2002). Knowledge sharing has been raised as a crucial, but not yet fully understood factor in Global Software Development (GSD) projects and teamwork (Storck 2000; Thomas and Bostrom 2010). Knowledge Management in an organization could be defined to comprise of the phases of knowledge generation, transfer, accumulation, adoption, and diffusion (Disterer 2001). There are also many similar KM life cycle models as presented by Nissen et al (2000). A significant part of the KM literature is about knowledge sharing/transfer which has been continuously raised as the cornerstone of KM strategy of (globally acting) organizations (Disterer 2001; Bureš 2003; Riege 2005).

Through the Knowledge Management component we can achieve more specific view on the organizational as well as individual challenges arising in collaborative distributed settings. These include situations where knowledge is being created, shared and adopted by groups of people.

1.2 Social Software

As previously argued, Social Software has been recently applied in various organizations as a tool for managing knowledge and collaboration but the barriers for adoption have been evident (Kärkkäinen et al, 2010; Zheng et al, 2010). As indicated by Kärkkäinen et al (2010), studies on the adoption of these technologies in organizations and specific business functions is currently limited while the changes towards utilizing Social Software are very fast especially when adopting for business purposes. Thus, not all challenges are understood neither the solutions. Challenges for Social Software have been identified for different settings: managing knowledge in business to business sector (Kärkkäinen et al, 2010), supporting knowledge evolution, use and sharing (Zheng et al, 2010), managing reputation in academia (Matešić et al, 2010) or sharing knowledge in schools by teachers and students (Agarwal et al, 2007).

Even as the term Social Software is frequently used, there is still no commonly agreed definition. One way of describing Social Software is that it enables interactive collaboration, managing content and networking with others. It supports the desire of users to be pulled into groups in order to achieve their personal goals (Wever et al, 2007). From this description, we can say that Social Software denotes *applications that involve various collaborators in social interaction where new meanings, contents or discussions are created.*

As a conclusion, we see Global Social Knowledge Management as a promising field for future research. However, various unexplored areas remain. It is not clear which Social Software tools (and corresponding processes and activities) can support globally distributed knowledge management. As pointed out by Fiedler and Welpé (2011), it is crucial to look further and study how Social Software could be taken up successfully in specific KM processes and activities of global organizations. To understand the usefulness and utility of GSKM better, we analyze as the first how Social Software tools can support different purposes and KM activities.

2. Global Social Knowledge Management: Finding Social Software for KM barriers and activities

As shown above, it is crucial to clearly understand which tools and applications can support KM in global settings. We follow a simple approach of KM architectures for this purpose looking at the key components of global KM settings: we start with challenges and problems which might keep actors away from engaging actively in KM activities. Secondly, we identify core KM activities. As the main outcome, we map Social Software tools: identifying tools supporting versatile KM activities and mapping these to major challenges. This is a crucial task towards overcoming barriers, especially in globally distributed, culturally diverse settings. From this, we derive the following research questions:

1. Which are the main Social Software categories in the current literature and which are the key functionalities for these tools?
2. To which type of knowledge activities these tools apply and which are the main GSKM barriers in these settings?

Based on these key questions, we have chosen the methodology: we base our approach on the Global Knowledge Management Framework (GKMF, Pawlowski & Bick 2012) which identifies the key components of global KM settings and their interrelations. Based on this initial framework, we have performed a literature analysis with a systematic approach (Fink 2005) aiming at identifying relations between barriers, activities and tools (interventions). Secondly, we perform a design-oriented, constructive approach (Dodig-Crnkovic 2010) to build a framework in order to provide guidance for Social Software interventions aiming at 1) identifying and overcoming major barriers, and 2) identifying and supporting knowledge activities with a global and culture-aware focus.

Same as in the research for constructive and design-oriented approaches, research on our components of investigation (GKM and Social Software) typically initiates from a problem perspective. As a starting point, it is essential to recognize and understand barriers to GSKM.

