KM 2.0: Employee Perceptions of a Wiki-based KMS Deployment

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Abstract

Knowledge management is an important competence for organisations to achieve in the new knowledge-powered economy. However, over a decade of attempts by organisations to achieve effective knowledge management supported by sophisticated technical tools has produced more failures than successes. With new 'Enterprise 2.0' tools powered by 'Web 2.0' technologies now ubiquitously available, organisations have a better chance than ever before to realise the dreams of knowledge management. But obstacles remain, many of them centering around employees' behaviour and perceptions. Organisations need to support and encourage employees towards knowledge management behaviours in order to successfully implement a KM strategy. We investigate the perceptions of employees in reaction to the deployment of wiki-based KMS application ìn a medium-sized multi-national corporation. We find that support and management is needed in six specific aspects of the KM initiative. The results should prove instructive to other organisations wanting to begin or improve their knowledge management strategies.

Of central importance is the changing nature of competitive advantage - not based on market position, size and power as in times past, but on the incorporation of knowledge into all of an organization's activities.

- Leif Edvinsson, world's first corporate Director of Intellectual Capital

1. Introduction

This dissertation is concerned with gaining insight into people's perceptions as they react to an enterprise "wiki" product being rolled out as a knowledge management system (KMS) in a multi-national, multi-disciplinary corporation within the travel industry. In the first few years of knowledge management (from the late 1990's onward), many organisations focused overly on the technological considerations of KMS implementation, overlooking issues such as executive support, the presence or absence of a knowledge-sharing culture, and employee motivations for contributing knowledge. These KMS[1] implementations were at best mediocre successes, at worst outright failures, with Mason and Pauleen (2003) citing a "50%-70% failure rate". With the emergence of "Enterprise 2.0" tools (powered by "Web 2.0" technologies) (McAfee 2009), the software packages available today for deployment as a KMS have improved considerably in utility, flexibility and ease-of-use in the last decade. As more people begin to use social media and related tools in their private capacities, the focus is further shifting to solving the "people problems" in the successful deployment of KM in organisations, as technology seems less of an inhibitor. By gaining insight into people's perceptions and paying at least as much attention to "non-technology" issues, organisations can re-balance and thus greatly improve their KMS roll-out strategy by including specific affordances to resolve key barriers encountered in driving adoption of both a knowledge-sharing culture and the tools to support it. In turn, organisations can better enjoy the benefits of KM including improved innovation, quicker time to market for

[1] The acronym 'KMS' is used for both the singular and plural of ' Knowledge Management System'.

new products and services, and a sustained competitive advantage.

This dissertation is structured as follows: Firstly, a review is presented of the literature on the nature of knowledge and how firms have attempted to manage it effectively, followed by an enumeration of the key success factors for a KMS implementation according to research. We also review what promise “Enterprise 2.0” tools bring to the KM table. Then, some background on the Travel Corporation and the state of the roll-out of wiki product in that company is provided, before explaining the methodology undertaken during the research. Finally, a discussion of the results is presented.

2. Literature Review

Although expounded upon since the times of Plato, the term ‘knowledge’ did not enter the regular vernacular of organisational theorists until the mid 1990’s, principally introduced by Nonaka and Takeuchi’s seminal book “The Knowledge-Creating Company”. Since Alvesson and Starbuck wrote about the “knowledge-intensive firm” as far back as 1992 (Starbuck 1992, Alvesson 1993) much discourse has taken place on the nature of knowledge and how best to manage it. A review of the literature reveals a huge range of taxonomies of knowledge and perspectives on knowledge management, each with differing focuses and valuable insights. Grant (1996) offers that there are “many types of knowledge relevant to the firm”. Yet the practices that an organisation will choose to better manage knowledge will ultimately be a function of how it chooses to define the nature of that knowledge. Successful KM initiatives will likely identify several types of knowledge and identify and implement the relevant strategies to better manage them, bearing in mind that in many taxonomies of knowledge presented in the theory, these types inter-depend, the whole being greater than the sum of its parts. Given the potential complexity of this situation, it is crucial to survey the literature of knowledge, and managing knowledge in the workplace, to be able to adequately synthesise key success factors of a KMS implementation. Indeed, Alavi and Leidner believe that “effective development and implementation of KMS requires a foundation in several rich literatures.“ (Alavi and Leidner 2001). This foundation will then frame the research undertaken in this study, which reveals further potential factors for KM/KMS success or failure.

2.1 On the Nature of Knowledge

Knowledge has as many definitions as definers. From Alavi and Leidner’s (2001) “justified personal belief that increases an individual’s capacity to take action” to Davenport and Prusak’s (1998) “fluid mix of framed experience, values, contextual information, and

expert insight that provides a framework for evaluating and incorporating new experiences and information", most to some degree incorporate the notion of the 'knower', the individual. Nonaka (1994), extending Michael Polanyi's conceptualization of the tacit element of knowledge (Polanyi 1966), distinguished between tacit and explicit knowledge within the workplace. Tacit knowledge relates to the cognitive dimension of 'knowing', is sensitive to context, is the result of experience and incorporates intuition or "compressed expertise" (Weick 1995) - often described as the 'know-how'. Polanyi (1966) argued that all knowledge is either tacit or rooted in tacit knowledge. Explicit knowledge is that which is more easily articulated, codified, and can lack context and still be valuable - described as the 'know-what'. Nonaka notes the inter-dependence of these two classifications to organisational knowledge creation through his socialization/ externalisation/combination/internalization model, detailing how knowledge can be transferred in four ways (tacit to tacit, tacit to explicit, explicit to tacit, and explicit to explicit) and this creates a snowball effect, or "spiral" (Nonaka 1994) of knowledge creation. Alavi and Leidner suggest the two types represent "not dichotomous states of knowledge, but mutually dependent and reinforcing qualities of knowledge" (Alavi and Leidner 2001), positing that at least some tacit knowledge is needed to enable the useful interpretation of explicit knowledge.

In some of the literature knowledge is just also talked about as an object, separated from the knower. Organisations that take this view may, according to Hansen (1999), follow a "codification" strategy of knowledge being codified into knowledge repositories for re-use elsewhere in the organisation. Following this perspective, the emphasis of a KM program and implementation of KMS should focus on building and managing "knowledge stocks" (Alavi and Leidner 2001), prioritizing the ease of contribution and accessibility through intuitive information architectures and superior search capabilities.

However, it is proved more popular in the literature to conceive knowledge as "embedded" in tools, processes and routines, new products and services, networks and of course individuals. Frank Blackler wrote as early as 1995 that "Rather than *knowledge* as something that people have, it is regarded that *knowing* is something that they do." (Blacker 1995), suggesting that the focus should not be on the knowledge itself but how that knowledge is mediated, situated and enacted in the workplace. Nonaka (1994) posits that knowledge can exist in the individual or the collective. Lave and Wenger (1991) expand the latter perspective of knowledge creation by revealing "Communities of Practice" where employees engaged in similar professions develop shared conceptions of their activities and in the process discover new and better ways of carrying out their work tasks. The CoP's are characterized by "mutual engagement, joint enterprise and shared repertoires" (Wenger 1998). Davenport and Prusak (1998) conceive of a similar notion when they suggest that knowledge can be generated by networks of "knowers", explaining "how extensively an informal network can generate knowledge when each participant adds an incremental portion."

Ultimately, in the spirit of George Box's "all models are wrong, but some are useful", no single perspective of knowledge outlined above is "correct". Alavi and Leidner (2001) state that the different knowledge taxonomies "can inform the design of knowledge management systems by calling attention to the need for support of different types of knowledge and the flows among these different types." Thus, the successful deployment of a KM program will draw from most if not all of these perspectives. Knowledge should be easily handled as an object when appropriate, with any chosen KMS supporting the ease of entry, ongoing manipulation and distribution, and universal access of knowledge that may or may not include situational context and remain valuable. On the other hand, the broader KM initiative will stand a better chance of success if certain knowledge-sharing processes are cultivated and encouraged, and the use of

a KMS that is threaded into those processes is prioritized (for example, a project team blogging about their latest improved working methods). The former considerations will focus on the capabilities of the technology, the latter will focus on the capabilities of the people and their managers.

