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Knowledge management: The missing link in DMO crisis management?

Abstract

Despite some recognition of the role of DMOs in crisis management, limited attention has focused on the role of Destination Marketing Organisations (DMOs) in crisis events, and in particular their role in managing knowledge across diverse stakeholder groups and domains. This theoretical paper attempts to address this deficiency by synthesising knowledge management and tourism crisis management literature, to outline the potential role of DMOs in managing knowledge across boundaries during crises. Carlile's (2004) work on boundary spanning is used to consider potential organisational and management issues for DMOs dealing with crisis events and how they should be managed. The paper argues that because of the role and nature of DMOs they should play an important role as knowledge spanners/brokers to transfer, translate and transform knowledge to stakeholders. The paper concludes with future research avenues related to knowledge management, DMOs and crises.

Keywords: boundary spanning; knowledge management; crisis; tourism; DMO

Introduction and background context

Shaw and Williams (2009) recognise the important role of knowledge management, knowledge transfer and innovation as emerging issues in the tourism research agenda, while a recent special issue of this journal also suggests the importance of the link between knowledge management and tourism (volume 11, number 5 2008). Ritchie (2008) notes an increasing number of disasters and crises which affect the tourism industry. In recent years the global tourism industry has experienced many crises and disasters including terrorist attacks, political instability, economic recession, biosecurity threats and natural disasters. This situation is likely to increase as broader security issues including global environmental change and resource security, health, and economic security are likely to increase (Gössling & Hall, 2006). Increased recognition of this issue has led to more recent tourism crisis management research (see for instance Evans & Elphick, 2005; Fall & Massey, 2005; Frisby, 2002; Hooper, 2002; Pine & McKercher, 2004; Ritchie, 2009; Stafford et al., 2002). Despite some recognition of the role of Destination Marketing Organisations (DMOs) in crisis management (Ritchie & Crouch, 2003) limited attention has focused on their role in crisis events, and in particular in managing knowledge across diverse stakeholder groups (including industry sectors, emergency services and government agencies). This theoretical paper attempts to address this deficiency by synthesising knowledge management and tourism crisis management literature, to outline the potential roles of DMOs in generating and managing knowledge across boundaries during crises and disasters.

This paper begins by outlining knowledge management, tourism knowledge management and considers the role of DMOs in crisis knowledge management. The paper then discusses the role and importance of knowledge brokers and spanners in developing and sharing such knowledge across diverse groups and domains (such as that encountered in the tourism industry). DMOs may play an important role in acting as knowledge spanners/brokers in facilitating tourism crisis and disaster knowledge management through the use of boundary objects such as repositories, forms, models and maps. This helps to transfer, translate and transform knowledge to stakeholders involved in planning and managing tourism crises and disasters. The paper concludes that DMOs should play a pivotal role in knowledge management during crises and makes recommendations for future research.

Knowledge management and tourism knowledge management

Like tourism management, the discipline of knowledge management is relatively young and involves the integration of several disciplines including computer and management science, sociology, human resource management and strategy. The definitions of knowledge management vary, depending on the perspective and approach of authors. According to Malhotra (1997, p. np):

[k]nowledge management caters to the critical issues of organisational adaptation, survival and competence in the increasingly discontinuous environmental change...essentially, it embodies organisational processes that seek synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of human beings.

This definition describes how knowledge management combines technological and human elements, bringing them together so that they can enable the organisation to adapt to change.

McElroy (2000, p. 199), however, stresses that changes have already been taking place so that there is now much more emphasis on the human dimension:

Among the changes now taking place in the practice of KM [Knowledge Management] is a shift in thinking from strategies that stress dissemination and imitation to those that promote education and innovation. To date, the goal of KM has been to capture, codify and distribute organizational knowledge (usually in centrally managed computer systems) so that it can be shared by an organization's knowledge workers in the field. By contrast, the educate and innovate strategy, while placing no less importance on sharing and informed decision making, grants a higher value to learning and knowledge creation.

It is important to note that knowledge management is not just required for individual organisations. As Schianetz et al. (2007) acknowledge approaches are needed that promote stakeholder collaboration and learning at a destination or regional level, as well as an organisational level. The authors note that this is increasingly important due to the dynamic of the tourism system and for long-term sustainability. In particular, Schianetz et al. (2007:1486) note that a learning organisation approach to destination management would help create a shared understanding for adaptation to a changing environment, promote a collective awareness of eventual economic, social and environmental risks and impacts as well as how risks can be minimized and/or counted.