2.1 Barriers in GSKM research

In many publications, barriers are discussed from the viewpoint of an individual or group of people, like university students (Sclater et al, 2001) or company employees working in virtual teams (Noll et al, 2010). Barriers can relate to social interaction and as an example to factors that hinder or challenge knowledge exchange (Disterer 2001). They also might relate to challenges and risks when adopting or using a specific technology (Baltatzis et al, 2008). Existing studies also diagnosed challenges set by diverse workers, hierarchies and cultural influences within an organization (De Long and Fahey 2000). Barriers are also in many cases tied to a specific context. This can relate to a specific technical platform (Sclater et al, 2001) or more loosely defined context, like collaboration of employees in global software development projects (Noll et al, 2010). Based on the previous characteristics of barriers in IS literature, we define a barrier as any challenge, risk, difficulty, obstacle, restriction or hindrance that might prevent a single person, a group or an organization to reach an objective and success in a specific context when the challenge is related to acting or working in a collaborative cross border setting.

A comprehensive literature review was conducted for GSKM barriers to identify the major barrier categories and show the interdependencies between the research domains (global KM and Social Software) (see Pirkkalainen & Pawlowski 2012). The key categories are the following:

Table 1: Barrier categories (Pirkkalainen & Pawlowski 2012)

Category	Dimension					
	Context	Social	Technical	Quality	Legal	Culture
	Organizational Geographical /temporal Contractual	Relational Skills Cognitive / personal	Availability Interoperability Functionality Usability / quality Privacy / security	Content / Information	Ownership	National / context Organizational

A key challenge for GSKM settings is to manage / understand cultural influences in interpersonal knowledge sharing efforts. As barriers in Knowledge Management clearly focus on interpersonal and technological barriers, the roles of cultural and language distance as well as temporal and geographical issues have been overlooked. The role of culture has been highlighted as the most crucial for KM and Global IS barriers (Pirkkalainen & Pawlowski 2012). As shown within their analysis, these challenges are persistent in nature and require careful and sustainable attention. We recognize this crucial matter and emphasize it further in the next chapter where we show a mapping between Social Software, KM activities and barriers.

2.2 Mapping barriers to knowledge processes and Social Software

One of the key issues of Social Software for KM is to understand in which context these tools are useful. In the following, we present a framework for Social Software which aims to support 1) overcoming certain barriers and 2) to identify corresponding KM processes. By this systematic mapping, we provide a first step and a basis for a clear and well justified tool selection process for organizations.

We recognize the fact that Social Software in general has potentials for supporting various tasks such as knowledge identification and sharing as well as collaboration in globally acting organizations (Onyechi & Abeysinghe 2009; Zheng & Zheng 2010; Fiedler & Welpé 2011). However, it is crucial to be more specific how these versatile tools actually fit the differing KM activities and which are the barriers emerging in these settings. Table 2 presents how some of these crucial interrelations between Social Software, KM processes and barriers could occur.

The Social Software tool categories and purpose were derived from the 4C classification of Cook (2008), taking into consideration collaboration technologies from the extended Groupware classification by Borghoff & Schlichter (2000) which are referenced under Social Software literature and finally enriching the merged categories by "Social Software in KM" literature. The key end user functionalities were extracted from three most popular services per category, which we identified by using eBizMBA and Alexa Global Traffic Ranking of services and websites. The barriers and activities are derived from the main KM and Social Software literature and present some of the main findings for both. Especially for barriers, however, many other types of challenges can be identified (see Pirkkalainen & Pawlowski 2012).

