Orphan knowledge: the new challenge for knowledge management

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Abstract To date knowledge management within learning organizations has focussed upon maximizing possibilities to create knowledge while minimizing the chances of losing knowledge. However, knowledge management needs to consider a third option: dealing with orphan knowledge. There are situations where organizations forget things and repeat past mistakes. Do organizations really “unlearn” or just merely forget? In answering the affirmative to this question, various scenarios are presented which may lead to creating orphan knowledge, knowledge forgotten, separated, or isolated within the organization. Orphan knowledge management needs to consider different knowledge types and their ease or otherwise of becoming orphaned. Orphan knowledge management should begin with a status assessment of the organization’s true “knowledge position”. Processes of orphan knowledge recovery or the development of strategies to minimize orphan knowledge should play a significant part in any organization’s strategic knowledge management plan. Within this context the role of the chief knowledge officer is seen as an important part of this strategic knowledge management plan.

Introduction

The word “orphan” normally brings up images of destitute children separated from their parents and put into an institution of some sort. As depicted in the novels of Charles Dickens, orphans are placed into cold and forbidding places that offer little in the way of solace for their inhabitants. This paper will not consider these darker and more pejorative aspects of an orphan, but rather focus on the concepts of isolation and separation. The paper will argue that similar separations of some organization knowledge can occur from other knowledge that is well recognized and well used. The presumption that the former sort of knowledge is not valuable to the organization, because it is not well recognized and well used, needs to be challenged. It may be just as important for organizations to develop techniques or procedures that search for and recover their orphan knowledge as it is to develop procedures and techniques that facilitate knowledge creation and minimise knowledge loss.

Organizations are dynamic rather than static constructs (van Iterson, 2000; Kazanjian and Rao, 1999). People come and go, parts of the organization are divested or new parts are acquired, the organization is merged into another organization, and so on. If organizations are dynamic then so must be the knowledge generated or lost by organizations. Knowledge management needs to cope with knowledge created (intellectual assets) as staff (either individually or in groups) learn new things or invent new ways of doing things, as well as with knowledge lost which, over time, could create intellectual liabilities.
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(Caddy, 2000). Fisher and White (2000) provide an insight into this dynamic view in discussing downsizing and its effect on an organization's learning capacity. Obviously organizations need to have systems in place that track both knowledge recently created or recently lost. However, these systems will not in themselves identify all knowledge contained within or owned by the organization. Where these systems are only concerned with knowledge created or knowledge lost then the possibility arises in which part of the organization's knowledge can become orphaned.

Is orphan knowledge merely knowledge lost?

There is a difference between knowledge orphaned and knowledge lost. Consider the recent resignation of Amazon.com’s chief operating officer and president, Joseph Galli (San Jose Mercury News, 2000). News of the resignation contributed to an 8 per cent fall in Amazon.com’s share price; the market devalued the company due, in part, to the knowledge lost by Galli’s departure. However, we need to differentiate knowledge that has gone missing, been isolated or separated inside the organization from knowledge lost as this example indicates. A difference between knowledge lost and knowledge orphaned is that orphaned knowledge can be rediscovered, by using techniques such as “knowledge mining” (Zorn et al., 1999; Gardner, 1998). Knowledge lost is a more permanent decrement to the organization’s knowledge base. Knowledge lost needs to be recovered or regenerated rather than rediscovered. Orphan knowledge is the sort that Lew Platt, CEO of Hewlett-Packard was talking about in his now famous quote (Caulkin, 1998):

If HP knew what HP knows, we would be three times as profitable.

Another example: suppose an organization employed one network security expert. Given that this specialty is in high demand, the employee was head hunted and eventually lured to another organization. When this employee leaves the organization, there is a knowledge decrement, i.e. lost expertise about network security. This event may also be the root cause of an intellectual liability as the organization’s information systems are now more vulnerable. One week after this employee leaves the intellectual liability crystallizes when the organization experiences a major e-mail virus attack which severely damages the organization’s reputation for competence in the area of information technology service delivery. The organization can reacquire the knowledge lost by recruiting another network security specialist with the same experience and expertise, or selecting someone with less expertise and experience and then training them. If orphaned knowledge is knowledge that is “missing”, it can be recovered without having to “relearn” that knowledge as indicated in this example.