Knowledge management is increasingly recognised as an important tool that can augment the chances of adaptation and survival of organisations (Bahra, 2001; Cooper, 2006; Malhotra, 2002; Mistilis & Sheldon, 2006; Newell *et al.*, 2002;), and is an important part of identifying, recording and sharing disaster lessons (Robert & Lajtha, 2002). Although in much of the literature the emphasis is upon the creation of organisations developing competitive advantage (Davidson & Voss, 2002; Grant, 1996) knowledge management is also recognised more broadly as important for a range of tourism organisations (Bouncken & Pyo, 2002; Cooper, 2006; Shaw and Williams, 2009). Knowledge can be identified as a series of stocks - what is known, and flows - how it is communicated (Cooper, 2006; Davidson & Voss, 2002), and can be crucial for the effectiveness of quick reactions to any crisis. Nevertheless, knowledge management is often focused on simply storing knowledge and innovation, rather than developing supporting processes to enable new knowledge creation, recognition and utilization (Earl, 2001). Knowledge acquisition and storage is only one part of the process with information distribution, interpretation and organisational memory other important parts.

Knowledge can take two main forms - explicit and tacit knowledge. Explicit knowledge can be made explicit through articulation and communication with others, whereas tacit knowledge represents knowledge that cannot be clearly articulated to others, and may include personal beliefs, thoughts and perspectives that are hard to communicate. The transfer of tacit knowledge requires commitment and involvement in a specific context (Nonaka & Takeuchi, 1995). As Shaw and Williams (2009) suggest, tacit knowledge is important with respect to tourism competitiveness.

The first stage in any knowledge management strategy is to identify who has important knowledge and what format it takes. Here it is important to recognise the difference between

information and knowledge (Blackman, 2006; Fahey & Prusak, 1998), since simply to move more information around the system will not be sufficient to improve available knowledge. In many cases tacit knowledge held by individuals should be shared within, and perhaps even outside of, the specific organisation. Often the argument is made that tacit knowledge needs to be made explicit (Nonaka & Takeuchi, 1995), but this is frequently not realistic to achieve, especially in short time frames. Consequently, Blackman and Ritchie (2007) argue that for successful crisis management, knowledge management approaches focused upon the creation and movement of knowledge will be more effective. In this context the role of knowledge brokers or spanners (such as industry associations and DMOs) become particularly important, which is discussed in subsequent section of this paper.

Crises, DMOs and knowledge management

In late 2008, terrorist attacks in Mumbai, political action that closed airports in Thailand and the global financial crisis provided vivid examples of the increasing number of disasters and crises affecting the tourism industry in general, and Destination Marketing Organisations (DMOs) in particular. In future years, it is anticipated that natural disasters will occur with increasing frequency and severity in the face of climate change (Flannery, 2005). It is not a fact of whether a destination will encounter a crisis or disaster but when it will occur (Ritchie, 2008). However, in our tightly connected world, these events resonate across borders to impact sharply and unexpectedly on organisations, industries and states.

As DMOs are primarily marketing organizations their main roles in a crisis or disaster are often concerned with crisis communication and the development and implementation of crisis recovery marketing strategies (Ritchie & Blackman, 2007). However, other authors have noted the expansion of DMO roles to include broader destination management functions including industry development, product development, coordination and research (Pike, 2004; Ritchie and Crouch, 2003). As Page et al. (2006, p. 361) note with regards to DMOs and tourism shocks, they have a remit ‘...to undertake a leadership role to understand, analyse, plan and manage crises and disasters’. Therefore, the role of the DMO can include industry education and preparation for crisis events, assisting the industry with coping with any negative effects of crises (through providing or lobbying for industry assistance packages). DMOs may even be in a position to assist with the planning or development of new experiences or infrastructure as a result of particular crises. For instance, Armstrong (2009) noted the involvement of the local DMO in the planning and development of new tourism precincts and products after the 2003 bushfires in Canberra, Australia.

Collaboration is required between different organisations, government departments, emergency personnel, media organisations, and other stakeholders in responding to a crisis or disaster. Although it is often the responsibility of other stakeholders (such as government agencies or emergency services) to directly respond to crisis or disaster events, the tourism industry and DMOs play a significant role in the longer term recovery of a destination (Paraskevas & Arendell, 2007; Hystad & Keller, 2008), as well as an important coordinating role between industry associations, industry stakeholders and the central government (Ritchie, 2009). Control over communication and the messages on the nature, impacts and outcomes of a crisis or disaster are vital, and are often coordinated by DMOs. The media can encourage the flow and the intensity of a crisis or disaster or even help turn an incident or issue into a crisis due to negative media coverage. In some instances it is the prolonged or continual coverage of crisis events that

influence consumer confidence in a destination (Beirman, 2003). Subsequently, DMOs need to work with the media to ensure that a consistent and accurate message is transmitted to the various publics and stakeholders. Therefore, crisis communication and public relations is essential in restoring confidence in a tourism destination impacted by a crisis or disaster, and should be then followed or supplemented by recovery marketing initiatives to increase visitation to the destination (Beirman, 2003; Armstrong & Ritchie, 2007). This includes working with internal stakeholders (staff), and external stakeholders including governments, tourism industry members, tourists or potential tourists, the media and other DMOs. Such multifaceted activities and heterogeneous actors require careful attention to the management arrangements within which knowledge is created, accessed, developed, shared and institutionalised.

