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THE BALACING ACT OF MANAGING VIRTUAL WORKING IN KNOWLEDGE-INTENSIVE ORGANISATIONS

ABSTRACT
In knowledge-Intensive Organisations (KIOs) the creation of knowledge is central to achieving the innovation and flexibility needed for survival and sustainable success in the new, knowledge based economy. Key factors in KIOs are virtual teamwork, knowledge sharing, and managing the brainpower. In a virtual situation, the development of trust is crucial to achieve knowledge sharing, but the realisation of trust by e-communication is complicated. Managers play an important role in creating the communication and social interaction needed to build and maintain trust. They also need to apply appropriate control systems, to align individual and group actions with the interests of the organisation. 'Just' working along the line of a very long list of tasks needed to be carried out in a complex, continuously evolving environment, trust building processing and social interactions, could – at best – end up to be a daunting task for most managers. Therefore we argue that a change in the organisation's culture and managers' underlying mental models is needed. Nonaka and Teece's [29] concept of *ba* supports this view, and is used to argue that managers should provide the physical (meeting rooms), virtual (ICT), and mental (common goals) space for creating knowledge. To illustrate and enhance the analysis, two case studies are introduced, one an established, very large ICT solutions provider, the other a young, dynamic multimedia designer. The cases show the difficult balancing act managers in KIOs have to perform in order to fulfil their essential role in realising the optimal alignment of individual talents and characters with organisational goals towards profitable knowledge creation and sustainability.

Keywords: *virtual working, knowledge-intensive organisation, control, communication, trust*

1 INTRODUCTION
Today's organisations are constantly seeking new configurations of existing organisational structures to adapt to changing environments towards survival and sustainable success. Therein, using ICTs to enable and support several types of remote collaboration, plays a crucial role [8, 6]. Remote collaboration has various forms, from individual employees – possibly self-employed – working at home regularly, to dispersed teams and even virtual organisations, where the individuals and/or groups – who are part of the same or different organisations – are involved in project-based work where relevant responsibilities are allocated according to the immediate demand for particular expertise [14]. The application of communication practices in the virtual space is interwoven with the cultural and structural change initiatives within the business, making it more likely that the proper environment for knowledge sharing will be created [8, 2].

Although *"… knowledge is the engine of change"* [2:50], many organisations fail to acquire and maintain the right knowledge and expertise they need as a key driver for the effective implementation of change and sustainable success [31]. Taking this one step further, we argue that organisations need to transform themselves into knowledge-intensive organisations (KIOs) where a culture for knowledge sharing will be developed as a dynamic process embedded in, and reinforced by, the organisation's corporate culture [33, 2]. This new strategic approach relies on the effectiveness of explicit and implicit information sharing and the development of new linkages between value-creating activities that will transform decision-making processes and thus create new ways of competing for the organisation [7]. Virtual work, in this context, can be considered from different perspectives. For the organisation, virtual collaboration practices can underpin the effective exploitation of technical expertise in the business and they

can also contribute to employee commitment, retention, flexibility and productivity [35]. While this clearly benefits individuals as well, there is often a prevailing feeling that geographical co-location makes the communication needed for knowledge diffusion and knowledge sharing easier [3], and that, therefore, there is an inherent friction between remote collaboration and the creation and sharing of knowledge in organisations.

In our paper, we will discuss the role virtual working can play in knowledge sharing practices deployed in the context of knowledge-intensive organisations. Next, we will draw lessons for the management of dispersed teams in knowledge-intensive organisations, illustrated with short case descriptions. The conclusions will address the influence of managerial behaviour in changing an organisation's culture to realise the knowledge creation and sharing in KIOs.

2 KNOWLEDGE-INTENSIVE ORGANISATIONS IN CONTEXT

2.1. Setting the stage: The era of innovation

There is a long way to take through revolutionary changes in organisational structures starting from the era of the industrial revolution in the 19th century and moving onwards to the information age some decades later to reach the threshold of knowledge age in the 21st century. Gone are the days when the idea of a functional department handing over to another functional department was the way to organise for work [2]. As DeFillipi [14] claims:

> The new economy is a knowledge-based economy without borders, where the race is between companies and locales over how to learn faster and organise more flexibly to take advantage of technology-enabled market opportunities". [14: 8]

With technology drivers underpinning communication processes and thus exercising a tremendous impact on customer's expectations and other performance requirements, linkages among people within the same or between different firms are enhanced and knowledge is created, shared and exchanged giving great opportunities to organizations to view innovation as part and parcel of their daily routine processes [42].