Recovery of orphaned knowledge requires different activities to those described above. The knowledge still resides within the organization; it is orphaned but not lost to the organization. To some extent the recovery process or procedure for orphaned knowledge will be contingent upon the type of
knowledge and how that knowledge was orphaned in the first place. Different organizations often apply their intellectual capital in different ways to improve performance, keep up with or better their competitors, enter new markets, invent new products and so on. This not only leads to differences in how intellectual capital is measured and valued by organizations (Caddy, 2000; Harvey and Lusch, 1999; Wileman, 1999; Bradley, 1997; Brooking, 1997), but also will have an impact on the strategies and processes adopted in order to manage their orphan knowledge. With respect to gaining maximum value (or minimizing orphan knowledge creation) this paper will consider the role that social transactions can play in reducing orphan knowledge, as well as analysing types of knowledge possessed by organizations and the relative potentials for these knowledge types to become orphaned.

**Processes of knowledge orphaning**

How does knowledge become isolated or separated from “mainstream”, or well known, knowledge inside an organization? Using Saint-Onge’s (1996) classification, the following scenarios (which are by no means exhaustive) provide an insight into the orphaning process:

- **Orphan knowledge and human capital.** Human capital is concerned with knowledge encased within the brains of the human beings that work for the organization. Suppose an organization takes on a new employee. In terms of human capital, there is a net addition to the organization’s intellectual assets (Sveiby, 1998; Bukowitz and Petrush, 1997; Stewart, 1997; Bontis, 2001a). But does the organization utilize all of this new employee’s talents in their current position? People normally possess multiple skills and expertise, but may find that their current job does not allow them to utilize, apply or develop all of their skills, expertise and knowledge (Mueller and Dyerson, 1999). The organization may attempt to compile information on employee skills, expertise and knowledge through a skills audit, but employees may be reluctant to provide a complete personal profile for a variety of reasons. In both situations there is orphan knowledge: some of the employee’s knowledge is isolated within the organization’s total knowledge base. This orphan knowledge could be missing temporarily (employee is transferred to another position where the unused knowledge can applied), or may transform into knowledge lost where, due to the passage of time, the employee forgets the knowledge or decides not to keep this knowledge up to date.

- **Orphan knowledge and customer capital.** Orphan knowledge can occur within the organization’s supply chain, either on the upstream side (the organization’s suppliers), or the downstream side (the organization’s customers). To ensure that orphan knowledge is not created within customer capital, flexibility in managing the relationship, trust, and openness would be critical factors. For example, considering the
upstream side, the organization may have outsourced information technology (IT) service delivery. In terms of implementing and utilizing new IT the organization will now rely heavily on knowledge flows from their “IT partner” to them. If this knowledge flow is either restricted or does not occur then the organization should be considered to have orphan knowledge. A similar situation could occur where a first tier supplier is asked to make a substantial knowledge contribution towards the development of a new product and is reluctant to do so or provides only a small proportion of the knowledge it possesses that would be relevant to this project.

- Orphan knowledge and structural capital. There is a focus on this type of intellectual capital with respect to orphan knowledge: terms such as “knowledge mining” have been used (Ruber, 1999). Examples of organizations that have successfully recovered this type of orphan knowledge are IBM (Huang, 1998) and Dow Chemicals (Zack, 1999). Knowledge orphaning may occur due to the lack of suitable structural capital such as GroupWare systems and other computer mediated communication technology. These technologies offer another mode of knowledge transfer. Indeed Levitt and March (1988) consider that knowledge transfer can be likened to a disease that spreads through an organization from those that have the knowledge to those that do not. Where organizations have multiple communication channels then these organizations will find knowledge transfer, and possibly knowledge creation or enhancement an easier task. One could also surmise that these organizations are also possibly more resistant to knowledge orphaning. Corporate memory is obviously assisted where social transactions are conducted through a digital medium as it allows members of the conversation to leave a residue of that conversation behind. However, structural capital enhancements such as implementing GroupWare, may still mean that orphan knowledge is created. In terms of the communication process has there been an effective transfer of knowledge? A perennial problem with information systems developments occurs during the user requirements phase in which interviews between users and system analysts are conducted. Even though both participants share the same language and probably nodded vigorously during the interview, these participants may leave the meeting with two different mental images about the information system’s future conceptual structure. Where incomplete or misdirected communication occurs (in which no one may be to blame), then another type of orphan knowledge has been created.

Do the above indicate intractable problems for organizations? The answer to this question is “No”. For example, to establish effective skills identification and tracking programs should not be beyond the capability of most organizations. Structural capital improvements, such as better internal communication
systems, only need to use existing, and quite mature, IT infrastructure. However, in other areas the task may be more complex. For example, if the organization needs to foster a better culture within its employees, say through creating a teams-based organization (Dyck and Halpern, 1999), then this will not be implemented by a simple decree or technological enhancement, but will be a difficult and drawn out process. Once achieved though the higher level of cross-functional social transactions should mean, ceteris parabis, that there is less chance of creating orphan knowledge. As can be seen from this example, improvements in the softer types and forms of structural capital may assist the organization just as much as the harder and more visible types of structural capital.