New forms of knowledge and new perspectives on tourism opportunities must be developed by DMOs if they are to fulfill their roles as the arbiters of destination promotion in this context. Consequently, increased recognition of disaster management approaches, responses, recoveries and organisational continuities (Lee & Harrald, 1999; Ritchie, 2008) as a result of the seeming ubiquity of crises, has led to a strengthening of research in the field. However, Ritchie (2008) argues that there is still too reactive a response to tourism crises and calls for more research to enable better crisis preparedness because, although the role of DMOs in keeping ahead of the dynamic and heterogeneous tourism market (Gretzel et al., 2006; Pike, 2004) is well recognised, the rate of change in the context of disaster focuses attention even more closely on the critical need for innovative action in the sector, a focus which is yet to be fully explored through empirical work.

Alongside this accelerated interest in tourism crisis management, a preoccupation in organisational research is evolving concerning the value of knowledge to organisational effectiveness. It is now well accepted that organisations whose people have superior knowledge and are able to harness that knowledge, will be able to act faster and more effectively than those without (De Geus, 1997; Teece et al., 1997). As a consequence, the ways in which knowledge is created, developed, shared, utilised and institutionalised is an increasingly focal point in organisational theorising and practice. Governance is the process of deciding how an organisation should be determined in terms of its structures for management (Schwarzkopf et al., 2008) and consequently, in situations where rapid response and innovation is crucial, such as in tourism crisis management, effective management supporting appropriate knowledge activities will be vital. For DMOs, the knowledge required for effective planned response to crisis may well exist within and between the stakeholder groups, however the ability of these groups to access and utilize that knowledge may be a limiting factor (Ruhanen, 2008) which can be ameliorated through careful attention to governance structures and processes.

In DMOs, as in many contemporary organisations, knowledge activities are often directed at supporting the storage of knowledge and innovations for use by others; rarely is activity directed at developing the supporting processes that enable new knowledge creation, recognition and utilisation, thereby adding value to crisis response and management. Whilst several authors note the capacity of crises or disasters to act as turning points for destinations and businesses (Burnett, 1998; Faulkner, 2001), these 'transformational connotations' or positive potentialities are exploited only when new knowledge is acquired or applied in novel ways, so that stakeholders are enabled to change their perceptions of the situation and future outcomes. In its simplest terms, a knowledge management system is a way whereby knowledge can be recognised and used in a

planned, ongoing manner (Ruhanen, 2008). As Mistilis and Sheldon (2006, p. 42) state, 'at the destination level a shared knowledge system is needed to address crisis and disasters with all tourism stakeholders involved in its creation,' suggesting the important role of knowledge management in managing crises and disasters.

Given the 'stickiness' of knowledge (Von Hippel, 1994), its elusiveness, complexity and resistance to definition (Tsoukas & Vladimirou, 2001), it is unsurprising that a broad range of organisational knowledge theories and management approaches have emerged in recent years (Baets, 2005; Choo & Bontis, 2002; Dimitriadis, 2005). Nevertheless, however difficult it is to define, capture or manage, the desired outcome for organisations is to bring about changed understandings in their employees, as individuals, collectively and as organisational units. Without changed understanding, there cannot be any alteration to the ways in which entities perceive and interact with the world (Blackman & Henderson, 2005) and, therefore, innovation cannot occur.

Although the intention seems simple, the actual ability to alter understanding is often disappointing (Malhotra, 2002; Storey & Barnett, 2000). Whilst there is no consensus on the reasons why knowledge management strategies so frequently fail, Carlile (2004) builds an argument which places responsibility with the increasingly complex circumstances possible at a boundary and the lack of appropriate knowledge manipulation activities available to negotiate across boundaries. That is, individuals' and groups' inability to connect their different worlds across personal and institutional boundaries prevents the combination of the different areas of knowledge, which would lead to the requisite novelty so desirable for individual and organisational innovation. Star and Griesemer (1989) describe the tension that emerges in the divergent viewpoints amongst groups of different actors who are required to cooperate for organizational outcomes. They posit that the development of *boundary objects* which can be made sense of in agents' intersecting social worlds and which meet their information needs are critical to this 'connection', which is discussed later in this paper.

In the current context of increasing complexity and change in the tourism industry, we argue that the role of DMOs, and the ways that they define and manage knowledge, must change in order that boundary objects can produce sufficient common understanding across heterogeneous groups to achieve cooperation whilst maintaining the value that the divergent viewpoints contribute to innovation and change (Star & Griesemer, 1989). DMOs are in a position to assist the industry to adapt and proactively deal with change, to the advantage of both the industry and the tourism consumer. However, they can only do this if they are capable of developing and sharing appropriate knowledge; consequently, knowledge management becomes a fundamental element of effective practice.

Indeed, research on DMO challenges following the September 11 attacks (Gretzel et al., 2006), suggested strategies for dealing with the increasing complexity of the environment and role of DMOs focused on interaction, complexity and connectivity. Among the challenges for contemporary DMOs identified by industry experts were 'managing expectations' and 'recognizing creative partnering as the new way of life'. The industry experts discussed DMOs' reliance upon modes of delivery in which information was transferred through print and web, stating the need for new foci, particularly those enabling more effective communication and knowledge development across organisational and disciplinary boundaries.