2.2 Managing Knowledge in the Workplace

Pondering on the nature of knowledge is of little value to practitioners if it cannot illuminate effective strategies to manage it in the workplace. There is broad agreement that an organisation's knowledge is an asset that, if actively and carefully managed, can greatly contribute to sustained competitive advantage (Teece 2000). Grant (1996) helpfully extended Penrose's (1959) resource-based theory of the firm by conceptualizing the "knowledge-based" theory of the firm, proposing that knowledge may actually be the most important resource to an organisation in the new "intellectually-powered" economy. Evolving beyond a knowledge-as-object perspective, the literature reveals a broad consensus (Alavi and Leidner 2001) that competitive advantage through knowledge management is not achieved so much through focusing on what knowledge assets an organisation possesses at any point in time, but rather the systems and processes that support the ongoing generation, distribution, and application of knowledge into new products and services. Taking this perspective, the goals of knowledge management are less about assets and more about capabilities or KM-related "core competencies" (Hamel and Prahalad 1990). Any interventions, technological or otherwise, that can facilitate or even catalyze new ways of working that amplify Nonaka's socialization, externalization, combination and internalization processes (Nonaka and Takeuchi 1995) would be a key measure of success in any KM initiative.

One approach to KM, possibly advantageous as it is less disruptive to the organisation, has been to thread knowledge management practices into existing business processes, using

for example the CommonKADS methodology (Schreiber 2000). This allows the KM initiative to enjoy early success by focusing on those business processes that may be especially suited to benefit from systematic management of the knowledge involved in them. Nissen et al. (2000) suggests that the first stage of KMS design is actually appraising the business processes it aims to support, to gain an intimate understanding of the process flows that might expose KM-related opportunities.

The notions of knowledge and knowledge management have not been immune to criticism from certain academics. Ruggles (1998) attacks the dilution of the term knowledge management, claiming it is “a term which has now come to be used to describe anything from organizational learning to database management tools”. Further evidence of diffusion of the term may be found in Storey and Quintas’ (2000) definition of KM, which includes “sourcing, mapping, and measuring of knowledge”. Certainly measuring knowledge and the management of knowledge has not been treated in depth by much of the literature, preferring to offer that ROI on KM is somewhat difficult to quantify, and largely can only be anecdotally or qualitatively measured. Alvesson et al. (2002) criticise that the term is appropriable by various specialists, for unhelpfully disparate uses, for eg. IT professionals speak of “KM systems”, accounts speak of “intangible assets” and personnel management staff speak of “intellectual capital”. Nevertheless, our grasp of knowledge and knowledge management as discussed above surely afford us enough clarity to separate practices and behaviours as either promoting or retarding employees’ ability to socially undertake learning and skills acquisition in their organisations. We now take a closer look at what the literature reveals as the most important of these.

2.3 Key Success Factors

Early KM initiatives were technology-focused, and largely failed because they ignored several other influential aspects of organisational life (Ruggles 1998). With a better

understanding of knowledge and managing it in the workplace, we now draw from the literature what have emerged as the critical factors of success when implementing KM in the firm.

Culture is often said to be the biggest barrier to success for a KM initiative (Davenport and Prusak 1998, Alavi and Leidner 2001, Holowetzki 2002) and receives particular focus in much of the KM literature. There is broad agreement that a “knowledge-friendly organisational culture” (Alavi and Leidner 2001) is paramount, if not the most critical ingredient, to a successful KM initiative (Davenport and Prusak 1998). Early KMS implementations often required “profound cultural renovations” (Alavi and Leidner 2001) as organisations were rooted in a past of rewards based on the skills and know-how of individuals rather than groups. While there is some ambiguity in the literature about what the term “organisational culture” actually means (Benbya and Belbaly 2005), we are more concerned with the specific practices that the literature cites as critical in operationalizing a culture where knowledge is shared and valued.

Senior management support is often proposed as a major influencing factor on culture and critical to any organisational change initiative; a KM initiative is no different. Employees’ behaviour is regularly influenced by “executive signals” (McAfee 2009) that may encourage or inhibit a range of behaviours. In the case of a KM initiative, this was especially apparent at Xerox with their KMS “Eureka” (Benbya and Belbaly 2005). Though the same technology was in place across the organisation, some offices demonstrated a high usage of the system while others lagged behind. This was found to correlate with managers’ willingness to work with the teams, using, for example, video testimonials to drive adoption. To build a knowledge-oriented culture, senior management must not only visibly support those charged with driving the KM initiative, but also engage in knowledge-related behaviours themselves. A CEO, blogging company news and commenting on pages of interest, for example, would signal

that management takes knowledge-sharing and collaboration seriously (McAfee 2009), and helps to promote this kind of behaviour among employees. The literature (Davenport and Prusak 1998, Benbya and Belbaly 2005) favours recounting how Buckman Laboratories CEO Bob Buckman used to review submissions to Buckman's KMS, personally emailing employees that he noticed were not contributing knowledge. While it would be naive to expect all senior executives to show Bob Buckman's passion for knowledge (he went on to become a celebrated KM proponent and published his own book, *Building a Knowledge-Driven Organisation,* in 2004), it is important to note that clear, direct and sustained top management activity in the KM arena is critical to any successful KM initiative. While Ruggles (1998) found that a large number of executives surveyed chose "people issues" (culture, behavioural change, etc) as major barriers, the same survey revealed that 67% of executives said they believed that these issues could be overcome by more deliberate management, further reinforcing the need for strong leadership in any KM initiative.

The literature also highlights the importance of building a trustful environment (Davenport and Prusak 1998). This includes giving employees "slack" time that may be used browsing the knowledge-base, exchanging tacit knowledge at the water cooler and perhaps form Wenger's communities of practice outlined earlier. Trust is also engendered in the absence of a "blame culture", where mistakes are instead regarded as opportunities to learn. Levin and Cross (2004) found that benevolence-based trust "was especially important for the receipt of tacit knowledge".

Incentives and rewards can also play a key part in encouraging behaviours conducive to a knowledge-driven culture. Davenport and Prusak (1998) point out that most people are not naturally motivated to share their knowledge, being "intimately bound up in people's egos".

Thus, motivational aids should form part of a balanced KM initiative to help drive the correct behaviour. Davenport and Prusak (1998) further advise that motivational mechanisms can be long-term and baked into the usual performance evaluation of employees. A few questions regarding knowledge-sharing behaviours like “How regularly do you contribute?” help bring about more knowledge sharing behaviour. They also advise that short-term rewards should be as public as possible, signalling to employees that knowledge-sharing behaviour is valued by the organisation. Also, leveraging the aforementioned relationship between people’s knowledge and their egos, simple peer-recognition can be an effective reward mechanism (Benbya and Belbaly 2005). Anything that the KM program can do to amplify the celebration of an employees knowledge-sharing, for example having a “Knowledge-sharer of the Month” award, will help to positively reinforce desired behaviour. Furthermore, awarding a prize along with this title will further indicate the value of this behaviour in the organisation, and hopefully inspire others to similar action. However, Wenger et al. (2002) warn against getting the balance of intrinsic vs extrinsic behaviour incorrect, reminding us that in similar contexts of community participation, it is not extrinsic awards that motivate continued participation, but rather the intrinsic reward of peer recognition that sustains good behaviour. For this reason, Hasanali (2004) suggests that most extrinsic rewards should be deployed to initially entice users into the knowledge-sharing “community” of the organisation, letting the intrinsic rewards of community participation eclipse them in due course. Finally, Yahya and Goh (2002) advise emphasis on group-based compensation to encourage individuals to work as a team and thus lay fertile ground for knowledge-sharing behaviour.

Cultural traits for an organisation can also be engendered through targeted hiring practices. Davenport and Prusak (1998) cite the importance of “hiring new workers partly on the basis of their potential for knowledge behaviours”. Over time, this would ostensibly ensure that

at least a majority of employees have some experience or awareness of knowledge-sharing, thus making them more prone to contribute to a knowledge-friendly culture.

Another key success factor is resourcing the KM initiative with the correct type and numbers of staff. Benbya and Belbaly (2005), in their analysis of successful KMS implementations at companies such as Buckman Laboratories, Ernst & Young, HP and IBM, draw attention to the value of "structural mechanisms" (as opposed to cultural and managerial mechanisms). Efforts in this area were concerned with correctly resourcing the KM initiative, and ranged from "appointing a steering committee to the implementation of a separate organizational unit responsible for knowledge management" (Benbya and Belbaly 2005). Davenport and Prusak (1998) report from their research that Ernst & Young had several knowledge facilitators for different networks, as well as a Chief Knowledge Officer (CKO) whose duties include, according to Davenport and Prusak, evangelizing knowledge and learning activities and designing and maintaining the firm's knowledge infrastructure.

