

Barriers to Knowledge Management: A Theoretical Framework and a Review of Industrial Cases

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Abstract—Firms have invested heavily in knowledge management (KM) with the aim to build a knowledge capability and use it to achieve a competitive advantage. Research has shown, however, that not all knowledge management projects succeed. Some studies report that about 84% of knowledge management projects fail. This paper has integrated studies on the impediments to knowledge management into a theoretical framework. Based on this framework, five cases documenting failed KM initiatives were analysed. The analysis gave us a clear picture about why certain KM projects fail. The high failure rate of KM can be explained by the gaps that exist between users and management in terms of KM perceptions and objectives.

Keywords—Knowledge management, barriers to knowledge management, Knowledge-gaps, supply-driven approach to knowledge management.

I. INTRODUCTION

THE myriad range of knowledge management (KM) related books, papers, conferences, workshops; is evidence that KM is no longer a buzzword. It is a discipline that needs to be considered in any modern business strategy and planning. Large numbers of organizations are taking great interest in the idea of knowledge management. In 2007, knowledge management software was \$73 billion market, and KM spending is expected to grow nearly 16 percent to an average of \$1,224 per employee in 2008, according to [4].

But why all this interest in knowledge management?

There are wider explanations for the amount of attention being paid to knowledge management. One explanation is the attractive arguments underlying KM's value. For example, various researchers claim that KM (i) provides competitive advantage, as it allow organization to solve problems and size opportunities, (ii) increases responsiveness and innovation, (iii) save costs, (iv) supports decision making, (v) facilitates collaboration, (vi) increases employees' productivity, (vii) reduces the negative impact associated with knowledge attrition, i.e. knowledge loss when employees leave the job (see for example [13], [37]) Additionally many studies documented case studies of what they refer to as knowledge management success stories or best practices (see for example

[9], [18]). Some analysts claim that KM is a mandatory condition of success for organizations as they enter the era of the knowledge economy.

Beyond the hype, review of the literature on disappointments and failures in knowledge management impacts ([32]; [33]), states that 84 percent of KM projects will fail to have any real impact. "A disturbingly high impact proportion of programs initiated with great fanfare are cut back within two or three years" ([32], p.15). Moreover some researchers found that there is a *systematic lack of evidence for the claims put forth about the alleged knowledge management success stories* (see [16]). In his attack on the "nonsense of knowledge management", [55] reported a 2001 survey carried out by Bain & Company showing that only 35 percent of a worldwide sample of 451 companies reported satisfaction rating about 3.5 on a five-point scale, when it comes to their KM initiatives.

A number of researchers (see for example [48] thus pointed us to the need to understand the "why" and the "how" apparently many knowledge management initiatives run into difficulties and to identify the key learning points.

The purpose of this paper is to identify and explain based upon a literature review problem areas that hinder the success of KM endeavours.

In structuring the literature review, we followed the three-stage approach of conducting effective literature review, suggested by [27]. Those stages are: (i) input, (ii) processing, and (iii) output. The objective of the input phase is to identify the literature that fit the criteria of quality and relevance. To this end, we draw up an initial set of papers by searching three popular online databases (ProQuest, Elsevier, Emerald, and IEEE (Comp Soc & Xplore) using the search terms "knowledge management", "Knowledge management barriers", "knowledge management failure". We also complement our search by carrying out backward and forward search. At the processing stage, we worked on classifying and relating the material collected as to the barriers to KM. The output of our literature review was a framework depicting the barriers in KM projects. Based on such a framework, we examined five case studies documenting failed KM initiatives. The idea was to examine their differences as to factors leading to failure in KM project. The five cases were selected by searching through popular online databases (ProQuest, Ebsco

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Host, and Emerald). The cases were filtered based on two criteria, namely (i) the case was published in a peer reviewed scholarly journal, which insure a certain level of quality, and (ii) the case provides sufficient details as to the KM initiative from planning to eventual abandonment.

The remainder of this paper is organized as follows. In section II we identify and explain the barriers that exist in two KM areas: Organizational planning, enabling, motivating; and individuals' acceptance of the implemented KM systems. In section III, we introduce the case studies. In section IV, we discuss the implications of the study as to successful implantation of KM projects.

II. BARRIERS TO KNOWLEDGE MANAGEMENT

Several inter-related barriers impede KM initiatives and make it difficult to realize the full value of those efforts. The first involves the organizational areas of planning, enabling and motivating. The second type of barriers is more personal, and relate to the distinct attitudes and behaviours held by users when adopting knowledge management systems.

A. Organizational Planning, Enabling and Motivating

1. Planning

Existing KM research document a number of planning-related barriers to successful implementation of KM projects. One major barrier is linked to the lack of or poorly defined KM initiatives' goals. In planning the KM implementation, the initial step is to set the goals and understand the drivers for the knowledge management initiative. Given the costs and turbulence generated by KM projects, it was amazing that a number of firms fail to develop useful KM goals or clearly communicate what drives the implementation of knowledge management in the organisation ([32]; [39]; [40]; [45]; [33]).

Companies launching knowledge management initiatives tend towards more general aspirations such as "share best practice" [48], profit growth or improve competitive advantage [25]. According to one source, with regard to the drivers for implementing KM systems, typical firms' responses were "everyone else is doing it", "e-everything", "the need to be seen as leading edge", "sounds cool" [33]. Articulating such generalized goals makes it nearly impossible to plan and communicate the benefits of a KM effort especially to targeted users. While in order to gain the users' "buy-in", the benefits of the KM initiative must be understood by management and explained to end-users.