2.2. Getting on the stage: Knowledge-intensive organisations

A shift towards innovative organisations that employ technology to facilitate project-based independent, 'any-time, any-place' collaborations is the hallmark of the new economy. Thus old-economy business models characterised by rigidity and inflexibility are gradually replaced by new-economy business models, which value highly interdependent joint collaborations and intensification of knowledge sharing practices [14].

In the mainstream thinking of the existing literature knowledge-intensive organisations (KIOs) are differentiated from 'industrial companies' as the ones with high-knowledge intensity [37, 14]. KIOs embrace issues related to interpersonal networks, expert individuality, self-interest, and social eminence [16, 37]. Starbuck [37] points out that in KIOs professional knowledge may not be in individual people; instead it could be the outcome of shared knowledge among experts who build their own roles or compete for resources in an environment of autonomous collegiality and structural flexibility. As a result, the development of networks in the KIOs environment enhances the durability and flexibility in social relationships and the new social structures that accrue facilitate the attainment of organisational goals [30].

In this context it becomes an unavoidable prerequisite that KIOs downplay formal structures and they try to achieve coordination through social norms and reward schemes rather than through hierarchical control [37]. To have any chance of winning the race of the innovation process, management have to develop the creative potential of the organisation and this can only happen by fostering cooperation and managing uncertainty [42]. There is a clear implication here that the innovation process is a people process and in such context knowledge producers need to be reinforced towards new knowledge creation. Nevertheless, there is little research evidence on how effectively KIOs use the knowledge they own as a stock of expertise rather than a flow of information [37, 14]. Hence in this paper we focus our research interest on knowledge-sharing practices evolving in the dynamic environment of teams used as the most effective tool towards the best exploitation of tacit and explicit knowledge in KIOs.

2.3. Virtual Teamwork: Key success factor 1 in KIOs

It is argued that the need for creativity and innovation in knowledge-intensive organisations creates new institutional demands not only in the structural context of the organisation but the social as well; thus predictable relationships and consistency in behaviour and thinking have to be developed [35, 14]. To meet the new challenges effectively, organisations need to transform themselves more rapidly than ever before while at the same time they typically have to maintain operational continuity during change so that they can fulfil their customers' needs for service [19]. In these respects, one key aspect of success into organisational change and development is the prevalence of team

working as a participative approach with high potential value. Team working is suggested to act as a crucial driving force with a tremendous impact both on the individual's performance and the organisation's productivity [44].

With the introduction of electronic technology underpinning the team-based working practices in organisations a gigantic leap forward has been taken and the enhanced development of collaborative networks where virtual teams thrive for success depict the new reality. Since the barriers of the centralised organisation roof were crossed with the use of information and communication technologies, virtual teams have been integrated successfully in organisational practices and used as the basic tool towards the enhancement of highly valued opportunities for increased productivity and better organisational performance [24, 12].

Virtual work as a notion can be realised either in the picture of an organisation lacking a discrete structure [43], or in the role of teleworking where domestic reasons appear to predominate as a response to issues raised in the traditional office [17] or even in the form of the virtual organisation where management is driven through intellectual capital and learning is seen as a key component [36]; most importantly, over the long term, knowledge-intensive organisations increasingly embrace virtual teamwork practices as part and parcel of their internal strategic development process. As the foregoing implies, any form of organising that arises 'virtually' – that is, with the support of ICTs to transcend time and space boundaries – has a main aim: the attainment of shared goals which in effect will continuously enrich the repository of organisational knowledge.

2.4. Knowledge sharing: Key success factor 2 in KIOs
Nonaka and Teece [29] explain how knowledge sharing becomes a central activity at the organisation's heart: Thus, as they state, within the knowledge-intensive organisation shared practice enables individual team members with heterogeneous understanding, insights, information and knowledge to develop a shared world view and use the organisation as the central locus of shared identity formation, hence knowledge creation and flow. From the customer's perspective, knowledge-intensive organizations aim at developing strong ties with their customers in the long run; this perception is realised in a day-to-day process, which encapsulates the attainment of the customer's satisfaction with specific projects. Repeated interaction gradually replaces impersonal cooperation, thus even person-to-person ties are developed [29].