2.4 Enterprise 2.0 and KM

As the first case studies on knowledge management were published, researchers immediately advised against focusing too much on the role of technology in KM while overlooking the cultural and social aspects of knowledge management programs (Ruggles 1998). However, correct deployment into the enterprise of the new generation of "Web 2.0" tools including wikis, blogs and social media can fully support and even catalyze knowledge management practices in the enterprise (McAfee 2009). Davenport and Prusak noted (1998) that the advent of Lotus Notes and the World Wide Web in the late 1990's were "instrumental in catalyzing the knowledge management movement". Web 2.0 tools, with much improved levels of engagement and responsiveness, afford new heights of ease-of-use and a pleasurable and

satisfying user experience. Obviously, if a tool is easy and pleasurable to use, users will use it more. This is of particular interest to organisations as ostensibly, the more people use an organisation's KMS, the more that organisation's knowledge is actively and usefully managed, ultimately improving that organisation's competitive advantage (Nonaka 1994). The widespread integration of Web 2.0 technologies may indeed support ICT moving further along the continuum from mere 'enabler' to 'catalyzer' in terms of any broader KM initiative, as the sharing of information and the collaborating with peers is both more useful and more satisfying than with previous generations of technology. While Hansen et al. (1999) wrote of the advantages and disadvantages of a "codification" vs "personalization" strategy, modern tools can better facilitate the transfer of "personal" knowledge, but in codified form (eg. blogposts). This allows the modern large and geographically distributed organisation to more effectively occupy the middle-ground between these two knowledge management strategies, enabling the exchange of rich tacit knowledge - the most compelling advantage of a personalization strategy - at the scale leveraged by a codification strategy. Hansen does warn against "straddling" both approaches, but qualifies this warning by relating it to firms that specialize in a narrow field of work, eg. strategy consultant firms. This warning is then not as relevant to multi-disciplinary organisations, where various strategies might be deployed across different departments. Contrary to Malhotra's lament in 1999 that the rigid, IT-enabled view of KM could not and did not serve the aims of effective knowledge management (Malhotra 1999), and Nissen's complaint in 2002 that "a dearth of information systems is available to enable timely and effective flows [of knowledge]" (Nissen 2002), this researcher contends that with today's tools, ever more tacit knowledge may be captured and reapplied elsewhere in the firm as a KMS not only stores knowledge, but increasingly connects people too.

But what exactly are "Enterprise 2.0" tools? McAfee (2006) defines Enterprise 2.0 as:

*"Enterprise 2.0 is the use of **emergent social software platforms** within companies, or between companies and their partners or customers."*

*"**Social software** enables people to rendezvous, connect or collaborate through computer-mediated communication and to form online communities."*

*"**Platforms** are digital environments in which contributions and interactions are globally visible and persistent over time."*

*"**Emergent** means that the software is freeform, and that it contains mechanisms to let the patterns and structure inherent in people's interactions become visible over time."*

- Andrew McAfee (2006)

The above properties represent critical departures from previous generations of technology. Channels have given way to platforms, and the structure and hierarchy imposed on users of software packages like Sharepoint, are absent in Web 2.0 applications such as Wikipedia. By the popularity of these new tools, it is clear that these characteristics are better suited to the way people generally share information, and thus Enterprise 2.0 represents a huge step forward for achieving genuine management of knowledge in organisations.

The literature focusing on the classic role of ICT in KM reveals two distinct applications (Alavi and Leidner 2001, Ruggles 1998). First is the usual entry, sharing and accessing of explicit knowledge, historically borne out by KMS deployments as "knowledge repositories". Ruggles (1998) notes that while traditional knowledge repository functionality might serve

employees in retrieving “nuggets of corporate wisdom that have been codified”, a great deal of (tacit) knowledge remains in employees’ minds.

Thus, the second application of the KMS is the creation of corporate knowledge directories, or “knowledge maps” (Davenport and Prusak 1998). Brown and Duguid (1991) revealed that employees who share similar work interests will commonly self-organise into a group. The members of these groups perceive value in exchanging information and ideas around their common professional interests. As the “situated learning” (Lave and Wenger 1991) that happens within these communities of practice (CoPs) represents the exchange of rich tacit knowledge (and is thus of considerable value to the firm), a critical function of any KMS is to better facilitate their creation and sustenance by allowing employees with similar interests to easily find each other (particularly across geographical boundaries) and either start new, or join existing, CoPs. Furthermore, KMS could also be used to codify at least some output of the knowledge exchange taking place within those communities. While CoPs may operate around “strong ties”, online knowledge maps may also bring value by allowing the formation of more “weak ties” (Granovetter 1973), especially when information from novel sources is required to solve a problem. Levin and Cross (2004) found “structural benefit” in weak ties, allowing employees to access “non-redundant information” and Hansen (1999) found that weak ties allowed projects to be completed quicker when the knowledge required was not complex. Alavi and Leidner (2001) point out that simple email has been shown to increase weak ties in organisations, and this in turn can contribute to greater knowledge creation as new employee partnerships form and information exchange increases (Nonaka 1994). With engaging, collaborative Web 2.0 and social networking tools integrated into modern KMS, the important KM-related processes outlined above are better facilitated than ever before (McAfee 2009). Benbya and Belbaly (2005) call these KMS “dynamic” and also note that in addition to

facilitating the formation of groups, they also benefit individuals who might only need a single question answered by an expert in another part of the organisation.

One particular aspect of Web 2.0 tools holds specific promise for KM. It is broadly held that humans think in terms of stories and learn effectively from them. Karl Weick wrote in his book *Sensemaking in Organisations* that “people think narratively rather than argumentatively or paradigmatically” (Weick 1995). Swap et al (2001) point out that mentoring and storytelling are key techniques of organisations to transfer knowledge with “rich tacit dimensions”. In the last decade, blogging has become massively popular on the world wide web, with Tapscott and Williams writing in 2006 that “a new blog is created every second, 24 hours a day.” (Tapscott and Williams 2006). Whether for news, entertainment or education, storytelling in digital form has engulfed much of the internet. Most modern KMS implementations include blogging platforms and encouraging blogging in the enterprise may be a key practice of a knowledge management regime that effectively captures and transfers tacit knowledge to re-use across the organisation through this new take on the tradition of storytelling (McAfee 2009).

In conclusion, Alavi and Leidner (2001) write that “Advanced information technologies can be used to systematize, enhance and expedite [...] knowledge management.” Modern ICT systems for use in KM are expected to support and enhance knowledge management processes better than their pre Web 2.0 ilk. To achieve this, however, these systems have to be designed and deployed with an appreciation of the nature of knowledge itself and different types of knowledge in the workplace (Alavi and Leidner 2001). The design and deployment of a KMS should then fit into a broader KM initiative that further includes approaches for managing the processes and practices that underlie creation, sharing and application of organisational knowledge. With this in mind, we turn to the results of the investigation of employees’

perceptions in response to a KMS implementation in the Travel Corporation.

3. Background

The Travel Corporation is one of the world's largest private travel companies with award-winning brands in motorcoach and river touring, independent travel and hospitality. It owns more than 20 travel brands, employs around 4500 people and has offices in North America, UK/ Europe, Asia and Australasia. The following notes provide some context into the environment in which the research was conducted.

3.1 Wiki

In February 2008, the Travel Corporation employed a new Group IT CIO who 'soft-launched' a new wiki product, Atlassian's Confluence, shortly after joining. After deploying the application on to the corporate network, soft-launching involved making the IT department aware of the new application, and allowing a completely organic take-up without a structured roll-out plan or active executive championing, apart from selecting a few IT employees to join a "wiki-champions" group. As this researcher had implemented a wiki for his own team some 2 years prior, all content on the old wiki was converted to the new wiki and thus the new application's take-up for that team was immediately substantial. However, almost 3 ½ years later, "organic" adoption means the wiki has remained the preserve of the IT department and apart from a few exceptions, roll-out to other departments has not yet come about.

3.2 Personal Dashboard project

One exception to the organic roll-out plan was a project designed to introduce employees to the wiki with a personal dashboard, customizable with widgets that pertained to specifically their working context. As this project received senior management support in the form of an executive directive for all employees to set up a personal dashboard on the wiki, this

was many users' initial experience of the wiki application.

3.3 Renewed vigour

In November 2010, frustrated with the lack of progress, this researcher formulated a plan to more systematically drive wiki adoption. The "wiki-champions" group was reformed, including employees in Australia, Canada and the UK. A "lead users" group was also formed, members of which had a lower commitment to the wiki but still displayed "early adopter" behaviour. Upgrades to the software were more frequently rolled out, and the UK Human Resources department was approached to move onto the wiki (this was finally completed in August 2011). While the researcher met with some success, wiki roll-out was retarded by the fact that it was not a full-time focus.