The planning of KM initiatives should also involve understanding what knowledge is critical to keep and what should not be kept [35], [37]. An organization cannot keep everything it has—if it does, and then it is doing pure information management. However, studies reported that a number of firms plan for knowledge management projects that involve building electronic repositories to store all the corporate knowledge. As [26] argued this is akin to the eighteenth century French encyclopedists' error in thinking that all human knowledge could be put into one book. However, when change is rapid, radical, discontinuous or

nonlinear, what is required are non-linear strategies that cannot be based on a static picture of information residing in the company's databases.

The KM literature acknowledges the central role of employees in creating knowledge, but too little planning effort has been given to other key stakeholders. [17] and [47] for instance argued that it is important to recognize the relationships with customers as sources of intellectual capital. Executives must first be able to express what value customers expect from their company and, therefore, how knowledge that resides in the company adds value for customers [19]. However, suppliers and investors are also sources of valuable knowledge, and obvious partners in intellectual capital creation that benefits all involved [51]. They directly benefit from the organization's efforts to learn, innovate, and generate financial returns. With the rapid trend toward value chain integration and strategic partnering through alliances and joint ventures, more external actors are being brought into the organizations internal planning and decision-making. Viewing these relationships as sources of systematic learning to build collective competitive advantage is a major step. Whether and how well this collective knowledge is leveraged to everyone's benefit are critical measures of strategic KM effectiveness ([35], p.51).

To the above planning-related barriers to KM, it can be added the issue of focusing on present requirements, not on what must be known to operate in the future. Indeed the ultimate goal of KM initiative should be linking and developing internal capabilities to meet both current and future needs [48].

2. Enabling

If adequate planning is an essential step for ensuring the success of KM initiatives, then information technology is a fundamental enabler for knowledge management. An information system can provide instant, integrated, or even smarter interface platform to make knowledge management much easier to employ [52]. As [35] argue, there is no question that effective KM is impossible without effective information systems and technologies (IS/IT) that enable information acquisition, retention, and sharing. However a number of studies showed that technology can, be a significant barrier in knowledge management programs. According to [35] technology produces a barrier, when information is fundamentally confused with knowledge. IS/IT captures or "codifies" information [19]. However, information is not knowledge. Information must be accessible and relevant to a moment and situation for it to support meaningful knowledge creation and application. Mountains of information captured by very expensive, often inflexible IS/IT initiatives too frequently make it difficult to identify and measure what really drives organization performance [35].

The 2001 KPMG [25] study revealed that unrealistic expectation about technology is another barrier to knowledge management. The study showed that a number of companies still regard KM as a technology issue. But as the literature

warns that “technology alone won’t make a person with expertise share it with others. Technology alone won’t get an employee who is uninterested in seeking knowledge to hop onto a keyboard and start searching or browsing”. The mere presence of technology will not create a learning organization, a meritocracy, or a knowledge-creating company” [10]. Treating knowledge as a commodity is another IT-related barrier to knowledge management. [48] Suggest that the emphasis so far has tended to be on knowledge as a commodity, i.e. making experts’ knowledge more explicit and accessible via computer applications. Herein is seen the seeds of a further problem, such knowledge tends to be “explicit knowledge” whereas the often more valuable” tacit knowledge” is neglected. Tacit knowledge is much more personal and is likely to be context-specific. This latter form of knowledge is hard to make available through computer systems. The realisation of the tacit knowledge potential requires indeed the close involvement and co-operation of the knowing subject [2]. For Peter Drucker [14], the business management sage, you can’t manage knowledge..... Knowledge is between two ears, and only between two ears. *It’s really about what individual workers do with the knowledge they have.*”

[49] went to the extreme when he claimed that attempts to codify tacit knowledge may only produce knowledge which is: useless (too difficult to explain); trivial; redundant (if subject to change); irrelevant to a wider audience; politically naive; or inaccurate ([49], 1999, p. 7). Some commentators have therefore stressed the inherent limits of intranets which merely capture the trivial and the codifiable knowledge [21].

To the above technology-related barriers to KM, it can be added the issue of technology integration. As [42] argues, although technology is rarely the ultimate solution to, or driver of, a knowledge sharing strategy, the integration of the right technology is important. Software systems should support work-related processes of individuals, who decide which information to access and store, or forward to other people. Existing and new technologies are often quite capable of supporting effective knowledge sharing processes, however, unless there is a close fit between employees’ need requirements, technology in itself can become a barrier. Not because of technical problems but because actual problem solutions do not match people’s need requirements. Knowledge management systems therefore cannot be seen as stand-alone applications but should be integrated with all aspects of business. However as observed by [26], knowledge management effort in firms tends to be fragmented. It is still rare for a large company to have a common enterprise-wide knowledge base because daily business pressures act against initiatives for enterprise collaboration. As a result, most large organizations are still only doing departmental, functional activities, e.g. intranets. These initiatives were built in silos without enterprise collaboration in mind because no one thought strategically how these individuals should be sharing knowledge. These firms must tie together these disparate collaborative efforts [26].

A recent Delphi study of knowledge management systems carried out by [38] revealed that organizations need more integration between technologies intended to support knowledge and those supporting business operations. This gap between implemented KM technologies and organizational needs is illustrated in the following quote from one senior manager who participated in their study: “*I am not quite sure...where knowledge management systems ends and business systems starts...* ([38] p.592). As a result the authors suggest a revised approach to developing knowledge management systems where technology should not be created as stand-alone applications but strongly integrated with the overall technology’s needs of the firm.