Social transactions in organizations and orphan knowledge
A common thread through the scenarios above concerns how to improve both the frequency and span of the organization’s social transactions. These transactions occur in a variety of forms. They occur as part of regular formal meetings, informal meetings, or conversations using telephone, videconference, GroupWare or e-mail. Social transactions create stories. In fact creating and propagating stories is probably the most common method used to disseminate knowledge. Whenever managers are faced with an intractable or unusual problem, they will usually call somebody and get their opinion or input. As Luther (1997) reports, storytellers and their stories played an important role in the interest generated by US corporations towards quality management techniques. Stories about Dr Robert Camp’s (1989) work on benchmarking during his time with Xerox were a significant factor in bringing attention to this management improvement technique. Organizations with a greater facility to gather and circulate stories within and without the organization should be more effective organizations. Their ability to utilize all of their intellectual capital will be greater and the opportunities in which knowledge may be orphaned should be reduced.

However, stories and the storytelling process do have limitations, and so improving the ability to conduct social transactions by the organization should not be seen as a panacea. Indeed Luther (1997) found that stories often focussed on the “how” but not the “why”. If this is so then a situation can develop in which “why knowledge” becomes orphaned. If “how knowledge” is seen as explicit knowledge whereas “why knowledge” is tacit then social transactions are more about transmitting explicit knowledge rather than tacit knowledge, which may be far more important to the organization in the long term, can be orphaned. Even with explicit knowledge, in the process of re-telling the story, the storyteller may not tell the whole story (either intentionally or unintentionally) and so orphan some explicit knowledge. It is clear that the processes of social transactions and their contribution to knowledge transfer deserve further attention particularly with respect to orphan knowledge.
Orphan knowledge: explicit vs tacit knowledge

Baumard (1999) has claimed that organization knowledge falls into four different categories, as shown in Table I.

Although the horizontal dimension is well understood, often the vertical one is not. The difference between explicit and tacit knowledge is often confused. Indeed because tacit knowledge is slippery in nature, it is often ignored by organizations that focus too much on managing their explicit knowledge. Tacit knowledge allows a good fighter pilot to fly a plane well, or a good police officer to make intuitive leaps in solving a crime. In cases where these experts are able to verbalize or document how they do things well then this tacit knowledge is transformed into explicit knowledge. Tacit knowledge does not necessarily remain tacit forever. Tacit and explicit knowledge are also transferred or communicated differently within an organization. For example, where a new member joins a project team a lot of explicit knowledge is easily gained from documents and face-to-face discussions with other team members. On the other hand, tacit knowledge within the project team, such as being able to identify potential problems early and so minimize their impact, is quite difficult to transfer. It is not a simple matter of reading the minutes of meetings or a procedures manual.

Baumard’s (1999) work provides a basis on which to assess different types of orphan knowledge as well as processes and techniques that could be applied to recover knowledge orphaned. Organizations could use the framework in Table I to make a status assessment – determine which quadrant most of their knowledge resides, and what sorts of activities or processes may either increase or decrease the chances of knowledge orpaning. For example, given the types of explicit knowledge provided in Table I, the organization could implement or improve personnel information systems or conduct a knowledge mining exercise. On the other hand, for the types of tacit knowledge, the organization could consider strategies such as peer and non-peer mentoring, or strategies to improve organization culture that facilitate greater knowledge and information sharing.

Identifying and recovering orphan knowledge

The first step in effectively managing orphan knowledge must be to complete a status assessment exercise and identify what knowledge has been orphaned or

| Knowledge type | Possessed by
<table>
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<tr>
<td></td>
<td>Collectively within groups</td>
</tr>
<tr>
<td>Explicit</td>
<td>e.g. mutually agreed upon and documented business rules; registered patents</td>
</tr>
<tr>
<td>Tacit</td>
<td>e.g. group heuristics; intra-group cohesion and stability</td>
</tr>
<tr>
<td></td>
<td>e.g. formal training and education; personal notes and documentation</td>
</tr>
<tr>
<td></td>
<td>e.g. problem solving skills; communication skills; negotiating ability</td>
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Table I. Classification of organization knowledge
what potentials exist to orphan knowledge. Without this exercise any attempt at downstream management of orphan knowledge, which may be fraught with difficulties (Lev and Mintz, 1999), will be a waste of time and effort. Identification will be contingent upon the organization and the environment within which it operates. However, the discussion above provided scenarios organizations could use to commence the process, as well as the examples provided in Table I. For instance, the status assessment exercise has indicated that there is not only an under-investment in training (Olsson, 1999), but also only scanty and quite out-of-date information available about current employees’ skills and expertise. Given this situation the organization should develop a suitable information system (a structural capital increment), so the organization can better account for human capital as well as report on areas in which orphan human capital knowledge has been recovered. Care should be taken during the status assessment exercise to ensure that attention is also directed towards tacit as well as explicit knowledge. Status assessment would complete with an account or report on orphan knowledge and activities that lead to knowledge orphaning. This account or report would need to consider the information needs of the different interested parties. For example, the types of reports produced for shareholders would be different to those produced for senior management. It may be that reporting on orphan knowledge is directed to the notes of the intellectual capital report rather than being disclosed within the main tables summarizing the organization’s intellectual capital position.