3.4 Portal

The Travel Corporation had previously invested in a Microsoft Sharepoint installation to potentially provide information sharing and management capabilities, named "Portal". However, while this installation had been the official application for Travel Corporation use, users had complained for years about instability and lack of usability of Portal, and efforts to collaborate and share information and knowledge were stymied by the poor technology.

Finally, all but two of the respondents were employed by the organisation throughout the majority of the history of wiki roll-out, meaning that interview data gathered would be drawn on substantial experience of the KMS implementation over its history.

4. Methodology

This dissertation features empirical data collected, analysed and interpreted from interviews and emails about employees' perceptions of a KMS implementation featuring an enterprise wiki product. The literature on the theoretical and empirical investigations into KM and KMS deployment revealed a host of barriers to adoption, or conversely, key success factors to implementation. The purpose of this exploratory study was to gain insight into what may retard the implementation of a wiki product as a KMS in a multi-national, multi-disciplinary organisation as interpreted from employees' perceptions.

4.1 Data Collection

The research question of this paper makes it necessary to focus on employees' perceptions of the wiki as its use slowly spread to a handful of teams in the organisation, mainly in the IT department. Purposive or theoretical sampling was used to select employees that were:

- Frequent contributors, regardless of any official role regarding wiki roll-out
- Those with an official role, regardless of their number of contributions
- Those who had demonstrated resistance to using the wiki in the past

Frequent contributors were defined as being consistently in the top 5 contributors (by number of wiki edits) over June, July and August 2011. Confluence records this activity automatically and so a report was drawn (see example in Appendix B) to provide a selection of employees from which the researcher selected certain individuals based on considerations of accessibility (some employees were simply too busy to interview). Employees with an official role were sampled from the Wiki Champions and Wiki Lead Users groups. Two employees who

had demonstrated resistance when directed to use the wiki were chosen to interview, in an attempt to gain further insight into barriers to wiki usage.

Interviews were in-depth and semi-structured, and took place over video-conferences, through telephone calls and in-person. Employees from the UK, Australia and Canada were included to account for perceptions possibly differing by region (for eg. as a result of miscommunication or cultural diversity). All interviews lasted between 40 and 60 minutes and the audio was recorded and later transcribed for coding purposes. In total, 9 interviews were conducted, and one further respondent answered the questions over email.

Finally, 11 emails collected over the course of 8 months that covered wiki roll-out issues were also captured as data.

4.2 Analysis

The interview transcriptions were imported into qualitative data analysis software application NVIVO 9 as data sources. All text was then analysed inductively and qualitatively by open-coding the data over multiple readings to find emergent themes in the data, adhering to the grounded theory traditions as laid out by Collis and Hussey (2009). As the researcher was more than likely, perhaps even subconsciously, made more sensitive to certain themes by conducting the literature review of key success factors for KM and KMS implementation before data collection and analysis, special care and consideration was used to be sensitive to themes not necessarily outlined in the literature.

After open-coding revealed more than 100 codes in the data, axial coding was used in an attempt to group or aggregate codes into categories or themes. In three instances, these themes were then able to be aligned with the critical success factors for KM outlined earlier. In

two other cases, themes emerged that appeared altogether novel. This resulted in five major and distinct themes of employees' perceptions, referenced by most if not all respondents. These were perceived utility, usability, senior management support, the lack of a structure or information architecture in the wiki application, and vision-creation and clear communication regarding the KMS implementation. A sixth distinct but less substantiated theme was also uncovered. This was related to resourcing for KM practices, or what Davenport and Prusak (1998) call "organisational infrastructure". This theme was not considered major as only a handful of respondents had strong opinions on it, and most were ambivalent when asked specifically about the issue. Finally, several smaller issues were uncovered, and treated in the discussion that follows for completeness, as the small sample size of the study may have obfuscated how impactful these issues may have been in the KMS implementation.

As the research was conducted at a time when wiki use was comparatively immature and embryonic, one possible limitation of the study is that only issues related to initial stages of wiki roll-out were uncovered. Further research into wiki deployments that have come much closer to "critical mass" might uncover further issues or nuances regarding employees' perceptions in a KMS roll-out.

Finally, as the study was exploratory, the conclusions drawn, as they relate to each area problematic in the KMS roll-out, should be regarded as hypotheses only and not proven.

5. Results & Discussion

After invention by computer programmer Ward Cunningham in the mid 1990's, the concept of a wiki was brought mass attention by the advent of Wikipedia, and the respondents in this study were no different. All had an awareness of the online encyclopedia and most were regular users.

> *"As a long term user of Wikipedia as most people are in this industry [IT] I immediately saw some benefits. I remember being very excited to find out what it had in store and what we could use it for in TTC [The Travel Corporation]."*

> *"Well, yeah, I mean it's Wikipedia. I was familiar with Wikipedia so I got the concept that it was holding information, one, that we could share with others, but also [two,] that I needed."*

This at least means that the concept of co-editing pages on website with other people was not completely foreign. However, in making sense of this tool in an organisational setting, the users interviewed demonstrated reactions in several areas that would need to be addressed more systematically in this and any KMS implementation, with some of them possibly specific to a wiki product. Obvious differences in employees' use of Wikipedia vs their enterprise wiki include the level of content creation (the overwhelming majority of Wikipedia users only read content) and issues of controlling access to content, among others. The following sections expand on the major themes extricated from the data, with the final section treating a collection of more minor issues relevant to the study. Where relevant, these sections draw from one or more critical success factors for KM discussed in the literature review above.

5.1 Perceived Utility

Several respondents, when asked what they think hindered adoption of the wiki, cited the importance of employees first and foremost understanding the benefits of using the wiki in their day-to-day jobs.

> *“Thing is, it [using the wiki] isn't that difficult. These are tech people. [...] I think the two things are, one, is that, they think they don't know how to use it when they do. [...]. And, two, they don't see the benefit from it.”*

> *“So, I think it will just take time, but maybe, I don't know, have some info about how it could be used, you know, how it could benefit.”*

> *“The most important thing is telling them how it will benefit them, like what's in it for them.”*

> *“See, people should first appreciate and get hooked onto wiki. They have to see the benefits and the difference in working differently.“*

> *“Having said that I think people can navigate very easily and they can search for things very easily, it's just a matter of convincing people that your job could be easier, if you just put more time into it.”*

Furthermore, while there may have been a general lack of communication regarding potential benefits of general wiki use, in some instances employees pointed to an acute absence of any such communication. When the Personal Dashboard project was rolled out, and along with it an executive directive to all employees to create a dashboard, one respondent recounted:

"... the main benefits of why you should use it weren't sold. No-one said 'Do this because this is how you're going to benefit' it was 'Do this because I'm telling you to do it'. That's what I remember it being like. And no-one...I think I had to actually go down to [Dashboards project manager] and say 'What is the benefit, Why are we doing this?'"

It also emerged that it wasn't just the rank-and-file employees that were lacking information on the usefulness, but also senior management. When asked whether he had seen any activity on the wiki from senior management in his region, one respondent answered:

"Yes and no. I've had a few, for eg. [brand] - their senior managers have their meeting minutes on there, and a bit of light project communication on the wiki. My boss, [...] uses it to monitor me basically. The MDs for the brands, I think they're...I don't know, they haven't really seen the benefit yet that makes them want to get involved."

And when asked later in the interview whether senior management involvement was important to wiki adoption, the same respondent offered that the benefits need to be sold to managers too.

"I think it's probably important to get them involved. But to do that we do need to hit them with the benefits. I think the benefits are there - whether we can communicate them or not is the question."

It was clear that some respondents were also outright unaware of some of the wiki's core features. This respondent was unaware that certain content, in this case meeting minutes, could be made visible only to selected users.

“But the wiki wasn't really the best place for them [meeting minutes] either, so now they're not stored at all [...] Because you don't necessarily want to share everything from that meeting with every other office. Like a lot of stuff is fine, but some stuff that comes up is [...] it should stay in our office.”

Some respondents also spoke about the lack of useful, relevant content on the wiki lowering its perceived utility.

“If it [the wiki] is brand new...how useful would Facebook be if only 2 people were on it? How useful would Google be if it only searched 4 websites. The information has to be there [on the wiki]. This is the tricky part because the resource-need has to be there before the people provide the resources. You want them to contribute first, but then you want people to use it before they contribute. [...] I think that's really the main problem, is having the needed information on there.”

Furthermore, a few respondents suggested that having well-structured, rich example content would educate browsers in what could be achieved, motivating more employees to participate.