This paper explores the relationship between knowledge development and boundary spanning activities within DMOs and between tourism stakeholders in preparing for and responding to crises. The argument is made that increased communication can be facilitated by developing processes to support boundary spanning and boundary object development, enabling the sharing of knowledge between different and diverse actors. The paper outlines different forms of knowledge and approaches to knowledge management and posits that each of them requires active management in preparation for, and response to, crisis. For this management to occur, clear management arrangements must be developed within which the need for knowledge sharing is actively discussed and structures developed to support boundary spanning activities.

The Role of Knowledge Brokers, Spanners and Objects

Boundaries are present within, and between, all aspects of organisations and between different stakeholders within a system, including the tourism system. The wide range of tourism stakeholders will need to work together to integrate their different fields of knowledge in order to develop and implement effective tourism crisis and disaster strategies and actions. As Turner and Toft (2006, p. 203) suggest ‘...lessons identified need to be passed on effectively to those who need to know about them, and that they be passed on in such a way that appropriate action indicated by them is encouraged.’ Such a situation will require stakeholders to share knowledge and develop a system to enable sharing and re-interpretation of knowledge spanning across boundaries and diverse groups. In simple terms, a broker or spanner is an individual or organisation who acts as an intermediary between at least two other parties or communities of practice. A broker’s role is to facilitate the movement of ideas and knowledge by bringing people and diverse communities of practice together and enabling them to create and share new ideas, thereby supporting the creation and flow of knowledge. In undertaking this role, knowledge brokers add value to their own organisational activities. Consequently, a knowledge broker plays an important role in matching different (and often dispersed) knowledge sources together (Aalbers et al., 2004; Hargadon, 1998; 2002; Sharon et al., 2000).

A knowledge boundary spanner is an individual or organisation that recognises a problem and may facilitate the transfer of knowledge from one party to another through facilitation that enables the recognition and understanding of the knowledge of others. This may mean organising meetings and bringing stakeholders together, but it may also include the need for translation across language boundaries and domains to enable common understanding and reducing political rivalries in order to facilitate the generation of knowledge. Nevertheless, boundary spanners do not have the information or knowledge themselves, but act as facilitators. Spanners can be brokers, however, the difference between the two lies in that a spanner does not possess the knowledge that is to be transferred, whereas a broker does. Boundary spanners are ‘a means of cultivating the organisational ability to deal with the challenges of managing across boundaries’ (Levina & Vaast, 2005, p. 338). Boundary spanners can be perceived as:

- agents who identify, interpret and facilitate the movement of ideas, knowledge and innovative practices between domains and diverse groups (such as tourism, emergency management and aid agencies in the context of tourism crisis and disaster management);
- able to work with stakeholders to understand their explicit and implicit knowledge, and translate this across a boundary to unite different domains and groups for the benefit of all parties; and,

- having a difficult role merging a diverse range of domains and groups, each with their own sets of ideas, understanding and knowledge (both tacit and explicit).

Boundary spanners and knowledge brokers are more likely to be those organisations in the tourism system that can enable the sharing of knowledge between stakeholders. The types of agents that can act as boundary spanners or brokers include DMOs (from national, regional and local levels), industry associations and government agencies. Paraskevas and Arendell (2007) suggest that DMOs should advocate a ‘no-fault learning culture’ within the destination in order to facilitate learning transfer and the sharing of crisis knowledge and experience without fear of failure or blame. Brokers and spanners may identify where useful knowledge might be, who else needs to know it and how to link these parties together to enable the flow and creation of knowledge, not just information. However, importantly potential spanners and brokers should also consider how new knowledge can be created and developed. This will also be a brokerage role, but this time it will also include enabling different parties and organisations to share all forms of knowledge (including tacit and explicit), and helping them to learn through challenging and testing existing mental models for more effective adaptive management of crises and disasters.

How much energy is required of the boundary spanner depends upon the nature and the complexity of the knowledge held at the boundary and ‘...boundary spanning becomes more important as the pace of change in the environment increases’ (Hazy & Tivnan, 2003, p. 115). Table 1 is based upon work by Carlile (2004) and outlines three properties that can be held by the knowledge at the boundary; it highlights the importance of context and complexity in crisis situations. The table suggests that for crises or disasters that have been encountered in the past, and information has been perhaps gathered on those, the focus of boundary spanning will be on difference and dependence in order to adapt an already formulated strategy or approach to tourism crisis and disaster management. This will most likely ensure access to, and transfer of existing knowledge. If novelty of explicit or tacit knowledge is required, then the focus may have to be on the development of new ideas, meanings and actions. In this case, the type of boundary to be spanned becomes particularly important.