Other technology-related barriers discussed in the literature include a wide range of general IS issues, such as adoption (usefulness, ease of use, task-technology fit), support (training and technical support), IT project management (user involvement, management), and software upgrades and costs.

3. Motivating

While there is consensus in the literature about the essential role of technology in KM, many studies suggest that the biggest hurdle to knowledge management is not implementing cutting-edge IS solutions, but motivating people to contribute to the KM effort and share their know-how. For [12] knowledge originates in the minds of individuals, so we must realize that unless organization members are motivated to share, no IT solution can deliver the desired goal.

A major fundamental barrier to motivating people to participate in KM effort is corporate culture. For example, an Ernst & Young survey of 431 US and European organizations conducted found that the biggest reported difficulties were “changing people’s behaviour”, and the existence of an inappropriate “organizational culture” [33]. Likewise, it has been noted that getting employees to share what they know is no longer a technology challenge, it’s a corporate culture challenge” (Hibbard and Carillo, cited in [44]. “Knowledge management is a business practice more than a technology” reports the research director of Delphi Consulting Group in Boston “In our research, users clearly identify cultural issues as the largest obstacles to implementing knowledge management” [48].

[1], in their survey of the application of knowledge management, show that the majority of the success of knowledge management in their experiences of knowledge sharing is closely related to culture. [10] also point out the eight factors that contribute to the success of knowledge management projects with many that are related to corporate culture. In addition, they state that in order to successfully obtain and transfer knowledge, constituents of corporate culture also determine the extent of its success. Their research claims that when an enterprise simply has a complete system of knowledge management, but lacks a corporate culture that supports it, and then the efficiency of knowledge management is limited. It is only when both are present that its effect will be maximized [52].

[26] sum up the problem best “knowledge is not information and knowledge sharing is not information sharing. Therefore, knowledge management cannot be reduced to information management. Because knowledge, at rock bottom, resides with the knower and not some hardware or software, knowledge must flow among knowers. This means that human relationships within an organization are crucial considerations with regard to knowledge creation and utilization within that organization. To succeed, knowledge management must emphasize the management of these human relationships. Such relationships are themselves a function of the organizational culture.

Another motivation-related barrier is the lack of managerial leadership; which can limit knowledge sharing practices. The challenge to managers is to create an environment in which people both want to share what they know and make use of what others know [15]. People cannot always be expected to share their knowledge and insights simply because it is the right thing to do. Managers need to reassure employees that they should not sit on ideas or concepts for fear of their intellectual property being stolen. The solution is to develop that idea or concept in collaboration with other people [42]. Managers should also lead by example when it comes to knowledge management activities. However as shown in [12]’s study managers are the first to send out e-mails praising the newly-purchased system and glorifying its benefits. However they are the last ones to begin using them. [12] found in his study managers who admitted that they themselves seldom used the tool but expected employees to use it.

Lack of communication is another barrier to KM. In order to gain the users “buy-in”, the benefits of the KM system must be understood by management and explained to the end-users. When users do not understand the benefits offered by the newly implemented systems, they only see an added responsibility or burden. Additionally [12]’s study showed that in the absence of clear communication and guidance as to the objectives of the KM systems, the negative perception of the systems overwhelmed the positive. As a result common perceptions of users participating in his study were “Only people with no work will use it”, “Do managers keep tabs on who uses it?” and so on.

B. Personal Barriers

Personal barriers involve the attitudes and behaviours of users that impede the success of knowledge management initiatives. Users concerns include perceived lack of usefulness, the time and effort required to invest in the KM systems versus the benefits derived from their usage, incentives for sharing knowledge.

1. Perceived lack of usefulness

One major personal barrier to knowledge management is user acceptance [34]. If users are not accepting towards the knowledge management system, or towards the knowledge management program, it can be a significant barrier. For user

acceptance to happen, management acceptance is also very important. For [15] knowledge management should not be a forced activity, but something that users want to do, i.e. the value proposition should be sold to them so that they can see the benefit of implemented knowledge management systems.

When users do not understand the benefits offered by the newly implemented systems, they only see an added responsibility or burden. An example is the case of one financial firm reported by [12]. The firm developed a Lotus Note database for recording insights from researchers to be shared by their peers. For the first month it was in operation, the company saw only two postings. Disturbed by this, the CKO, called the researchers into a meeting and pushed the use of the system further. The action backfired by infuriating the researchers, one of whom commented, “*I am paid...to make the company money; I do not see the point of this new knowledge system, and hence I don’t use it...When I see the benefits I might consider.*” The CKO of the company was later terminated. After eight months the author went back to speak to the researchers. To his surprise, everyone in the R&D group was using the system. The researchers have taken it upon themselves to customize the tool and use it to store working papers, collaborate on running simulations, and review each others’ work and so on.

2. Time and effort

One of the biggest barriers to success is staff members’ complaints that they do not have enough time to do knowledge management [26]. This is mostly based on the perception that knowledge management is something “extra” that they believe they need to do and not something that is integrated into their daily work environment. People’s perceptions need to change for them to see that knowledge management is part of their daily work routine and not something extra that they do. They should be able to see the value added from the activities that they participate in [15].

Time is a problematic area or barrier, where staff members are measured on the number of hours they deliver in respect of outputs, such as in the world of accountants, lawyers, solicitors and engineers. For them, time is money and it is difficult to change the perception that knowledge management can make them work smarter and faster, even if they do spend some time on it upfront [15].