“[Creating good content] requires that people are educated, and more than just pointing them to some YouTube videos. There need to be some specific examples of perfectly laid out, tagged, and commented pages, that they can see. At least, that’s what I’d want to see if I was a user.”

While some users were ignorant of some of the wiki’s features, most were found to be knowledgeable of the benefits of the wiki, citing automatic document versioning, improved communication with other employees, less email overload, document storage facilities and retained knowledge in the face of staff turnover among the many reasons they found the wiki

useful. Some even used it as their own project management and primary document creation solution, foregoing collaboration-oriented features altogether. However, it would appear that the benefits of managing knowledge using a wiki need to be communicated vividly, on a continuous basis and at multiple levels of seniority. Employees need to be educated as to how using the wiki can benefit their working lives by providing improved ways of working with colleagues, including the benefits of features like permission controls. In addition, users must be able to access useful, relevant content to further raise the wiki's perceived utility at the outset, as well as having access to good quality example content that illustrates what is achievable in the KMS. In marked contrast to internet communities like Wikipedia, for mass adoption in the enterprise, a KM initiative cannot rely on employees "self-discovering" the utility of the wiki, as most of our respondents did. Interestingly, this was a theme of the data the attention of which afforded by the literature is light. Wu and Wang (2006) found that "perceived KMS benefits" did positively influence KMS use, but there is an opportunity for more research in this area.

5.2 Usability

If respondents did not cite perceived utility as the biggest barrier to wiki adoption, they usually pointed to the poor usability of the tool and the poor user experience in adding and editing wiki pages. It emerged that this was particularly acute in first-use scenarios because of a lack of any training workshops or tutorials that could educate new users about the mechanics of contributing content.

Historically, the use of wiki products has necessitated users having to learn a form of markup language, or syntax, to apply style and formatting to a page. Employees in an organisation would typically be using enterprise wikis on a voluntary basis, and the majority are not typically in the technology-aware or early-adopter demographic.

“The other thing is we didn't get any teachings on using the markup language, which might be easy for a developer, but for me, making a table or doing something in Excel or Word and keeping it updated is easy. Making it in a wiki page and then trying to update it isn't so easy. So it seems like you're doing things doubly.”

For these reasons, although the markup language can be learned, a KMS implementation in the enterprise appears destined to suffer in terms of adoption if it intends to rely on users learning a new formatting language in order to feel comfortable and productive with the tool.

When in edit mode, Confluence displays one of two editing boxes in which the user may choose between. One is a wiki markup box, where users are expected to enter markup text as mentioned above. The other is a rich-text box, including a toolbar displaying buttons for bold, italics, justification, inserting links and images, etc. similar to what a user would find in MS Office. While preferable to most users over the wiki markup box, some also reported drawbacks to using the rich-text box to manage content, including the loss of formatting (a problem noted by creators Atlassian) and the lack of certain features, for eg. merging table cells.

“There's some things that the Rich Text box doesn't do very well and I find you have to learn some markup to really get the full functionality.”

“The wiki roll-out was pretty difficult for our office, especially because trying to add things can be difficult. Because you have to use the html language right? You've gotta add stuff...that's the part where people get stuck.”

“It's a fairly basic feature-rich text editor. There are some things it can't do, like for example, tables are a bit odd with it. If you want to merge cells for example, you can't do it very well. I even created a document in my personal space on how to create merged cells, but in the end you're pretty much just doing HTML editing, and that just defeats the purpose of having an editor in the website.”

A subtle theme uncovered in the data revealed that the wiki was often judged to be of “poor usability” when specifically compared against tools that have occupied the enterprise for years, for example, Microsoft Office products. Notwithstanding the actual technical shortcomings reported above of the product itself, this also might allude to users’ perceptions of a product being of poor usability only because they are not used to working in the entirely new ways that modern collaboration tools prompt them to, ie. creating rich content in an internet browser (McAfee 2009). At the very least, this might mean that a KMS that featured rich integration with the tools that employees already use, would be regarded by those employees as having better usability. At best, this perception of “poor usability” might just be an initial hurdle in learning a new tool, and overcome fairly easily with a bit of tool training and management push.

Interestingly, two respondents who can be regarded as “tech-savvy” or early adopters, did report on how easy they thought it was to start using the wiki in basic ways. While they were in the minority, it could be speculated that at least some of the barriers regarding usability of the wiki could be overcome by simply increasing users’ motivation to get started with the basic wiki functionality, targeting other types of adoption barriers to do this. One the other hand, it could be argued that it is implausible that users would be satisfied for very long only using the basic functionality of a wiki, when they are usually capable of producing richer content in other applications.

Atlassian have pointed out that a poor editing experience, including having to use wiki-markup to gain access to superior formatting features, has been a major part of feedback on the Confluence product over the last few years. Consequently, in a major upgrade of the software released in September 2011, the rich-text box and the wiki markup box have been replaced by one much improved near-WYSIWYG editor, effectively rendering concept of wiki-markup invisible to the end users, though it remains available to use for more technical users who have learned it. Consequently, this is one barrier to the adoption of KM practices that can be argued to have its solution in the evolving technology, rather than users' perceptions or behaviour.

5.3 Senior Management Support

Consistent with the case study research in the literature (Davenport and Prusak 1998), as well as the advice from management consultants (McAfee 2009), the lack of support of senior management was outlined by the majority of respondents as one of the more grievous inhibitors to broader wiki adoption. One employee tasked with official roll-out duties lamented:

> *"It's not a high priority, there's much more pressing items that they want to get done first. It feels like it's been put down to the bottom of the list, which is disappointing..."*

Another, when asked whether management support is needed, suggested:

> *"I think so, because without them we can't get resources dedicated to adding to the content to the site. Whether it's with a dedicated team, or they push down to middle management which then pushes down to [...] to non-management."*

But senior management support cannot just be in the form of a directive to use the wiki.

“You know, I think it's got a good future depending on how we go with it really. [The CEO] telling us to use it isn't going to work, it didn't work last time.”

Instead, senior managers have to become an integral part of the KM initiative, engaging in behaviours that legitimise the KMS and are exemplary of its use and usefulness. Respondents seemed to perceive value when the CEO started posting his monthly updates on the wiki, having previously used the Sharepoint facility (Portal).

“I thought it was good that he highlighted a few positive things about the company. [...] so it was nice that he actually said...so and so's got married, so n so's leaving. People appreciate a personal touch, even if it's on the wiki it's still nice. And seeing the new Uniworld boats, it's nice to see pictures without having to go somewhere else and see them.”

“I think it's a good medium for him to use for that sort've thing [...] I think the fact that he using it is a big step and it's important to get that buy-in from senior management.”

And those on the roll-out team did think that this would help the KM initiative itself:

“I really thought ‘Thank goodness our CEO is using the wiki’ and I was hoping it was going to be more of a driving force behind using the wiki. Because I really think the example and tone of using the wiki needs to start with him, and come down. If it doesn't, I don't think it's ever going to roll out very well, or roll out properly [...]So it was better to see his updates on the wiki, and was nice to see him moving over there, I really thought it was going to help our roll out plan as well.”

Unfortunately, at that time, this was the full extent of executive activity on the wiki, and not enough to convince all those interviewed. When asked if the CEO's updates now appearing on the wiki changed his opinion of the wiki, one respondent replied apathetically:

> *"Not really, it was coming as a PDF or email before. Now it's there [on the wiki]. At the end of the day you are sharing information, how you are sharing it doesn't really bother us [...] yes it's a senior management update [but] you could've got it in an email or a letter. It doesn't really matter which way you get it - as long as you get the information."*

Nevertheless, it is not implausible in this case, based on the research literature, that if more executives did begin to blog their periodic updates on the wiki, this would increase public interest in the KMS and better communicate that the wiki would become the de facto standard for communication. Senior management support is a commonly cited critical success factor in the literature and the theory is justified out in this study.

5.4 Structure

Another of the key barriers highlighted by respondents was one particularly unique to the wiki paradigm. Ward Cunningham created the wiki as a simple text-based, editable web page - "The simplest online database that could possibly work" (Cunningham 2011), and the concept has remained largely the same since that first inception. Structuring mechanisms took on an emergent property. For example, Wikipedia pages with a small amount of content will not usually display a table of contents. As a page gets longer, it has a higher chance of having one created, as content is organised and re-organised into various sections. This property has been taken forward into most Web 2.0 tools recently developed, as McAfee (2006) explains:

"...the technologists of Enterprise 2.0 are trying hard not to impose on users any preconceived notions about how work should proceed or how output should be categorised or structured. Instead, they're building tools that let these aspects of knowledge work emerge."