However, although KIOs allow their customers' relations to dominate strongly, yet, it is witnessed that they may lose key technical experts [37]. Many organisations have to cope with an increasingly big gap between 'what they know' and 'what they do' [2]. Management plays a crucial role in realising the communication and collaboration needed in a knowledge-intensive organisation, despite physical distance and temporal nature of employee relationships. However, to evaluate the knowledge capability base of the organisation and examine possible ways of closing the gap is not an easy task for the manager, especially if they have to operate in the fluid context of virtual environments [41].

2.5 Managing the brainpower: Key success factor 3 in KIOs
There is much talk about the potential of managing in the cyberspace. In some cases technology is aligned with self-organisation and autonomy creating an implicit opposition between individual freedom on one side and individual subjection to formal organisational structures on the other [29].

In this context, according to some authors, the manager has to be transformed into an inspirational leader whose job will be not to know everything and decide everything but instead to create a climate at the team's level that will encourage people to share their knowledge and act on their own initiative [2]. Thereby, the organisation can more easily develop a culture of '*sharedness*' in which socially generated emergent cognitive and learning processes and new shared mental models will evolve, instead of attempting to predetermine learning outcomes [10, 32]. Establishing a climate of *sharedness* and reciprocity despite the barriers of time and space, knowledge sharing has to be treated as an organisation's culture issue where the managers have to reinforce new norms and reflect on the team's expectations with their actions rather with their words simply because *"…knowing comes from doing and teaching others how"* [2: 120].

3 KNOWLEDGE MANAGEMENT IN KIOs AND THE ROLE OF TRUST

3.1 The role of trust
The processes of knowledge creation and knowledge sharing in knowledge-intensive organisations have become enamoured with the management of social processes at work [2]. Steil et al [38] build on this perception showing through their research that different forms of interaction are essential; thus, intensive socialisation practiced in the rotation of experts over different sites and the stimulation of 'thinking aloud' becomes a central activity for organisations. On these grounds, Nonaka [28] and Sveiby [40] emphasise that knowledge, unlike information, is embedded in people so knowledge creation occurs as an interactive process. As we look at the future it becomes

clear that information flow grows and technology underpins this process to a great extent [11]. However, despite its availability, technology on its own cannot improve the consistency and effectiveness of knowledge use throughout an organisation, simply because people work in a social context. Hence, the challenge for managers is that creating and leveraging knowledge in the virtual space involves much more than technology.

In order for the collaborative relationships to develop by e-communication, a fundamental prerequisite is the development of strong linkages based on trust among the virtual team members [2, 22, 5: 216]. Although it is argued that building trust is impossible without face-to-face meetings [18], there is also a perception holding that trust can be created in a virtual setting [21, 20]. Based on Stephen [39], Ishaya and Macaulay [20] list five dimensions of social trust, each with a set of characteristics and building blocks, together painting a vivid picture of how members of an organisation should behave in order to create trust, but, the lists also read as a slightly utopian description of desirable social behaviour in any social context (Table 1).

Table 1: *Dimensions and building blocks of social trust (Ishaya and Macaulay 2002: 152)*

Dimensions	Characteristics	Building blocks
Integrity	Honesty, truthfulness, loyalty, faithfulness, and commitments.	Being honest, being straightforward, keeping promises, being faithful and truthful, timely response, being reliable.
Ability	Interpersonal knowledge, skills, and experiences, competence.	Demonstrating personal knowledge, demonstrating individual and group skills, sharing individual experiences, demonstrating personal competence
Openness	Willingness to share ideas and information freely.	Informing members, sharing ideas freely, sharing information freely, giving positive feedback, apologising publicly.
Benevolence	Wish to do good, goodwill, and generosity.	Being helpful and supportive to others, being friendly to others, being kind and courteous, being considerate to others, empathising with others, praising people for their good works, being humble.
Expectations	Potential gains/losses, reliability, consistency, and judgement.	Being open in one's expectations, compromising individual expectations, being fair in expectations, being consistent on personal expectations.

Ishaya and Macaulay [20] further suggest that, in the virtual team's context, trust can be built merely through three processes:

> *The transparent process:* at this level, the team members just decide to trust each other, because they need each other to get a job done. In this case 'sharedness' is mainly based on assumptions about each other's past experiences, to be confirmed by interaction, socialisation, and learning about each other's behaviour and goals.
>
> *Competence process:* This level of trust can be build by celebrating deliverables, providing positive feedback, demonstrating individual – tangible – contributions to motivate others, and engaging in discussions of who will do what, when and with whom, mastering both problem solving and conflict resolution processes.
>
> *Intensive process:* The intensive process, finally, involves parties identifying with each other's goals, understanding and appreciating the needs of others, by defining common, personal and corporate, objectives and goals. This trust process requires the developing on empathy, familiarity and emotions, to identify and understand similarities in individual motives, values and backgrounds. Affections should be communicated, in order to build a strong community of practice, in which commitment is vigorously expressed.