3. Users perceived lack of incentives to share knowledge

This barrier arises out of the structural imbalance between knowledge seekers and knowledge providers. The knowledge provider, while able to provide knowledge, typically has little or no incentives to do so, i.e. *why would anyone in the organization benefit from my experiences and knowledge? Why should I give away the fruits of my labour for free to others here? As much as I would like to pass on my knowledge, how could I possibly find the time to do it?* The knowledge seeker is highly incentivized to receive knowledge, but unable to do so without the cooperation of knowledge provider [17].

The [12] study revealed that one factor that disincentives individuals to share knowledge is their fear to be known as an expert. Once so titled they find themselves being allocated to projects based on their past experiences rather than those that may be more challenging and have room for learning. One engineer participating in his study said “*If I contribute nuggets of know-how on how to run applications on the Unix box, soon I’ll be dubbed in the “Unix Guru” and that’s all I’ll end up being in charge of*”.

III. BARRIERS TO KNOWLEDGE MANAGEMENT FRAMEWORK

In this review of the literature we have identified a host of barriers to knowledge management. As seen in Fig. 1 both organizational and personal barrier are inter-related. Additionally it can also be observed from the above discussion that organizational barriers in terms of planning, enabling and motivating are drivers for the personal barriers.

practical experience demonstrate that knowledge management cannot be considered as an ‘add-on’ to prevailing organizational processes. After all, knowledge management is not an end in itself; it is a means to an end. Knowledge management initiatives must be considered as integrally linked to corporate and organizational strategies.

This insufficient planning of KM initiatives may not be accidental. It seems to be linked to the core driver of KM, which is making existing knowledge more widely available; with the intent to ensure that the intellectual property becomes owned by organizations [48]. Knowledge management’s missions tend to focus more on how we can collect knowledge and make it available within the organization.

Let’s consider the following typical definition of knowledge management:

- “Knowledge management focuses on organizing and making available important knowledge, wherever and whenever it is needed [44].
- “Knowledge management is the coordinated effort that promotes and leverages an organization’s known how” [5].
- “Knowledge management is defined as the organized and systematic process of generating and disseminating information, and selecting, distilling, and deploying explicit and tacit knowledge to create unique value that can be used to achieve a competitive advantage in the marketplace by an organization.” (Hult, cited in [22])
- “An organization’s knowledge can be managed like any other asset” (Guthrie, 1992, cited in [55])
- “We define knowledge management as the collective phrase for the group of processes used by organizations to increase their value by improving the effectiveness of the generation and application of their intellectual capital” (Gartner 2000 cited in [22]).

Here knowledge is seen as an organizational asset which is independent of the individual; and the mission of knowledge management is to make such an asset more widely available to organizations’ members. This supply-driven approach assumes that it suffices to make knowledge available using cutting-edge information technology and people will come to use and share available knowledge [22]. Two KPMG studies revealed that KM is still regarded as a technology issue by a large proportion of companies participating in the study. However as discussed in section II, the problem associated with such an IT driven approaches is that it led firms to overemphasis technological issues at the expense of *such major issues as culture and users behaviour*. As shown in [39]’s study which involved 431 firms, it is *only after the technological capability exists that firms realize how vital the people factors are*. This is because it is now established that getting employees to share what they know is no longer a technology challenge; it is a cultural issue [44]. No IT solution can deliver the desired goal if the ingredients of KM, i.e.

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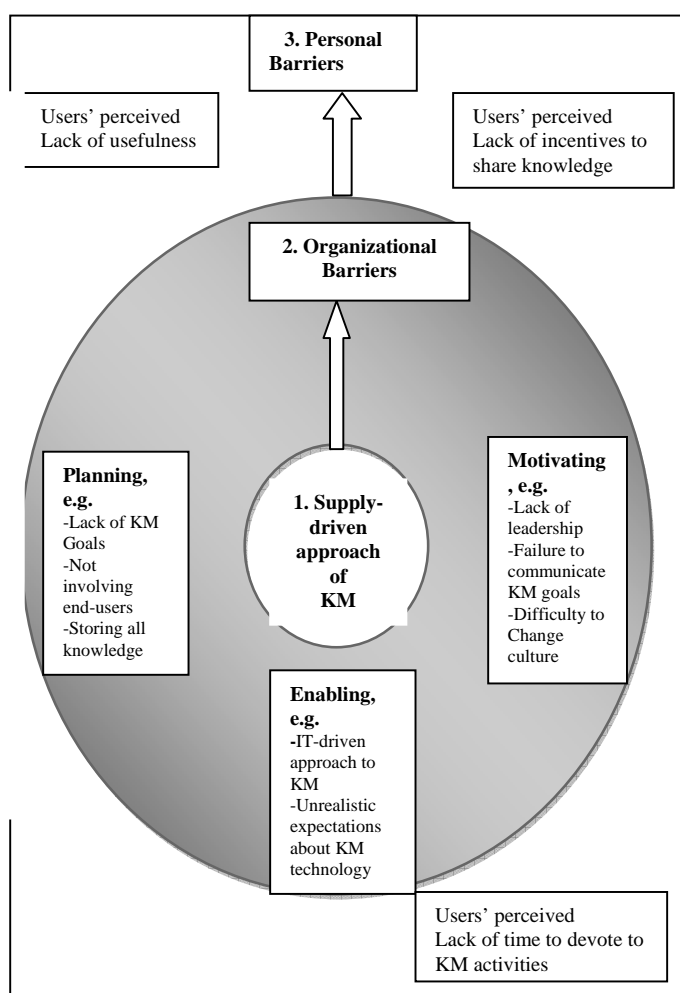