Table 2 outlines the types of boundaries, their definitions and potential application to tourism crisis and disaster management. The pragmatic or political boundary and knowledge properties of novelty, pose the greatest challenge to boundary spanners and tourism crisis knowledge management. Such situations will require stakeholders to share knowledge, possibly across locations and between organisations that may have different goals, history, expectations, budgets and knowledge levels. At the same time, political differences between organisational members in different domains make the recognition of ‘what counts’ as valuable knowledge problematic. When people with different bases of common knowledge meet at domain boundaries they struggle to assert the value of their domain-specific common knowledge – the resulting mismatch requires effort in negotiation, so that the novelty is recognised and can be transformed across the boundary. Identification of boundary spanners and their role in facilitating knowledge management is vital. The use of boundary objects, which is something that can be used across different contexts to share both explicit and tacit knowledge (Carlile, 2002; Miller, 2005), can include three different types according to Carlile (2002):

1. *Repositories* which supply a common reference point that provides shared definitions and

- values for solving problems.
2. *Forms* to provide a shared format for solving problems across different settings.
 3. *Objects, models and maps* can act as simple or complex representations that can be observed and then used between and across different settings systematically.

[INSERT TABLE 1 ABOUT HERE]

[INSERT TABLE 2 ABOUT HERE]

Boundary objects that are simply based on information processing, and not knowledge management, may not be complex enough to develop new knowledge through managed reflection and organisational learning, but may be useful for syntactic or information processing. Knowledge needs to be diffused and used through expressions of organisational knowledge including boundary objects such as organisational models, policies, procedures, products and services, information systems and artefacts. These may be, according to Jashpara (2004) structured (financial and business data), semi-structured (policies, plans) and unstructured (videos, e-mail, presentations).

How this knowledge is developed, stored and transferred to stakeholders depends upon the view of the knowledge broker or spanner. According to Jashpara (2004) two main approaches exist:

1. A *codification-based strategy*, which is technology-led, based on explicit knowledge that is codified and is database driven. This tends to result in a focus on the creation of knowledge objects and templates for stakeholders to access.
2. A *personalisation based strategy*, which is people-led, based on tacit knowledge, which is developed through engagement in dialogue and where expertise is channelled. This approach emphasises knowledge sharing and mentoring amongst colleagues.

Managing knowledge across boundaries

Making knowledge available and assessable in order to support organisational responses in times of crisis and disaster is an inherently complex problem for DMOs. Much work has been done in the knowledge management literature to explore the approaches that organisations take in their attempts to create and manipulate organisational knowledge. Earl's (2001) taxonomy captured the central approaches to knowledge management and the underlying attributes on which they were built. Blackman and Kennedy (2009) extended the taxonomy to reflect advances in knowledge management theory and acknowledge the various philosophies underpinning their development. The taxonomy aligns with, and augments, Carlile's (2004) integrative framework, suggesting the opportunity for more effective practice in increasingly turbulent environments.

Table 3 identifies Carlile's 'Transferring Knowledge' domain as being within the Technocratic School, illustrating the preoccupation with information systems in providing opportunities for information exchange. This fits with the current focus upon IT solutions and the idea that the provision of an appropriate information system will enable knowledge transfer. 'Translating Knowledge' is evidenced within the Behavioural School, with translation being reliant upon a directed focus on community where collaboration, contactivity and exploitation of knowledge drives members toward production and sharing of institutionally sanctioned knowledge. Those

subscribing to this view argue the need for review groups, action learning sets and ways of supporting managed interactivity. 'Transforming knowledge' occurs in the Integrative School where interaction and diversity, through negotiation of conflicting interests and epistemological stances, inspires novel forms of knowledge. Transformation of organisations may occur when knowledge creation is enabled and the organisation structures itself to accommodate novelty. Structures for this are harder to develop but will emerge where groups work towards new ideas without being driven by prior experience. It is here that boundary spanners are vital as the integration of different world views and experiences may lead to novel ways of linking knowledge in order to develop new ways of working.

[INSERT TABLE 3 ABOUT HERE]

The Integrative School provides important knowledge management concepts and practices for improving the availability of current, useful and accessible knowledge that is available across boundaries. This access and the ability to assess knowledge is vital if DMOs are to develop appropriately tailored strategies which allow them to gain value from 'the transformational connotations' emerging from crisis and disaster.

Insights from complexity theories (Kauffman, 1995; Waldrop, 1994) inform approaches to organisational knowledge that recognize that knowledge emerges through the interaction of diverse agents within a specific context and historical milieu (Kennedy, 2007; McElroy, 2000; Stacey, 2001), while tourism has been recognized as a complex system (McKercher, 1999). It is the conflict and negotiation of interests between boundary spanning agents within a changing environment that leads to adaptation (Hazy & Tivnan, 2003) and transformation. Complexity highlights the emergence of surprise outcomes resulting from this interaction of individuals, the self-organising capacity of groups and the concerning limitations inherent in attempts to direct groups toward fixed outcomes. It provides a perspective within which the system can be seen as less rational (Frank & Fahrback, 1999, p. 269) than traditional views on organisation suggest. It focuses attention on the influence of exogenous impacts on individuals and their interaction with diverse others within, and beyond, the organisational boundary, recognising the impact of the context or landscape within which individuals attempt to improve their fitness (Anderson, 1999).