In all three processes of the model described above there is a clear implication that trust development in a virtual situation is a fragile process as it requires not only the individual's willingness to entrust others but also perceived good will from the organisation for enhanced accountability and openness.

3.2 Management roles in KIOs
It is interesting to note that managers can play an important role in being team members with the explicit task to stimulate the trust processes to happen, as well as applying appropriate control systems. In virtual teams formation, managerial tasks must be included, above and beyond the immediate substantial expertise needed to accomplish a

joint goal. The critical question then becomes: what is the manager's role in the transformation process of knowledge into organisation action? Moreover, at what level of the social interactions within the organisation is identity shared through the development of trustful relationships?

For modern, flexible organisations, mostly output and input control systems are regarded to be suitable [13]. McCalman and Paton [25: 125] identify the situation as problematic when they claim "*We have met the enemy, it is us*", noticing that an essence of rigid control prevails in the attitudes of most managers towards their employees which hinders the development of trustful relationships and open communication within complex, fast-changing organisation systems. Ahmed et al [2] reinforce this view when they argue that the difficulty with the issue of knowledge management underperformance in organisations is related to a mentality of fear that pervades many managers when they are asked to operate beyond their well known task-fragmented managerial processes and rather create and embody a new culture that values not only the generation but the dissemination of knowledge as well.

It is true that 'just' working along the line of a very long list of tasks that need to be carried out in a complex, continuously evolving environment, trust building processes and social interactions could – at best – end up to be a daunting task for most managers. Hence, managers need to change the underlying mental models of their behaviour [1], in order to understand and internalise the *rationale* behind appropriate actions, instead of having to rely on descriptions of such actions in a list of tasks. This links to Argyris and Schön's theory about 'single-loop' and 'double loop learning' [4]; while single-loop learning involves making improvements within an existing set of principles, assumptions and paradigms (in our analysis, the list of actions), 'double-loop learning' suggests that new principles, assumptions, and paradigms are adopted as a reflection on existing practices and experiences.

Nonaka and Teece [29] provide directions for the manager's learning by suggesting that virtual teamwork is a highly important ingredient in knowledge management processes; they further present knowledge creation as a process enacted through continuous interaction among individuals at a micro and macro level in the organisational environment. In contrast to the Cartesian view which emphasises the context-free nature of knowledge, Nonaka and Teece [29] argue that knowledge needs a context, a place to be created, either this is social, cultural or historical. Inspired by the Japanese philosophers Kitaro Nishida [26, 27] and Shimizu [34] they adopt the theory of *ba,* which roughly means place*,* and they define it as

"*...a shared context in cognition and action*" *[29: 22]);*

They further explain that:

"*In knowledge creation, generation and regeneration of ba is the key, because ba provides the energy, quality and places to perform the individual conversions and move along the knowledge spiral*" *[29:22].*

Although knowledge needs a place to be created, the notion of place in the concept of *ba* does not necessarily translate into a physical space, instead it implies a unification of the physical space such as the office space, the virtual space such as e-mail and mental space such as shared ideas. There is a clear implication at this point that the core element in the nature of *ba* is interaction. Thus management can reinforce the development of *ba,* and, therefore, the creation of knowledge by providing the physical space such as meeting rooms or even the cyber space by building up electronic networks and also the mental space by developing common goals. In this respect knowledge is created in the form of high-value information as this is experienced, conceptualised, interpreted and reflected through human participation in the complex practical realities of the organisation system [12].

Therefore, a top prerequisite for the manager's role in knowledge-intensive organisations would be the realisation of the increasingly powerful demand towards the development of an underlying culture of knowledge sharing and trust, in which organisational members will be welcome to operate in an atmosphere of truly free thought, the source of sustained advantage in today's complex organisation forms, towards the realisation of common goals. This managerial role will be explored in two case examples in the next section.