Table 2: Social Software framework; mapping the tools to KM activities and major barriers

Tool category	Purpose	Key End user Functionality	KM Activities & processes	Main Barriers
Blogging tools	Communication	<ul style="list-style-type: none"> -Post writings -Comment on writings -Share writing (external/internal) -Evaluate writings -Extend with plugins / integrate to other systems -RSS (alerts) 	<ul style="list-style-type: none"> -Active & passive exchange of professional information (Fiedler & Welpel 2011). -Acquire / capture / create, Apply/share/transfer. Incentive for (Reuse/innovate/evolve/transform), alerting (Avram 2006) -Knowledge Evolution (Zheng & Zheng 2010) -Idea-generation and problem-solving (Zhang 2010) -Externalization, combination (Chatti et al, 2007) -Creation, codification, sharing, collaboration, organization (Razmerita 2009) 	<p><i>Organizational, Cultural, Social</i></p> <p>Organizational (Zhang 2010), Fitness to task (Thom-Santelli 2010) Cognitive (Kim 2008)</p>
Micro-blogging tools	Connection / awareness.	<ul style="list-style-type: none"> -Post micro writings -Comment / share / evaluate micro writings -Share material / Information via micro writings -Manage profile (notifications (RSS), privacy) -Follow other users -Send direct messages 	<ul style="list-style-type: none"> -Retrieve knowledge for use (Zheng & Zheng 2010), -Enhancing information sharing (easy to identify information updates), building common ground, sustaining connectedness among colleagues, supporting informal communication (Zhao & Rosson 2009) -Alerting, informing users of changes (Levy 2009; Avram 2006) -Socialization, combination (Chatti et al, 2007) 	<p><i>Organizational, Social</i></p> <p>Fitness to task (Thom-Santelli 2010), Social (trust) (Zhao & Rosson 2009)</p>
Social networking tools	Awareness, communication, sharing, (collaboration), (identification)	<ul style="list-style-type: none"> -Add / delete friends / groups / events -Post short writings to f/g/e -Share material / information with f/g/e -Manage profile (notifications (RSS), privacy) -Send direct messages -Instant messaging (p2p/group) -Extend with plugins / integrate to other systems 	<ul style="list-style-type: none"> -Building personal networks leading to creation of organizational memory (Fiedler & Welpel 2011) -Scan/Map, Acquire/capture/create, store, Apply/share/transfer, alert (Avram 2006) -Social presence in Knowledge sharing, expert finding (Zheng & Zheng 2010) -Socialization, combination (Chatti et al, 2007) 	<p><i>Organizational, Social, Cultural</i></p> <p>Fitness to task (Thom-Santelli 2010), Social (Cloete et al, 2009), (Dimicco et al, 2008) Communication (Thom-Santelli 2010) Cultural (Cloete et al, 2009)</p>
Social bookmarking tools	Identification, collaboration, sharing	<ul style="list-style-type: none"> -Save links / bookmarks for personal/ community use / sharing (social tagging) -Comment on pages / bookmarks / links -Include saving options for browser or to mobile device -Follow users activities -Include feeds (RSS) / notifications 	<ul style="list-style-type: none"> -Scan/Map, Acquire/capture/create (Avram 2006), -Collaborative building of a knowledge structure (Cayzer 2004) -Alerting, informing users of changes (Levy 2009; Avram 2006) -Combination (Chatti et al, 2007) -Sharing, collaboration, organization (Razmerita 2009) 	<p><i>Organizational, Social</i></p> <p>Conceptual / fitness to task / knowledge sharing (why to use, what are the benefits) (Millen et al, 2006)</p>