Requisite diversity has long been proposed as critical to creative social interaction and the type of innovation critical to organisations responding effectively to novelty (Nonaka & Takeuchi, 1995) and crisis. As Kauffman succinctly states, 'Diversity begets diversity' (1995, p. 296). Other authors in organisational theory who draw on complexity add further weight to the appropriateness of the strategy of 'mixing it up': for example Stacey (2003, p. 417) asserts that,

Transformation is possible only when the entities, their interactions with each other and their interaction with entities in the system's environment are sufficiently heterogeneous, that is sufficiently diverse' so that 'New themes emerge as people struggle to understand each other and as their conversations are cross-fertilised through conversations with people in other communities and disciplines.

Workplaces, therefore, which limit diversity in workplace experience or 'inter-subjective encounters' (Dovey & White, 2005, p. 246) constrain opportunities for development of new knowledge. Exposure to contextual change opens new niches within which diversity can emerge

through opportunities for new interactions; in a continuous way, it enables DMOs to cooperate in ways that can result in an increased capacity to respond to new environmental opportunities. Diversity, then, leads to the development of new knowledge through the interaction and relationships between individuals in groups with diverse and even divergent interests. However, in Carlisle's (2004, p. 555) terms, when innovation is desired, it is important to reduce the practical and political mismatches that occur at the boundaries between organisational domains. He argues that in contexts which are characterised by high levels of novelty (such as those in times of crisis and calamity), organisational members have inadequate common knowledge to appropriately '...share and assess domain-specific knowledge at the boundary'. So, increasing novelty requires increased effort on the organisation's part to ensure knowledge sharing, critique and creation takes place.

The challenge for DMOs in gaining advantage from the transformative connotations of crisis and disaster exists in their ability to invest energy and resources in strategies that generate new common knowledge amongst stakeholders. This generation necessarily demands approaches that recognize complexity and support the creation and dissemination of transformed domain-specific knowledge in plastic yet robust boundary objects (Star & Griesemer, 1989). These approaches are espoused in a broad range of literature (Kennedy, 2006; Stacey, 2001; Van Eijnatten, 2004; Wheatley, 1999); possible strategies include: development of ideal types; promoting interactivity and validating emergent knowledge; recognising knowledge as complex, situated and active; providing expansive environments for learning (Fuller & Unwin, 2004); supporting autonomy; tolerating risk and providing opportunities for collectives to work on shared problems.

Implications for effective management and governance

The question is, what are the implications of all this for effective DMO management and governance? Overall, it means that DMOs need to actively consider what knowledge they need, how to harness it, how to share it and what does this signify in terms of boundaries and boundary spanners. Since governance is the process of decision-making as well as the process by which decisions are implemented, an analysis of governance focuses on the formal and informal actors (boundary spanners) involved in decision-making and implementing the decisions made, as well as formal and informal structures (boundaries) that have been set in place to arrive at and implement the decision. In terms of DMOs crisis knowledge management, there need to be conscious decisions about how to facilitate communication and knowledge transfer between the different partners and stakeholders. A key governance decision that needs to be active, rather than emergent is the choice of boundary spanners. For this to occur the function must be acknowledged, as the whole concept of the role and how it should be addressed will need to be actively discussed within the DMO. As a part of this, the boundaries will need to be identified and then all three forms of knowledge need to be considered at this stage: transferring, translating and transforming.

Transferring

There needs to be a greater focus on the various ways in which knowledge exists within and between organisations and the ways in which it is validated and utilised. Investing energy in facilitating continuous discussion between members of stakeholder organisations to enable greater common knowledge must become a core role for the DMO and, in times of crisis, bringing people together (either through Web2 environments or face-to-face) for problem articulation and translation exercises. Identifying the various sources of difference, dependence

and novelty and attempting to articulate the ways in which these impact on interaction are also important roles for DMOs. Providing ways in which stakeholders of all sizes and power bases can contribute meaningfully to the knowledge base of the collective industry will also provide opportunities for new and novel outcomes. Again, Web2 technologies can 'level the playing field' (Gretzel et al., 2006, p. 121) so that less powerful agents can make significant contributions to the emergent knowledge required for these complex circumstances. Pforr and Hosie (2007) agree by suggesting that because of the geographical dispersal of tourism organisations, the use of technology (such as content management and digital storage devices) may be an effective strategy.

Not only must there be regular communication, there must also be effective data storage and retrieval so that effective tracking of history and decisions is possible. Blackman et al. (2006) argue that without clear reporting, although decisions may be recorded the reasons will be lost; governance decisions about tracking and reporting will be crucial for interpreting events and outcomes at a later date. Research has illustrated that DMOs involved in crisis management may not develop and transfer emergent knowledge from past crisis experiences (Armstrong & Ritchie, 2007; Cioccio & Michael, 2007; Hystad & Keller, 2006; 2008). This in part may be because there is an assumption that large-scale incidents are unique and unlikely to re-occur (Turner & Toft, 2006). In this case the boundaries will be anything that prevents the effective transfer between stakeholders, thereby preventing historic understandings to be applied appropriately. Boundary spanners will be those who enable the knowledge to be captured, stored, shared and disseminated in ways that all interested parties can both access and understand. In terms of governance, structures and systems must enable the sharing of intellectual property and the management of risk effectively in this area.