Fig. 1 Barrier to knowledge management framework

The lack of good planning; especially in terms of setting clear business rational for pursuing the KM initiative clearly looms large in the previous analysis. Existing research and

people are not willing to participate. However most KM studies agree that changing both culture and people's behaviour constitute a major obstacle. It is something messy and hard to manage revealed one senior manager [48]. All in all these characteristics may make knowledge management not only difficult but impossible to succeed because people which are the ingredients of KM do not see good reasons to cooperate with the KM mission of routinely capturing their knowledge to build organizational asset. We refer to this situation as the "culture trap" of current KM approach. The general situation is summarized in the following case study reported in [22], "The organization does not understand how knowledge is shared here and I tend to ignore the knowledge management initiatives, wherever I can" [22]. These cultural/behavioural impediments associated with the supply-driven IT approach of KM, have the potential to lead to the personal barriers discussed in Section II; where employees question the benefits of the new KM systems and therefore feel not motivated to share their knowledge and devote time and efforts to contribute to KM activities.

So how could companies escape the above "culture trap"?

Based on the previous analysis, we believe that knowledge management practices often seem to fail because companies attempt to adapt organizational culture and users' behaviours to fit their supply-driven mission to knowledge management, instead of implementing them so that they fit end-users needs and requirements, e.g. situational need of knowledge. Escaping such a "culture trap" would necessitate adjusting the current IT-supply driven approach of KM in such way that both the supply side and demand side of knowledge, i.e. individuals' needs will work in an integrated way. In other words moving from "Possessing knowledge is power" to "Possessing and using knowledge is power"!

IV. CASE STUDIES

Five case studies have been analyzed in this section. The five cases were selected by searching through popular online databases (ProQuest, Ebsco Host, and Emerald). The cases were filtered based on two criteria, namely (i) the case was published in a peer reviewed scholarly journal, which insure a certain level of quality, and (ii) the case provides sufficient details as to the KM initiative from planning to eventual abandonment. In this section, first we will present a brief description of the cases. Next, we analyze the cases based on the analytical framework presented in the previous section.

A. Brief Description of the Cases

The cases collected include two pharmaceutical companies (Braganza and Möllenkramer, 2002), (McKlinay, 2002); a global bank (Newell et al. 2001), a manufacturing company (Kalling, 2003), and a European headquartered company (Storey and Barnett, 2000). Table I provides a brief description of each case, in terms of its business, knowledge management initiative and drivers for the knowledge management programmes.

Most of the companies were stimulated by the objective of storing knowledge and making it available within the organization. For example PharmaCorp launched its KM initiative with the objective of storing relevant information and allow users to share feedbacks, comments and informal insights. Similarly Eurobank's three KM initiatives focused on collecting knowledge and making it more widely available to organizations'. Such a supply-driven approach was also dominant in WorldDrug; MNC and International Resource cases (cf. Table I).

TABLE I
 DRIVERS OF KM INITIATIVES IN THE FIVE CASES STUDIED

Company	KM initiative	Driver of KM initiative
PharmaCorp	Knowledge Enabled Worktable	storing relevant information and allow users to share feedbacks, comments and informal insights
Eurobank	OfficeWeb	Capturing and storing knowledge in an intranet for use by domestic branches
	GTSnet	Capturing and storing knowledge in an intranet for use by overseas branches
	Iweb	Storing information that was previously available in other forms, e.g. written documents
WorldDrug	Lessons	Capturing and storing insights about factors causing project delays
	Warehouse	Compiling and storing archive of best practices and discussion forums
	Electronic café	Capturing and storing tacit knowledge
MNC	Production project	Capturing and sharing knowledge about production methods
	Supply chain project	Codifying and storing customer knowledge
	Design project	Storing state-of-the art design methods so that designers could use such methods to improve their design practices
International Resource	Intranet, websites	Storing internal knowledge

B. Analysis of the Cases

In this section we analyse the five case studies based on the theoretical framework presented in the previous section. Hopefully the analysis would help us develop a picture of the barriers to knowledge management in practice and to identify related lessons.

1. Organizational Barriers

Planning

Planning-related barriers were diverse and present in all the companies studied.

Failure to articulate useful KM goals was a major planning-related barrier observed in all the companies' studied. Given the cost and turbulence associated with KM implementation, it was amazing that all the companies set generalized goal of KM, mainly for the purpose of justifying the KM initiative to management. For instance Pharma Corp set as goal for its KM initiative (i) having better and consistent access to and use PharmaCorp knowledge across the globe, (ii) creating support tools to ensure tasks are performed consistently. Similarly Eurobank set as a goal for its KM initiative developing a global knowledge network so that the services in the bank could be integrated. Likewise International Resource's driver for KM was the establishment of a "learning organization; while the main goal of WorldDrug's KM initiatives was to achieve what they call "organizational innovation".

Additionally end-users were excluded from the planning of KM initiatives in all the companies. These can be observed from the composition of the teams appointed to undertake KM development tasks. For instance in the PharmaCorp's case no representative of end-users was included in the team charged of developing the KM initiative. Similarly in the Eurobank and WorldDrug cases external consultants took the major role in developing the KM initiatives without any involvement of end-users. Likewise International Resource set up a high profile team comprised of nine management staff, to implement the KM initiative. However absent were representatives of non-management employees; it was felt that others could be brought into the process "as appropriate".

Articulating too generalized goals together with excluding end-users from the planning process, made it nearly impossible for the companies studied to plan what type of content is needed. Consequently the companies tended to store all possible knowledge; which gave rise to other problems. For instance, in the PharmaCorp's case there were serious defects in the quality of the information being stored in the system. One person in the Knowledge Management function estimated that only 10-15% of the Content was being maintained systematically (Braganza and Möllenkrämer, 2002). Similarly in the Eurobank case, there had been complaints that the content was not always up-to-date. As a result individuals continued to use alternative sources when they wanted particular information. In the MNC case, when "supply" was launched, it was not fully utilized as end-users noticed that the system merely provided them with information that they already possessed.