While this *tabula rasa* convention might be a wiki's unique selling point, it does tend to lead to confusion in users, especially those most used to working within a pre-defined structure the like of which is found in many first-generation KM tools.

"And structuring it is the other problem...it's easy for it to get a bit messy. You know where do you create a page from, how do you do it?"

"I think at the end of the day it is just the structure that is lacking. Conceptually it is very good because of the transparency. If you want to share more information about what we are actually doing then we have to create, actively create a structure. Once that structure is created, then things will fall into place."

"There has to be a common, [...] a standard template. People are not first and foremost very comfortable with going and clicking all the links and finding out where things are. So, almost like a website, if you have sitemap saying 'Yes, this is what this whole thing is, this is where information is, this is how it is structured.' Then they will know, 'yes, I can go and find my information here'."

Stewart Mader, in his book *WikiPatterns* - a collection of techniques to drive wiki adoption in the enterprise - cites a specific pattern called "Scaffolding" (Mader 2007) to overcome this barrier. Using this technique, a wiki user would create a scaffold, for eg. a list of headings, before handing the page over to a newer user, who would then be encouraged to flesh out the content. Mader's (2007) justification is that "People often respond better to a page

with a template than one that's completely empty.”

However, even creating a few pages in an attempt to lay out some structure can have adverse effects on perceptions. One respondent had this reaction after a manager had attempted to create some pages representing an initial structure.

> *“I guess one problem I had when contributing content early on was that I didn't know where to put stuff. It looked like it was sort of “Under Construction”. Even our Toronto Data Centre area...it looked like we'd just created a page for the sake of adding a placeholder. And that was just to fill up room, a structure for what they thought was going to be the structure for that area. So I didn't want to go in and be the first contributor either, you get that weird hesitation - Is this right place? Do we have any place else? Who can see this? What format should we be using?”*

As Wikipedia seems to have succeeded with only basic structuring mechanisms and conventions, it may be speculated that this problem is unique to enterprise wikis. Enterprise projects, from new product and service developments to IT-upgrade projects, may well exhibit much richer complexity that is not represented satisfactorily with simple text and pictures in a flat page hierarchy. Recent research has experimented with a “visual approach” to wiki navigation (Hirsch et al. 2010), where users may see a graphical representation of the network node that the current page represents in a left pane of an application, while in the right pane the page content itself is displayed (see “ThinkBase” VisualWiki in Appendix C).

Finally, it was apparent from the data that by and large, users do not currently have the expertise or confidence to create structure where there is none (most of our respondents were an exception to this) . Consequently, a KMS roll-out plan would have to include mechanisms to aid users in overcoming this barrier, for example, providing training and workshops to educate

users to create structure, or perhaps providing dedicated personnel knowledgeable about the wiki product, to collaborate with various managers in setting up the structure for their teams. The lack of structure, or information architecture, in a KMS has not been extensively covered in the literature and can be considered to be another area for additional research.

5.5 Vision-creation and Communication

Any organisational change program needs certain “program management” elements to it. These include vision-creation, good communication of objectives and timelines, and detailed plans of action. Without these elements, a change initiative can quickly lose momentum and fizzle out. As a number of respondents were tasked with assisting with the wiki roll-out, the data revealed a high sensitivity to the lack of a clear and coherent plan to assist them.

> *“I felt it wasn’t enforced enough and didn’t have a clear direction.”*

Absent too was information on the vision for the tool itself (emphasis added):

> *“I think as long as we can get our roll-out plan put together and organised really well and have a really firm plan on **how we want it used in the company**, I think it can be a fantastic tool.”*

> *“...but hopefully it would have more structure to it, and more guidelines. So is it a configuration database where your current documents are? Is it your glossary? And how do you differentiate between the two, as it were. And who's responsible for maintaining it. When people make a page then who controls it...or does it just sit there forever?*

It emerged that communication as to the vision for the KMS was especially needed as users were sensitive to the myriad of tools confronting them in the workplace.

> *"...we've got too many systems that do similar things. We've got SimplyPersonnel, which is a personnel thing, we've got TTCSupport [helpdesk system], we've got the wiki [...] we've got JIRA [issue tracking system]"*

> *"And you kind of have to memorize where things are located. So if someone is new to the information, like a new hire, they would have a very difficult time trying to find out what resource they're supposed to use. Especially when you have it scattered across all these different systems...public folders, network shares, now the wiki and we've got the Portal. Four places people can look for information."*

> *"Yes we used it [Portal] to get all the forms and other stuff. And there used to be updates on the Portal anyway. So you have the Portal, you have JIRA, so why do you need wiki?"*

One employee raised similar concerns in an email.

> *"To me, it doesn't seem like there's any clear direction for the Wiki. I don't mean this as a slight to anyone, especially you, who is putting a lot of time and effort into it. From my perspective, it seems as the Wiki is being rushed into production before all things have been clearly thought through. We are getting people to start using it and creating pages, without giving them any proper direction on how to do it, or why it's any different than the portal."*

Because users were not educated on what a wiki is and what problems it solved, they could not make sense of where it was situated in their corporate toolkit, and this obviously retarded adoption and use. It was made clear that the wiki was replacing Portal, but this solution

was not much used anyway, so most users could still not see how it integrated into their day-to-day work.

Thus, any KMS implementation must take care to clearly outline what the KM tool is, how it is intended to be used, and its place among other tools already present in the organisation.

5.6 Organisational Infrastructure

Benbya and Belbaly (2005) write of “structural mechanisms” in their analysis of successful KMS implementations, next to cultural and managerial mechanisms and can range from appointing a steering committee to the implementation of a separate organizational unit responsible for knowledge management, such as the ‘Knowledge transfer department’ in Buckman Laboratories. Respondents were somewhat divided on the robustness of organisational structure that was required to fully resource the KM initiative. Some respondents thought full-time resources were crucial. For example, one respondent alluded to what the literature would call a “knowledge champion” (Davenport and Prusak 1998).

> *“It could work if you actually, if your job was to get the wiki working, I think you could do it. If there were a team of people with like one person from each place, each major team...but it would have to be led by a person I think, because a group won't do it.”*

> *“...trying to get it rolled out has been difficult and having someone dedicated would definitely mean we could put a lot more time and energy into it.”*

“I believe in order to get more users to use the wiki there has to be a key individual (Wiki Leader/ Master) that is very knowledgeable about the wiki and understands it completely. From there, the Wiki Lead should promote and gradually train others to start using the software.”

Another disagreed with the suggestion, but then promptly revealed one of the main reasons why dedicated resources might be needed!

“You don't have to be on it full time. You just have to spend 10/15 minutes...half an hour, 1 hour, with people who find it difficult to use wiki, and spend some time with them and they will get onto it.”

As the above respondent was not part of the roll-out team, this researcher contends that those with more visibility of the roll-out, and thus more experience of the effort required, would be more likely to recognise the need for dedicated resources.

The suggestions for dedicated resources would agree with research like that of Ruggles (1998) who found “that over half the executives in that study felt that having a Chief Knowledge Office (CKO) would be at least somewhat valuable in their organisations”. Other roles Ruggles found in organisations included knowledge engineers, navigators, brokers and stewards who were responsible for duties such as repository management, coaching knowledge behaviours and facilitation of knowledge transfer.

One respondent recounted having had dedicated resources at a previous workplace, IBM.

“I had a knowledge-base when I was working at an IBM call-centre. We had one person that was pretty much full-time supposed to be assisting with managing the content. But also we had another full-time person pretty much exclusively wrote very specific documents for it.”

Other respondents drew attention to the importance of having a team.

“I think you need a close partnership...a good technical team á la you and me and some of the other personalities we have in the [roll-out] team. I think you need that team to work closely with a selection of senior management, it doesn't hurt if they're tech savvy as well.”

Respondents were highlighting the obstacle of organisational structure in direct response to a perceived failure in getting the wiki rolled out successfully. Thus, the data collected in this study reflects the prevailing view that at least some kind of dedicated resources are required to facilitate a successful KM initiative. It cannot be limited to the part-time focus of several employees. As Davenport and Prusak (1998) put it, “Knowledge management will not succeed if there are no workers and managers whose primary jobs involve extracting and editing knowledge from those who have it, facilitating knowledge networks, and setting up and managing knowledge technology infrastructures.” In this aspect, employee perceptions were congruent with the key success factors to be found in the mainstream KM literature.

A KM-friendly infrastructure also includes reward and motivation mechanisms that promote behaviours resulting in increased wiki awareness and use.