Translating

DMOs need to be innovative and adaptive in order to be able to manage and support learning in the current context of changing/turbulent situations. In order to do this they will not only need to store and transfer knowledge, they will also need to actively seek out knowledge that may not be obviously relevant, or may only become relevant when seen through the eyes of another. Blackman and Henderson (2004) argue that, unless there is managed challenge to mental models, what is found through environmental scanning will merely replicate the knowledge already in place; those seeking will look in the same place and expect the same outcomes. Consequently, for there to be novelty through translation occurring by finding new ideas or knowledge, or by linking ideas together in a new way, there must be ways of ensuring that individuals come together who will see the world in different ways. This will require structures and systems to support cross-disciplinary developments and changes to mental models to enable the translation of appropriate knowledge across different domains.

Transforming

Knowledge management in the Integrative School requires agents to develop clear understandings of their own internal models and exert energy in attempting to understand those of other stakeholders. In terms of governance, this is about discussing all the potential issues and trying to enable self-organising systems which do not continually try to break down structures and knowledge sets. Something is self-organizing if, left to itself, it tends to become more organized, which may seem unlikely (Dempster, 1998). What is important is that the driver for change is internally triggered rather than externally. In terms of governance, this means that

review systems need to encourage managed scepticism, ongoing challenge and freedom to change in order to prevent systems or benchmarking becoming too restrictive (Blackman & Henderson, 2005). DMOs and tourism stakeholders must negotiate political, knowledge or organisational boundaries in constructive ways, using various interests to transform domain-specific knowledge through interaction. An integrative approach leads to the consideration of optimal diversity and encourages practice and opinion that disrupts stagnant internal models at individual, collective and organisational levels. The key is to continually reconsider the outcomes and the vision and be driven by that, rather than the inputs and processes designed to get things done. The governance strategy needs to treat knowledge transformation as a necessary organisational capability and make sure that there is enough room and freedom for growth, that novelty is always welcomed and questioned in terms of utility not necessarily certainty; this implies that there needs to be a move towards managed pragmatism as well (Menand, 1997). Such a concerted effort to actually discuss the nature of the knowledge required for DMOs may lead to very different governance and structural systems and processes.

Conclusion

In this paper we have argued that knowledge management is crucial to the effective management and governance of DMOs in times of crisis, and part of the expansion of DMO roles beyond marketing activities. There needs to be recognition that, unless the appropriate knowledge is available to enable better decisions, valuable time and impact may be lost. As discussed earlier in the paper, information is different to knowledge, and strategies need to be implemented by DMOs to generate, capture, store and retrieve relevant knowledge. It is likely that, as there are multiple stakeholders involved, there will be boundaries between the parties that will need to be actively managed. Therefore, the role of the DMO is less about recovery *marketing* from crises but more about recovery *management*, with knowledge playing an important part of effective management. The paper has integrated Carlile's (2004) boundaries to the different schools of knowledge management and identified that all three forms of knowledge need to be governed and managed in order to enable effective DMOs. This is a theoretical paper that calls for integrative knowledge approaches and, potentially, managed pragmatism and scepticism.

We call for more research which applies these ideas and considers if the implementation of these proposals would lead to greater effectiveness in managing crises in tourism. The identification of useful boundary objects and appropriate actors to play the role of boundary spanners and how these actors would operate within an effective governance structure, is an important area for future investigation. Specifically research is required into the direct and indirect knowledge flows in tourism during crisis management, and the role of DMOs in transferring, translating and transforming knowledge across boundaries, particularly in making tacit knowledge explicit. An assessment of the type and effectiveness of boundary objects and knowledge management philosophy (codification or personalization based strategies) in managing tourism crises should also be examined by researchers. Research is required into the stages of knowledge management, as well as learning and adaptive management from DMOs and other knowledge spanners/brokers such as industry associations. The crisis and disaster lifecycle (see Faulkner, 2001 and Ritchie, 2004) could be used as a framework to comprehensively assess the capture, storage and retrieval of knowledge strategies of DMOs before, during and after crises.

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Table 1: Knowledge Properties applied to Crisis and Disaster Management

Properties of Knowledge at a boundary	Theoretical Explanation	Application to Tourism Crisis and Disaster Management
Difference	Difference in the amount or type of knowledge held by agents within different domains at the boundary.	When a disaster occurs the knowledge locally may differ from different agents and domains such as emergency managers, tourism organisations and DMOs. Previous experiences may highlight differences in knowledge and actions, rather than enabling integrated and coordinated crisis management responses.
Dependence	Where entities or agents must combine (or at least take into account) their knowledge in order to achieve a specific goal.	Hotels involved in hosting emergency workers and tourists after a natural disaster will rely on knowledge from emergency managers on the needs of both groups for access to shelter and resources and on DMOs for coordinating this information.
Novelty	This may either be novelty in the case of new knowledge being needed and created, or that there is novelty across the boundary as different agents are unaware of each others knowledge.	It may become apparent that the media need to be made aware of the realities of recovery efforts, so that negative images and stories can be reduced during the recovery phase. DMO recovery marketers may be unaware of the needs of media for timely communication, relevant images and story leads due to a lack of experience in crisis communication.