While it is important to perform the steps discussed above, it is far more important to have strategies in place to recover orphan knowledge, either explicit or tacit. Recovery of explicit orphan knowledge will be easier than for tacit orphan knowledge given the different nature of these knowledge types (Earl and Scott, 1999). As stated above, the commencement of an orphan knowledge recovery process should be a status assessment exercise. Who is best qualified to perform this exercise? In their analysis of the poor decisions made at COTC, Magasin and Gehlen (1999) make a case that this process should not be an internal one. Responsibility for status assessment should be given to an independent organization. Magasin and Gehlen (1999) found that in many of the decisions taken by COTC the organization did not have the capacity to act as its own devil’s advocate and stand outside of itself to question whether or not decisions being made were rational. This sort of “organization blindness” will lead to a flawed status assessment. The organization adheres to the illusion of good management and so believes that little orphan knowledge exists whereas in fact the opposite is a more accurate finding. Any recovery of orphan knowledge from this beginning would be fatally flawed. On the other hand, given that an effective status assessment exercise has occurred, regular accounting for orphan knowledge is a necessary component of an on-going management strategy. As was claimed at the beginning of this paper, organizations are not static but dynamic constructs and so a mechanism needs to put in place to identify new ways in which the organization can orphan knowledge, as well as recover orphan knowledge.
Increasing use of IT will not necessarily reduce the incidence of knowledge orphaning. Cross and Baird (2000) emphasize the importance of organization memory for effective knowledge management. However, for the organization to believe that more IT will effectively address the problems an organization has with its memory is simplistic for the following reasons. First “knowledge” stored within a knowledge repository does not necessarily mean that people in the organization know of its existence. Second, knowledge stored in databases and filing cabinets is usually explicit rather than tacit knowledge. Third, IT does not go out and actively search for the organization’s tacit knowledge and then somehow have the capacity to make this tacit knowledge explicit: human beings need to be involved. Fourth, although GroupWare provides the potential for more social transactions to occur, this is only a potential. Employees need to use the technology; it does not necessarily get used just because it is there. For these reasons humans and not just technology need to be involved. An important person who should be involved in orphan knowledge recovery (or orphan knowledge prevention) is the chief knowledge officer (CKO) (Earl and Scott, 1999; Bontis, 2001b). Some strategies that the CKO could investigate in this area would be to increase the level of social interaction that occurs in the organization, only some of which may be technologically assisted. Often an organization’s informal networks provide the necessary knowledge rather than a database or some other form of knowledge repository. As Cross and Baird (2000, p. 71) quite succinctly state: “In short, who you know significantly affects what you eventually know.”

Another important issue the CKO should ensure does not occur is an over-reliance on “other people’s knowledge”. Cross and Baird (2000) discuss the use of products such as KnowledgeSpace and PowerPacks. While these products are useful tools for novices they should be seen as that: used for a limited amount of time only. Organization culture should encourage, as these novices become experts over time, that they in turn make their own contributions to KnowledgeSpace or create their own PowerPacks. To rely on these resources for too long only creates yet another form of orphan knowledge. Finally, the CKO should ensure the organization recognizes the potential value that knowledge can create and the opportunity cost associated with failing to exploit fully all of the organization’s knowledge (Earl and Scott, 1999).

**Future research**

A case has been put forward claiming that some organization knowledge is not part of the organization’s intellectual assets or intellectual liabilities. This knowledge is termed “orphan knowledge”: knowledge that has gone missing or is separated or isolated from the rest of the organization’s knowledge. It is important for organizations to recognize the potential for generating orphan knowledge. In fact where an organization finds itself not performing as well as it used to, this may be due to a steady accumulation of orphaned knowledge or to an increase in the incidence of knowledge orphaning. Orphan knowledge may be contained within the organization’s explicit or tacit knowledge. One
issue that future research will address is the differing levels of difficulty between recovering explicit orphan knowledge and tacit orphan knowledge. Another important future research issue to consider is the role that an organization’s CKO should play in managing and recovering orphan knowledge. As such this paper is considered to be a beginning into the examination of orphan knowledge rather than a final review.

References