One respondent suggested this idea specifically:

“Or if let's say you're a call-centre and you have available time...and you know there's content that is important, then add it [to the wiki]. Not necessarily like ‘You have to do it.’ but at the same time if you do contribute that you can be recognized in some way [...] I think that would really help. I mean especially if it’s not [...] like "You have to do this" it's more of a "If you want to contribute more, here's a way that you can do that." Then if you reward that behaviour [...] you may get more people contributing as well. You just have to start! ”

As mentioned before, wiki-use in an organisation is likely to be on a largely voluntary basis. For this reason it is critical to implement incentives that encourage knowledge-sharing behaviour, and especially at the outset when exemplar use of the KMS may otherwise be few and far between.

In promoting their launch onto the wiki, whereby all HR content was made accessible in a “Human Resources - UK” wiki space, HR personnel embedded instructions on how to win an Amazon gift voucher in one of the pages. Soon after, the entire department received the following email:

Good morning everyone

I am delighted to announce that the following people were first to find our hidden core beliefs and values in the HR area of the Wiki:

[list of employee names]

Congratulations! You will all receive a £10 Amazon gift voucher in your inboxes shortly.

Don’t forget to keep an eye on the Wiki – you never know, we may plant more surprises in there!

Kind regards,

The HR Team

Rewards of this nature serve a dual-purpose. Firstly, as suggested by the literature (Davenport and Prusak 1998) the organisation is signalling that awareness of the wiki is important, and browsing it is not only condoned but encouraged. Secondly, it seemed to inspire curiosity which then led to further education as to the utility of the wiki, in this case HR.

"I wanted to see what the fuss was about...what is on there exactly. And so then I saw the huge list of [HR] policies and forms available...now on the wiki."

Thus, the data suggests that incentives based on behaviour of accessing, sharing and reusing knowledge are a key part of any KMS implementation, and is consistent with the literature outlining key success factors for KM.

5.7 Smaller Issues

While there were a few recurring themes present in the data, there were also several smaller issues uncovered. Due to the relatively small sample size of this study, it is difficult to ascertain the importance of these issues in the greater context of a KMS implementation relative to those outlined above, and thus what level of threat they represent to a successful KM initiative. Regardless, they are covered here for reasons of completeness and interest.

Interestingly, when respondents were asked to comment on what they felt was the future of the wiki, most said they expected nothing much to change, and that it would continue to flounder. Some even said it would remain exclusively a "tool used within IT". However, the

end of the interview was normally characterized by a certain optimism for the wiki's future (albeit subject to certain conditions, like a strengthened roll-out plan or better management). This indicated that although they could clearly perceive of the wiki's utility, they did not trust their colleagues to perceive it in the same way, and this ultimately retarded wiki use by some of the respondents themselves. Consequently, it is proposed that the more the organisation encourages not only more actual use of the wiki, but also continuously cultivates *the perception that the wiki is being widely used*, Metcalfe's law (the notion that a network's value increases as the number of nodes increase) will result in employees' attributing more perceived value to the wiki than what would otherwise be the case, thus aiding adoption.

This notion was also demonstrated from another perspective. Several respondents reported that they were introduced to the wiki very soon after starting with the company. It emerged that in all cases, these employees had, to a lesser or greater degree, continued to use the wiki in various ways after that early introduction, exhibiting above-average levels of use. Again, if someone is led to believe that the wiki is the de facto standard for collaboration, documentation, project management, etc. even if this is only half-true (a new starter is usually impressionable in this way), they will experience a higher motivation to use the wiki, and this would greatly help adoption.

Another issue uncovered through the analysis of the data was importance of wiki use being driven from "offline". In a KMS implementation of this nature it is all too tempting to focus on what information is and is not on the wiki, who is using the wiki and in what ways, how user-friendly the tools are, etc. However, when users are, as one respondent put it, "not sure if there is anything interesting on the wiki", this can be partly due to the fact that this employee has not heard anyone in the office say, "It's on the wiki" or "Go look in the wiki" in response to any

questions that employee has. Nor has he or she seen any presentations where the presenter has concluded with “My presentation is available on the wiki for those interested.” or received emails with links to new, relevant and useful information on the wiki. A certain segment of employees will experience increased motivation by browsing the wiki and interacting in its community. However, provision needs to be made, especially in the embryonic stages of the roll-out, to champion wiki use *offline* as much as online, as public “real-world” reminders may be powerful ways to cultivate wiki awareness among staff. Employees need to be talking face-to-face about what is on the wiki and where, in order for its use to flourish.

When the majority of users are using one specific way to do their work, which is inferior to working with a wiki, it makes sense to discover what the method is, and specifically target education and guidance to employees around the shortcomings of that method and the specific benefits that a wiki brings over the old way of working. In this study, it emerged that “network drives” containing shared files is the most common way to share information and used by many employees in the organisation. Outlining exactly why this is an inferior way to work (in this case examples of shortcomings are the inability to search, no version history, inferior information architecture, etc) and how exactly to achieve the same goals using the wiki, would benefit the KM program immensely.

The final smaller theme uncovered in discussions was the idea of partly contextualising the KM initiative around certain departments (for eg. call-centres) or roles (for eg. brand presidents). While a laundry list of generic benefits such as automatic document versioning and connecting with colleagues across the globe might intrigue many employees, outlining more specific use cases related to specialized functions or roles could possibly be a more enticing way of “selling” knowledge management practices across the enterprise. The public reporting of

success stories of these “KM onboarding” episodes could well contribute to the success of KM more widely. Contextualizing KM for each department or role in this fashion would leverage from the work of Nissen (2000) outlined earlier, where initially, business processes themselves are analyzed, and supportive KM processes then defined accordingly.

6. Conclusion

This study revealed a range of employees' perceptions to the deployment of a wiki-based enterprise application as part of a broader KM initiative. The major barriers to wider adoption that emerged were a lack perceived utility of the product, poor usability when interacting with the application, a lack senior management support for the broader initiative (in not only visibly supporting those championing the initiative but also engaging in knowledge-friendly behaviours themselves), a lack of structure or information architecture present in the KMS, a lack of clarity and communication as to the projects aims and methods, and finally insufficient "organisational infrastructure" or staff resources dedicated to the KM initiative. This research is useful as it points specifically to areas that need to be targeted for a KM initiative that is supported by a wiki-based KMS to succeed in and for the organisation. Clearly, these things matter to the people whose behaviour organisations would ostensibly like to change as a means to better managing their knowledge. Organisations, then, have a duty to develop techniques to effectively communicate to, motivate, educate, support and reward employees in taking on new behaviours supportive of improved management of organisational knowledge. Triaging the pain points highlighted in this study will afford a greater competency in KM for the organisation, ultimately leading to improved competitive advantage.

References

Alvesson, M., 1993. Organizations as Rhetoric: Knowledge-intensive Firms and the Struggle with Ambiguity. *Journal of Management Studies*, 30(6), pp.997-1015.

Alvesson, M., Kärreman, D. & Swan, J., 2002. Departures from Knowledge and/or Management in Knowledge Management. *Management Communication Quarterly*, 16(2), pp.282 -291.

Argote, L. & Ingram, P., 2000. Knowledge Transfer: A Basis for Competitive Advantage in Firms. *Organizational behavior and human decision processes*, 82(1), pp.150–169.

Benbya, H. & Belbaly, N.A., 2005. Mechanisms for Knowledge Management Systems Effectiveness: An Exploratory Analysis. *SSRN eLibrary*. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1652512 [Accessed September 22, 2011].

Blackler, F., 1995. Knowledge, Knowledge Work and Organizations: An Overview and Interpretation.

Brown, J.S. & Duguid, P., 1991. Organizational Learning and Communities-of-Practice: Toward a Unified View of Working, Learning, and Innovation. *Organization Science*, 2(1), pp.40-57.

Collis, J. & Hussey, R., 2009. *Business Research: A Practical Guide for Undergraduate and Postgraduate Students* 3rd ed., Palgrave Macmillan.

Cunningham, W., Wiki: What Is Wiki. Available at: http://www.wiki.org/wiki.cgi?WhatIsWiki [Accessed September 17, 2011].

Davenport, T.H., 2005. *Thinking For A Living: How to Get Better Performance and Results From Knowledge Workers*, Harvard Business Press.

Teece, D.J., 2000. Strategies for Managing Knowledge Assets: the Role of Firm Structure and Industrial Context. *Long Range Planning*, 33(1), pp.35-54.

Granovetter, M.S., 1973. The strength of weak ties. *American journal of sociology*, pp.1360–1380.

Grant, R.M., 1996. Toward a knowledge-based theory of the firm. *Strategic management journal*, 17, pp.109–122.