Not diversifying source of knowledge was another impediment observed in the majority of the cases. One exception is Eurobank that planned its intranet in such a way that it contains both internal knowledge and information collected externally. Additionally, not addressing the need to support future action was observed in the majority of the cases studied. For instance in the WorldDrug' lessons learned initiative; one would expect that users would use the KM system to provide insights that would both challenge and suggest improvement of the current processes. However, it was surprising that the KM initiative was used to buttress existing processes rather than seriously considering radical

alternatives as portrayed by the following quote from one user:

"We're a wired company, but not a wired organization. You can have any piece of kit you like. We've connected desks and tasks, but not people and imaginations. Knowledge management— so far—has hard wired what we do already. We've wired our existing processes." (McKlinay, 2002).

One planning-related impediment that emerged from the case studies is the failure to account for the hindering effect of *organizational politics* on KM initiatives. In the majority of the cases studies, conflicts among the KM development teams' members hindered the successful implementation of the initiatives. For instance in the PharmaCorp a conflict emerge among the development team, namely between IT people and "knowledge content and design team". The content and design sub-stream initiated the creation of an Intranet site, PharmaWeb. However, during PharmaWeb's development, internal resistance began to surface. Managers in the IT function considered the PharmaWeb development as simply 'going for the quick win', while they (in the IT function) were working on the actual Worktable solution. The sentiment in the IT function was that the knowledge content and design sub-stream was stepping onto their "turf", and, they should focus their energies on the Worktable content development. IT saw the PharmaWeb launch as a counter move to the Sales and Service Worktables and saw content and design as attempting to position themselves as coming up with a product. Rather than be enthusiastic about it, they (IT and other functions) were not and the PharmaWeb was not embraced by the organization (Braganza and Möllenkrämer, 2002).

Similarly in the WorldDrug case organizational politics were important factors causing the abandon of the "Café" initiative. The objective of the Café initiative was to capture tacit knowledge by offering a private space for open and informal interaction among project members. However some functions, e.g. regulatory affairs felt that the "Café" initiative has the potential to introduce novelty and uncertainty in a process they relentlessly surveyed to render homogeneous and predictable (McKlinay, 2002). Likewise in the International Resource, the political agenda between two "camps", e.g. IT and media affairs department, was a major failure factor of the KM initiative. The two departments had very different agendas, priorities and views on how to best build and manage these processes. The team suspected that the KM project had been viewed by the IT function as a means to achieve a dominant position in strategy, methodology and budget. The tensions were exacerbated by the broadcast (via an imprudent error in the instantaneous and irrevocable act of e-mail addressee selection) to a wider audience than intended of a note expressing the exasperation of one member of the team and the suspicion that the commitment of the IT manager to the principles of the KM initiative was very much open to question (Storey and Barnett, 2000).

Enabling

In KM initiatives, one major step is to invest in the enablers, e.g. technology, human resource that would ensure a successful implementation of the KM projects. In the cases studied the majority of the enabling-related impediments stemmed from the IT-driven approach that characterized the way the companies approached Knowledge management.

The IT-driven approach, i.e. technology constitutes a KM programme together with unrealistic expectations from technology, were dominant enabling-related impediments in all the cases studied. In the majority of the cases, the IT department assumed the leading role in KM initiatives. The IT-driven approach was observed in how the companies perceive KM endeavours. In the majority of the cases, KM was synonymous to implementing the KM technology; rather than supporting business processes. For instance, in the PharmaCorp case, KM very quickly became associated with IT developments, exemplified by Worktable. Similarly in the Eurobank case, KM meant building intranets. Likewise in the WorldDrug case, KM was reduced to designing a warehouse and investing in groupware technologies. Such an IT-driven approach made a number of the case companies over-estimate the ability of KM technologies; and thus rush to implement the technology without a realistic planning. For instance, in the PharmaCorp, due to some organizational politics, the content and design sub-stream rushed to design an Intranet-based tool, Knowledge Across the Net (KAN), to publish the content they were developing. However, while piloting KAN, it turned out that many of PharmaCorp's country locations did not have Internet access and/or the minimum required hardware to do so. This helped to explain why KAN was not as widely accepted as initially hoped (Braganza and Möllenkramer, 2002). The same applied to the Library application; which was a large data repository of documents, information, and other knowledge from internal and external sources, exemplified by competitor intelligence reports. After an extensive study; PharmaCorp's KM team with the help of consultant, concluded that *'the Library content was growing, but the functionality of the application did not meet the necessary requirements.* This resulted in considerable internal debate. The executive decided that the Library application itself would be temporarily shelved. In the Eurobank case, Officeweb was developed into what was considered to be a useful intranet package, with content that was needed at the branch level. However, the project turned out to be a disaster because the bandwidth of the infrastructure was too narrow for the traffic they were attempting to send via Officeweb – it took 20 seconds to change pages. As a result the project had actually been abandoned (Braganza and Möllenkramer, 2002). Similarly in the WorldDrug Case, the data warehouse did not enable individuals to search for specific themes or milestone events across drug development programmes, or by functional groups. This was due to the fact that the Warehouse' was not a tool that could be adapted by workgroups to specific contexts. The Warehouse' was understood as irrelevant to the low level coordination that is an inherent part of administrative work.