Source: Adapted from Carlile (2004).

Table 2: Types of knowledge boundary and application to DMO tourism crisis and disaster management

Type of Boundary	Definition and Application to Tourism Crises and Disasters
Syntactic or Information Processing	<p>This is where the focus is upon transferring knowledge across the boundary in order that all agents understand it. For such an approach to be successful there will need to be a common lexicon developed which will enable the effective communication and mutual understanding of knowledge. This will usually need stable conditions, rarely found within contemporary organisations. Shared boundary objects such as repositories, forms and reports can help span boundaries to clarify facts, differences in meanings and agreed upon tasks.</p> <p>In the case of tourism crisis management this could include DMOs as knowledge brokers and boundary spanners facilitating the sharing of information on tourism crisis protocols, mobilisation systems, and defining who is responsible for certain responses and actions. Workshops may be required to discuss and clarify meanings, develop a common language and allocate responsibilities. Repositories of information and data, such as the National Tourism Incident Plan in Australia, can help identify responsibilities for tourism crisis management at a national level and define key concepts.</p>
Semantic or Interpretive	<p>This boundary focuses upon translating knowledge. It will occur when novelty affects the levels of difference or dependency. Here, the new knowledge will necessitate the creation across the boundary of new meanings to explain the discrepancies and enabling shared understandings. This may occur through the translation of meanings and/or negotiation between agents in order to reach a common agreement.</p> <p>This will occur in tourism crisis management where there is a new incident to be addressed but where current knowledge will enable a solution, providing everyone can access and understand what is being planned and meant. The focus will be upon effectively sharing the ideas being implemented, so that one group can translate localised knowledge into forms that the other group can understand. A specific example is the ‘Prepared and Protected Video’ developed to communicate to the Australian accommodation industry the important role they would need to play in a potential influenza pandemic. The video was initially designed for health care professions, but was adapted and used for training accommodation staff in hotels. DMOs could play an important role in helping translate materials from government</p>

	health and security agencies to the tourism industry.
Pragmatic or Political	<p>The focus here is upon transforming knowledge. It will occur when novelty presents different knowledge outcomes or requirements which lead to different interests among agents needing to be resolved. This boundary recognises that knowledge is invested in practice and that there are potential conflicts and/or costs to do with sharing if to do so creates negative consequences for those in another domain. This is where resistance to innovation and adaptation may occur and where the most complex processes will need to be developed to overcome such potential difficulties. It is expected that some progress is made on the previous two categories to develop shared meanings and understanding.</p> <p>In tourism crisis management terms this will be where currently understood and applied strategies are ineffective and new ones must be developed either, because some parties simply are unaware of current possibilities, or because the way the problem is being addressed may be unsuitable. Boundary objects, maps and models may need to be used to transform embedded knowledge into knowledge that all stakeholders can understand and share rather than simply exchanging or transferring knowledge. An example is the use of scenario planning workshops undertaken by Visit Scotland, which brought out tacit knowledge and explicit knowledge in workshops on how to deal with tourism crises. Possible responses were then modelled showing the potential impact on the tourism economy.</p>

Source: Adapted from Carlile (2004).

Table 3: Knowledge Management Taxonomy

Types of Boundary	Transferring				Translating			Transforming	
School	Technocratic			Economic	Behavioural			Integrative	
Attribute	Systems	Cartographic	Engineering	Commercial	Organizational	Spatial	Strategic	Complex	Epistemological
Focus	Technology	Maps	Processes	Income	Networks	Space	Mindset	Interaction	Nature of knowledge
Aim	Knowledge bases	Knowledge directories	Knowledge flows	Knowledge assets	Knowledge pooling	Knowledge exchange	Knowledge capabilities	Knowledge creation	Knowledge wholism
Unit	Domain	Enterprise	Activity	Know-how	Communities	Place	Business	Individual/collective	Individual/collective/organisational
Critical success factors	Content validation Incentives to provide content	Culture/ incentives to share Knowledge networks to connect people	Knowledge learning and information Unrestricted distribution	Specialist teams Institutionalised processes	Sociable culture Knowledge intermediaries	Design for purpose Encouragement	Rhetoric Artefacts	Learning Accommodating emergence Narrative	Variety
Principal IT contribution	Knowledge-based systems	Profiles and directories	Shared databases	Intellectual asset register and processing systems	Groupware and intranets	Access and representation-al tools	Eclectic	Social network analysis Web 2	Multiple targeted
'Philosophy'	Codification	Connectivity	Capability	Commercialisation	Collaboration	Contactivity	Consciousness	Complexity	Cognition

Source: Blackman & Kennedy (2009).