Gupta, A.K. & Govindarajan, V., 2000. Knowledge management's social dimension: lessons from Nucor Steel. *Sloan Management Review*, 42(1), pp.71–80.

Hansen, M., Nohria, N. & Tierney, T., 1999. What's your strategy for managing knowledge? *Harvard Business Review*, 77(2).

Hasanali, F., 2004. Critical success factors of knowledge management. *Knowledge Management. Lessons Learned..., ASIST Monograph Series, Information Today, Medford, NJ*, pp.55–69.

Hirsch, C. et al., 2010. ThinkFree: using a visual Wiki for IT knowledge management in a tertiary institution. In *Proceedings of the 6th International Symposium on Wikis and Open Collaboration*. p. 7.

Holowetzki, A., 2002. *The Relationship Between Knowledge Management and Organisational Culture*.

Lave, J. & Wenger, E., 1991. *Situated learning: Legitimate peripheral participation*, Cambridge Univ Pr.

Levin, D.Z. & Cross, R., 2004. The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management science*, pp.1477–1490.

Mader, S., 2007. *Wikipatterns* 1st ed., Wiley.

Malhotra, Y., 1999. Beyond “Hi-Tech Hidebound” Knowledge Management: Strategic Information Systems for the New World of Business. *Knowledge Management*, 2(1), pp.18–21.

Mason, D. & Pauleen, D.J., 2003. Perceptions of knowledge management: A qualitative analysis. *Journal of Knowledge Management*, 7(4), pp.38–48.

McAfee, A.P., Enterprise 2.0, version 2.0. Available at: http://andrewmcafee.org/2006/05/enterprise_20_version_20/ [Accessed September 4, 2011].

McAfee, A.P., 2006. Enterprise 2.0: The dawn of emergent collaboration. *Engineering Management Review, IEEE*, 34(3), pp.38–38.

McAfee, A.P., 2009. How Web 2.0 is changing the way we work Andrew McAfee - McKinsey Quarterly - Business Technology - Strategy. Available at: http://www.mckinseyquarterly.com/How_Web_2_0_is_changing_the_way_we_work_An_interview_with_MITs_Andrew_McAfee_2468 [Accessed September 13, 2011].

Nissen, M., Kamel, M. & Sengupta, K., 2000. Integrated analysis and design of knowledge systems and processes. *Knowledge Management and Virtual Organizations*, 1, pp.214–244.

Nissen, M.E., 2002. An Extended Model of Knowledge-Flow Dynamics. *Communications of the Association for Information Systems*, 8(1). Available at: http://aisel.aisnet.org/cais/vol8/iss1/18.

Nonaka, I., 1994. A Dynamic Theory of Organizational Knowledge Creation. *Organization Science*, 5(1), pp.14-37.

Nonaka, I.A. & Takeuchi, H.A., 1995. *The knowledge-creating company: How Japanese companies create the dynamics of innovation*, Oxford university press.

Polanyi, M., 1966. The tacit dimension. *New York*.

Ruggles, R., 1998. The State of the Notion: Knowledge Management in Practice. *California Management Review*, 40(3), pp.80–89.

Schreiber, G., 2000. *Knowledge Engineering and Management: The CommonKADS Methodology*, MIT Press.

Starbuck, W.H., 1992. Learning by Knowledge-intensive Firms. *Journal of Management Studies*, 29(6), pp.713-740.

Storey, J. & Quintas, P., 2000. *Human Resource Management: A Critical Text* 2nd ed., Thomson Learning.

Swap, W. et al., 2001. Using mentoring and storytelling to transfer knowledge in the workplace. *Journal of management information systems*, 18(1), pp.95–114.

Tapscott, D. & Williams, A.D., 2006. *Wikinomics: How Mass Collaboration Changes Everything* First., Portfolio.

Weick, K.E., 1995. *Sensemaking in Organizations*, Sage Publications, Inc.

Wenger, E., 1998. *Communities of practice: Learning, meaning, and identity*, Cambridge Univ Pr.

Wenger, E., McDermott, R.A. & Snyder, W., 2002. *Cultivating communities of practice: A guide to managing knowledge*, Harvard Business Press.

Wu, J. & Wang, Y., 2006. Measuring KMS success: A respecification of the DeLone and McLean’s model. *Information & Management*, 43, pp.728-739.

Yahya, S. & Goh, W.K., 2002. Managing human resources toward achieving knowledge management. *Journal of Knowledge Management*, 6(5), pp.457–468.

Appendices

Appendix A: Interview Guide Template

General:

- Can you remember how you first heard about or came into contact with the wiki? What did you first think of the idea?
- Can you remember when you then first contributed to the wiki? What happened between these two events? (Why did it take so long etc) What made you do it or try it out?
- Do you think the travel corporation can benefit from a wiki? Do you have any ideas of how it may benefit?
- What is the main thing that stops it doing so do you think?
- What do you think the company should do to get more people using it?
- Do you ever simply browse around the wiki? Why / why not?
- How do you search for information at the moment? For eg. Ride2Work scheme - Email HR? Portal?
- Is there anything you think the wiki would be bad at doing? Or is bad at doing now?

Executive signalling:

- Have you seen Brett's updates as a blog on the wiki? Did that make you think any differently about the wiki?
- What about other exec managers? What do you think they think of the wiki and how does that make you feel?
- Who's responsibility do you think it is to drive wiki adoption and to manage it's rollout and administration?

Individual motivation:

- Has the wiki been useful to you?
- Do you know of any situations where your content has been useful to others? Would you say this affects your use of the wiki in any way?
- Would you say there is a high/medium/low activity on the wiki? Would you say that has affected your usage of it?
- Has using the wiki made your work easier to do?
- Do you have anybody that have you talked to about content that you have added to the wiki? Collaborate with anyone? Someone asked you about it? What effect does this have?

Implementation:

- What do you think may happen to the wiki over the next say 6 months? Percolate? Explode? How do suppose this might happen?

Culture & Collaboration:

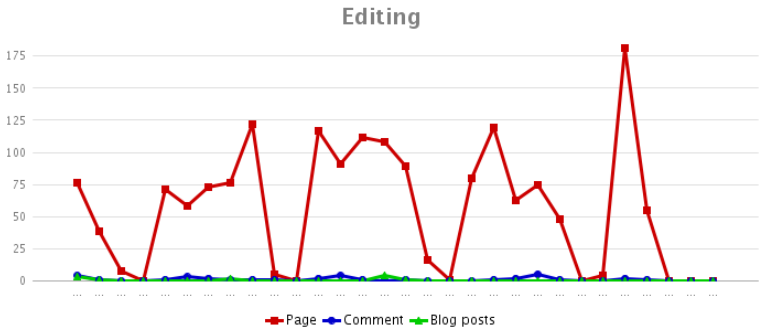
- Do you or your team have or had, before the wiki, any other ways that you shared knowledge?
- What would you guess to be the main reason(s) as to why you and your department do not work on the wiki or have not been introduced to the wiki
- Would you say your department has a culture of sharing knowledge or information?

Technology:

- How easy/difficult was it getting to grips with the technology of the wiki - like actually adding & editing pages etc.
- What kind of confusion has been brought about by Portal not being deprecated?

Appendix B: Confluence Global Usage Activity screen

This graph shows how many times pages and blog posts have been viewed over the current time period.



This graph shows how many pages, blog posts and comments have been created or updated over the current time period.

Most popular spaces (Views)

1. Contiki Holidays (2514)
2. iTropics (2093)
3. TTC Human Resources (1875)
4. Tropics (1641)
5. E-Commerce Development (983)
6. Milestones (905)
7. Commercial & Distribution - Australia (545)
8. Toronto Data Center (403)
9. Tropics Projects (369)
10. Creative Holidays (365)

Most active spaces (Edits)

1. iTropics (380)
2. Tropics (287)
3. Contiki Holidays (229)
4. Commercial & Distribution - Australia (198)
5. E-Commerce Development (169)
6. Toronto Data Center (45)
7. Creative Holidays (33)
8. Milestones (32)
9. TTC Human Resources (29)
10. Tropics Projects (21)

Most active contributors (Edits)

1. Nick Jackett (145)
2. Rachel Swailes (132)
3. Natasha Nugent (111)
4. Clinton Taylor (108)
5. Ashley Woodring (99)
6. Brett Holliday (96)
7. Gina-Lee Morris (67)
8. Astral Mansfield (64)
9. Paul Riley (62)
10. Mark Gibaud (58)

Appendix C: “ThinkBase” VisualWiki