As a result individuals decided to minimise their contribution to or use of the 'Warehouse' database (McKlinay, 2002).

Treating knowledge as a commodity, e.g. focusing on explicit knowledge rather than the more valuable implicit knowledge, was an enabling-related barrier observed in the majority of the cases studies. For instance in the PharmaCorp case, the types of knowledge content being retained was mainly reduced to customer name and address; and personnel details, e.g. names and contact phone numbers. Similarly in the Eurobank case, the focus was on capturing information on countries, trade and cash management, people in the network, and information that was previously available as written document, e.g. corporate bus timetable. In the International Resource emphasis was placed on building informative websites. One exception was the WorldDrug's café initiative which focused on capturing tacit knowledge through open dialogue, and MNC's KM initiatives, which attempted to capture experts' knowledge about production methods, customer behaviour and design techniques (McKlinay, 2002).

In the absence of grounding KM to useful goals, e.g. supporting strategy, it was no surprise that many of the KM initiatives in the cases studied were silos-based and lacking integration. For instance in the Eurobank case the researcher found that there were more than 150 intranets operating independently of each others. Similarly, WorldDrug's KM programme involved there different initiatives, e.g. lessons learned, Warehouse and Café, without any integration among each others and within the corporate information system. Likewise MNC implemented within its KM programme three different KM projects namely production, supply and design projects. Additionally within the PharmaCorp case, KM was operationalized through the functions, exemplified by sales, products implementation, and customer server; with each function having its own Knowledge-enabled Worktable, i.e. its own IT interface and knowledge repository.

One enabling-related impediment that emerged from the case studies is the role of consultants. In the five cases there was a lack of a balanced approach when it comes to using the external consulting resource. In three of the cases namely PharmaCorp, Eurobank, and WorldDrug, external consultants assumed a leading role in terms of implementing KM programmes. For instance in the PharmaCorp case, three different consulting firms were involved at different times. Each firm supplied its own people, who brought with them different (and often conflicting) methods, techniques, and language. Similarly in the Eurobank case the financial resources were used mainly for recruiting external consultant. There were 140 consultants from the selected external company working on the GTSnet project together with only a handful of Eurobank employees. Likewise in the WorldDrug case all the KM programme was developed by a major consultancy firm. Such an over-reliance on external consultants to carry out KM projects gave rise to a number of problems. For instance in PharmaCorp, consultants positioned themselves between senior managers and project team members. This placed team members at a disadvantage when

the consultants left (Braganza and Möllenkramer, 2002). In the Europbank case the external consultants had the technical expertise to develop the IT needed for the GTSnet intranet, but they lacked relevant business knowledge (Newell et al. 2001). As a result GTSnet had failed to attract users as it contained outdated content soon after it was implemented. On the other hand in International Resource and MNC cases, no external advice was sought. This have had deprived such companies from benefiting from experience of other companies who had pursued similar initiatives. Additionally IS issues such as adoption (usefulness, ease of use, task-technology fit), support (training and technical support), IT project management (user involvement, management), and software upgrades and costs was observed in the majority of cases.

Motivating

Motivating end-users to actively engage in KM activities is paramount. This would ensure that the organization's investment and effort does not end with the purchase of KM equipment and software. However in all the five cases, motivation-related initiatives were lacking.

In the majority of the cases studied, senior management was committed only to a point. As long as KM appeared simply to be an add-on to existing organization processes and seemed to promise at least "theoretically" greater efficiency, the support was abundant. However the support did not expand to a willingness to address impediments that hinder the success of the KM initiatives. For instance, in the International Resource case, when the business conditions begun to deteriorate, the response of senior management was to curtail the KM project. Similarly in the PharmaCorp case, when IT costs start escalating the Knowledge-enabled Worktable project was dumped. The same observation applied to the other cases where KM initiatives were abandoned as soon as problems emerge. Additionally in all the five cases, there were no formal motivational programmes aimed at communicating the KM benefits to end-user or to address cultural barriers. These in turn contributed to the failure of KM initiatives. For instance in the WorldDrug case, end-users were reluctant to use the implemented Data Warehouse because they feel that using such a system is a sign that the individual's experience was inadequate. 'I'm a problem-solver. I don't actually have much of a job left outside of fire-fighting', remarked a sceptical project manager" (McKlinay, 2002).

One motivation-related impediment that emerges from the case studied was the lack of organizational stimulus that would motivate individuals to participate in the KM activities. In all the cases, there were neither incentives nor sanctions to encourage participation. KM remained dependent upon the willing participation of the knowledgeable (McKlinay, 2002).

2. Personal barriers

A major personal-related impediment identified in the majority of the cases studied was end-users' perceive lack of usefulness as to the implemented KM systems. For instance,

in the PhamaCorp case, the Knowledge-enabled Worktable (KeW) was not widely used by end-users. Prospective users had the sentiments that the implemented KM systems were not linked to their jobs. This was one major reason for the management decision to abandon the KeW project.

In the Eurobank case, end-users complain that the information on the intranet was not up-to-date and this was because there had been no control over what was put on the system. As a result end-users continued to use alternative sources when they wanted particular information. When asked to give an example of the kind of knowledge which users were finding useful on Iweb, the best example that could be found was of the corporate bus timetable (Newell et al. 2001).

In the WorldDrug case, end-users perceived the implemented "Warehouse" 'as a tool that could not be adapted to specific contexts of their jobs. Similarly in the MNC case, the "Supply project"; which was designed to support salespeople during their sales visits was not widely used. Sales people claim the system cannot give them any new information that they do not already have about their particular customer. As to the "Design project", which was aimed to support designers in generating prototypes, it was not regularly used. Designers at the different plants claim they understand the system, but that they never use it, simply because it is cumbersome and it does not give them anything they could not resolve by other knowledge. They still produce the same amounts of prototypes as they did before. Raw material cost has not been reduced (Kalling, 2003).