Tool category	Purpose	Key End user Functionality	KM Activities & processes	Main Barriers
Wiki	Collaboration, sharing, identification, communication.	-Collaborative page writing / editing -Cross-linking pages/ concepts/ information -Managing page versioning -Commenting on pages -Notifications (RSS) -Wide extension and integration possibilities	-Active & passive exchange of professional information (Fiedler & Welpel 2011) -Scan/Map, Package / codification / representation, Apply / share / transfer, Reuse / innovate / evolve / transform, alert (Avram 2006) -Idea-generation and problem-solving (Zhang 2010) -Externalization, combination (Chatti et al, 2007) -Creation, codification, sharing, collaboration, organization (Razmerita 2009)	<i>Technical, Social</i> Social (Cowan et al, 2009), Cognitive (Cowan et al, 2009), Skills, Usability (Kear et al, 2010 ; Cowan et al, 2009)
Synchronous / Collaborative writing	Collaboration	-Collaborative document / presentation writing / editing -Managing page versioning -Instant messaging between authors	-Acquire / capture / create, store (Avram 2006)	<i>Technical</i> Skills, usability (Brodahl et al, 2011)
Instant messaging and chat tools	Communication	- Add / delete contacts -Send private / group messages -Add awareness information (short status updates, availability) -Video calls	-Building personal networks leading to creation of organizational memory (Fiedler & Welpel 2011) -Knowledge sharing for quick questions and clarifications (Quan-Haase et al, 2005) -Externalization (Chatti et al, 2007) -Creation, sharing (Razmerita 2009)	<i>Organizational, Social, Cultural</i> Creates distance (used for difficult decisions or sensitive topics) (Quan-Haase et al, 2005)
time management	Collaboration, awareness	-Create and share calendars -Organize meetings/events -Make to-do lists -Polling, voting, survey	-Scan/Map (Avram 2006) -Awareness activities (Munkvold 2003) -Codification, organization (Razmerita 2009)	<i>Organizational, Social</i> Support for organization or individual? (Munkvold 2003)
Shared information spaces /media sharing (video, audio, images, presentations)	Identification, collaboration, communication sharing	-Share information (P2P, group, community) -Comment on information -Follow users -Notifications (RSS)	-Scan/Map, Acquire/capture/create (Avram 2006) -Knowledge sharing (Bafoutsou & Mentzas 2002) -Storage/retrieval (Alavi & Leidner 2001) -Combination (Chatti et al, 2007) -Codification, sharing, organization (Razmerita 2009)	<i>Organizational, Social, Cultural, Technical</i> Privacy, security, misuse, administration effort, Unwillingness to share (judged by others) (Kietzmann et al, 2011)
Conferencing	Communication	-Organize small to big group calls -Webinar / webcast / conference -Whiteboarding -Screensharing -Document sharing -Record / share session	-Human presence- and overview of activities in distributed tasks (Bafoutsou & Mentzas 2002) -Early stages of teambuilding (Munkvold 2003) -Externalization (Chatti et al, 2007)	<i>Social</i> Knowledge sharing (Munkvold 2003)

Tool category	Purpose	Key End user Functionality	KM Activities & processes	Main Barriers
Brainstorming tools (separate or in a GDSS)	Collaboration	-Idea structuring -Whiteboarding -Mind mapping -Voting / ranking	-Activities that are similar to take normally place in business meetings, decision support (Bafoutsou & Mentzas 2002) -Combination (Chatti et al, 2007)	<i>Social, organizational, cultural</i> Evaluation apprehension, free riding, cognitive inertia (Shih et al, 2009)
Discussion Board / Forum	Communication	-Create threads / discussions With peers / groups / communities -Create / browse profiles -Comment on threads / discussions -Assign notifications	-Forming knowledge networks (those who seek information and those who can provide it), knowledge identification/ creation/ sharing (Alavi & Leidner 2001; Razmerita 2009) -Combination (Chatti et al, 2007)	<i>Organizational, Social</i> Fitness to task (Bafoutsou & Mentzas 2002)

The table above presents some of the researched aspects around barriers on different tools and the application of these technologies in knowledge activities and processes. The highlighted barriers indicate some of the strongest challenges when applying the tools in the KM activities. Overcoming these challenges is crucial for a successful usage. The key barrier for applying these Social Software tools in the globally distributed organizational activities is the social dimension which in many cases leads to unwillingness to share or only some people of the key stakeholders contributing. As indicated by several authors, the cultural influence to personal or organizational behaviour is crucial. This has been raised as the top challenge for globally distributed work as for KM (Pirkkalainen & Pawlowski 2012). However, as depicted by Dafoulas & Macaulay (2001), modelling and building variables from cultural factors (especially national), is extremely difficult and risky. We share the view that it is more essential to understand the effects of culture on working settings. We realize the fact that several authors imply, Social Software provides mechanisms for KM and social collaboration and strives for the lowest effort in adoption and use, but, as indicated by Riege (2005), knowledge sharing embracing organizational cultures requires mechanisms around the technology itself for succeeding. This is why we see this mapping of tools to barriers and activities as a crucial phase for finding out, how those activities could be designed and prepared to embrace and support the open, transparent and collaborative globally distributed knowledge management processes.

It is not a surprise that most Social Software have been stated to support knowledge exchange in particular. What can be identified from the table is the fact that Social Software is widely being used for purposes beyond this. In fact all the basic phases of knowledge life cycle are covered by Social Software while the focus points for specific tools can be identified from the framework. In Figure 2, based on the previous framework, we highlight to which knowledge activities Social Software has been mapped in existing literature. We have adapted the life cycle model of Nissen et al (2000), including a further step of "identifying" knowledge which has been raised as a crucial step in Social Software literature.

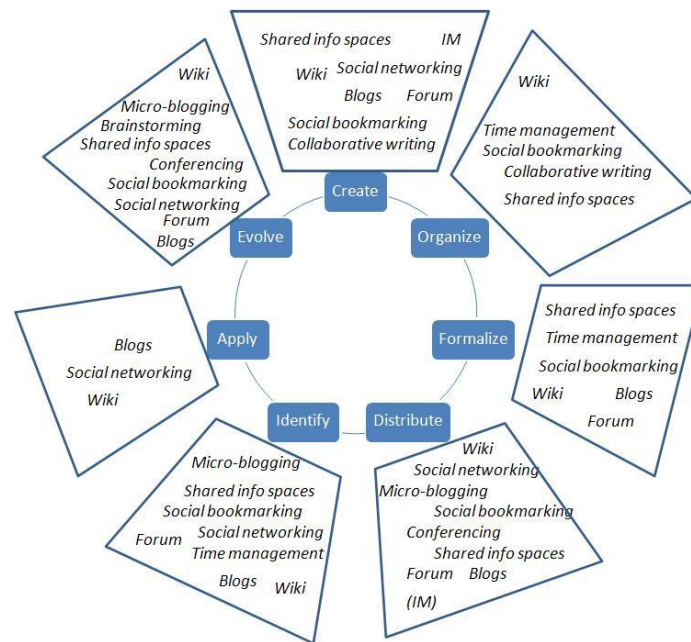


Figure 2: Social Software in a knowledge management life cycle

Our approach provides a first step towards mapping the key components of Global Social Knowledge Management (GSKM); barriers (also representing global and cultural challenges and issues), activities and Social Software tools. Our initial mapping is just an exemplary mapping, it is not – and does not intend to be – complete. However, it is a first step to develop a clear understanding and guidance of how Social Software tools can be utilized in a promising, successful way. As indicated by Avram (2006) and many other researchers, knowledge evolves through collaboration and conversations when applying Social Software in knowledge management. This has obvious impacts how knowledge flows and cycles should be represented. Therefore, Figure 2 should be taken only as a visual representation and a mental image to understand the connection while the actual knowledge steps are much more intertwined and unordered.

3. Conclusion and Outlook

Within this paper, we have provided a starting focus for Global Social Knowledge Management research. We provided a short survey of successful approaches and for the first time in globally focused KM research, we have mapped Social Software to knowledge activities and major barriers based on the existing literature. This exemplary mapping effort provides a first glance to recognize the crucial influence the global or multicultural component brings to managing globally distributed knowledge activities through Social Software support. We argue that it is necessary to recognize the huge role these culturally sensitive barriers have in globally distributed organizations and teams. These barriers represent the different working behaviour and differing values and beliefs the members of the organization possess. The framework constructed for this paper can be seen as starting points for organizations to recognize how Social Software interventions can be managed in versatile KM processes. This becomes highly important taking in to consideration that most KM initiatives are struggling to succeed.

More research is needed in this intriguing and widely relevant topic. It is necessary to investigate further how globally distributed KM affects the basic knowledge processes and how the role of the major barriers shifts from one context to another. Additionally, what is yet missing in the literature are concrete decision support approaches for Social Software in KM settings.

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