To the perceived lack of usefulness, it should be added the perceive lack of incentives to share knowledge which was observed for instance in the WorldDrug case. Individuals were not widely contributing to the "Warehouse" system because they felt that such a KM initiative made them surrender willingly the very expertise and experience that defined them as experts. 'I'm being asked to give myself away', commented one statistician team leader. Additionally individuals in the cases studied lacked incentives to devote time to contribute to the KM activities (McKlinay, 2002).

V. MANAGERIAL IMPLICATIONS

The paper ends with discussing common factors to the failed KM projects based on the literature and the cases studied. In the following we will describe each of the four factors below. They are:

1. Focusing on the supply side of knowledge at the expense of the demand side,
2. Not letting KM recipients determine knowledge to be capture
3. Not putting in place a formal process for knowledge transfer and control
4. Not designing motivational practices to entice end-users to KM

1. *Focusing on the supply side of knowledge at the expense of the demand side*

A pivotal barrier to KM observed in all the cases we studied, was reducing KM's mission to the supply side of knowledge; with knowledge being independent of the individual. We consider this impediment as pivotal because it has implications on most of the impediments to KM we discussed in sections II and IV. First, focusing on the supply side of knowledge, i.e. storing and making knowledge widely available; makes companies pay less attention to the planning process including *articulating useful KM goals*, e.g. supporting strategy, achieving economic or industry value; and accounting for such destructive factors as conflicts among KM development teams and organizational politics. These in turn has the potential to affect senior management commitment. As we have seen in the case studied, in the absence of grounding the KM initiative into useful goals, such as the firm's strategy, senior management commitment was up to a point. The commitment did not extend to a concrete willingness to address complex problems such as micro-political processes or end-users lack of acceptance of the implemented system. Rather senior management elect to abandon the whole KM project as soon as the business situation deteriorates or the problems related to the KM project look insurmountable. Second focusing on the supply side of knowledge lead companies to assume that it suffices to make knowledge available using cutting-edge information technology and people will come to use and share available knowledge. As a result they tend to marginalize the role of KM's customers, i.e. individuals in the KM endeavour. In almost all the cases studied, the KM development team did not include any representative of KM recipients. While as Braganza and Möllenkramer (2002) observed, making individual share their knowledge require more than he rhetoric of involving people. Knowledge is highly personal, gained over a long period of time through the individual's experience, background, experience, and cultural heritage. Third, as a the main focus was on capturing and storing knowledge, it is no surprise that none of the companies we studied paid attention to designing motivational practices that would stimulate individuals to contribute to KM initiatives. Consequently, prospective users reject or under-utilise the implemented KM systems as they found them lacking usefulness.

2. Not letting KM recipients determine knowledge to be captured and shared

The lesson to be drawn from the cases studied is that excluding KM recipients from the KM development process is a key failure factor. In all the cases, individuals other than the end-users of the KM systems were deciding about the type of content, medium, technology and knowledge management applications that would improve end-users activities. For instance in the PharmaCorp case, the KM initiative was operationalized through a development team. However, People in the development team lacked a clear context for specifying which specific knowledge-elements, e.g. data, competitor intelligence, personal informal insights, or data about sales

personnel in the Person Locator, were business-critical. Hence, each knowledge-element was assigned implicitly equal weighting. The pitfall is that without a clear context, knowledge is defined in general terms, and specific elements that are business critical get insufficient attention (Braganza and Möllenkramer, 2002). Similarly in the Eurobank case, the business case for setting up GTS intranet was done by external consultants. However, while the external consultants had the technical expertise to develop the IT needed for the GTSnet intranet, they did not have the relevant business knowledge. As a result, GTSnet had failed to attract users as it contained outdated content soon after it was implemented. The key implication for KM is that individuals, for whom KM applications have been implemented, should be at the heart of the KM initiatives. After all it is this people who have the expertise to both identify the type of knowledge they need to support their activities and how it should be delivered to them. Similarly it is the KM recipients who are well positioned to know the type of knowledge that could be useful to other activities within the business process. Consequently, as Braganza and Möllenkramer (2002) suggested senior managers should create a space within which people from different functions can come together to forge knowledge across each business process.

3. Not putting in place a formal process for knowledge transfer and control

A critical failure factor in the cases studies was the lack of any process that would enable individuals to transfer and report their knowledge. In the absence of a reporting mechanism individuals tend to (i) report all the possible knowledge they have using all the mediums they could have access to; which gave rise to information overload, or (ii) not reporting their knowledge which resulted in considerable loss of operational knowledge.

4. Not designing motivational practices to entice end-users to KM

Because knowledge is bound up with people's ego and occupational meanings, it does not emerge or flow easily across role or functional boundaries (Davenport, 1998). After all as the management sage Peter Druckard argued "...you can't manage knowledge. Knowledge is between two ears, and only between two ears. It's really about what individual workers do with the knowledge they have." (Drucker, 2003). Therefore the presence of motivation to create, share, and use knowledge is paramount to KM success. However it was amusing that all the case studied shared the common feature of not implementing any incentives that would stimulate KM recipients to participate in the KM activities. This reinforces the belief that those companies, with their supply-driven approach to KM, were assuming that their KM initiatives are self-implementing. That is it suffices to make knowledge available using cutting-edge information technology and people will come to use and share available knowledge.

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