4 CASE EXAMPLES
4.1 Introduction and data collection methods
The examples in this section are meant to clarify and illustrate the above analysis, and are not intended to provide full empirical evidence to 'prove' our conclusions. The CompuNL case is based on data gathered during a longitudinal action research project, between 1997 and 2002 [23]. The main focus of the project was the wide-scale introduction of teleworking and flexible office use. The data for the MediaMakers case were collected within the framework of a master's project by a student and one of the co-authors of this paper. Data in both cases are mainly qualitative and based on interviews and participative observation, though surveys have been carried out to obtain a broad overview over certain aspects of both projects. CompuNL and MediaMakers are very dissimilar organisations,

as Table 2 summarises, but they can both be characterised as knowledge-intensive organisations (mainly in part of the CompuNL case) and seen as relying upon – partly distributed – teamwork.

Table 2 *Characteristics of the case organisations*

Characteristic	CompuNL	MediaMakers
Established in:	Mother company: early 20th century.	1991
Product/service:	Originally product oriented: development of the most advanced hard- and software; since 1993 also shifting to IT-related services and solution provision.	Media design, including web pages, graphical design, art direction, programming, 3D animation and video editing.
Size:	Large: 3.500-5.000 employees (depending on whether daughters etc. are counted as well)	Small: 30, including interns
Management style:	Originally highly bureaucratic, shifting towards flexibility and teamwork	Originally group of enthusiastic, creative, result driven friends, shifting towards more professionalism and project management.

4.2 CompuNL: innovating a bureaucracy

CompuNL is the Dutch branch of a very large international IT company, established early in the 20th century. Originally it was a typical, very big bureaucratic organization, with a lot of paperwork needed to be carried out even for the most trivial tasks; also hierarchical control systems prevailed creating high stress on output control for sales functions as the income rates were partly dependent on individual and group sales. However, since the 1990s, a new wind has been blowing throughout the company: instead of focusing on developing and selling innovative hard- and soft-ware, the company aimed at selling these products as part of their business solutions, shifting their strategic orientation from product-oriented towards service-oriented. Parts of CompuNL can be characterised as knowledge-intensive, since it was very important for the company to be innovative and develop new knowledge based on bringing together experts. Knowledge creation and innovation were important both for product/software development teams and for sales and service teams, although they worked in rather different ways. Thus, in the product development teams, groups of expert engineers aimed at the attainment of 'perfect' solutions', relying on each other's expertise. In this context, it was difficult for the manager to keep the balance between the team's actual effort and the commercial value of their work. In sales and services, though, a highly commercial spirit prevailed, aiming merely at output maximisation in the form of continuously rising sales figures. In this area the entrepreneur's individualistic behaviour usually confronted with an increasing managerial demand for innovativeness through empowerment so that a competitive edge over competitors would be gained; nonetheless it was a demand with no immediate effects on the organization's profitability rates.

To respond to this challenge effectively the management of CompuNL developed the 'E-place' project, an important vehicle in realising a new, flexible way of working. This framework project consisted of four parts:

- Renovation and construction of office buildings; the office spaces were going to be more flexible and activity-oriented.
- Creation of small satellite offices, known as 'Pied à terres'.
- Creation of 'red rooms' (for CompuNL personnel) in customers' buildings.
- E-home: offering facilities for working at home.

Currently, around 3000 employees have some degree of space flexibility, many are home-based, only to visit the office once or twice a week for meetings and some administrative tasks. In this context, virtual teamwork has also been used as a powerful tool towards the enhancement of openness and "sharedness" in the communication practices of CompuNL.

By reinforcing the use of the virtual space in their working practices CompuNL aimed at a more efficient use of their office space, but mainly at a better fit between functional tasks and workplace relationships, so that they could stimulate the physical and mental mobility of their employees. Clearly, the CompuNL management were able to recognise the importance of *ba* in their knowledge management strategic approach, hence, they aimed at bridging the gap between 'what they knew' and 'what they did' [2]. Nevertheless, the attention on creating a shared mental space as part of the notion of *ba* was less obvious within the organisation despite the fact that the extensive use of ICTs facilitated this process to a great extent. This was partly related to the organisation's historical background. The top management, and especially their HR sector, had been trying to change work- and management styles, partly along the ideas behind knowledge management, before and during experimenting with teleworking, but there was little to no positive effect. Brochures on the importance of teamwork, and management development courses failed to impress managers. However, when, based on various demands (e.g. atrocious traffic conditions, distributed clients, use of mobile ICT) experiments with teleworking were carried out successfully; changing the physical space gradually, managers and employees were lured into changing their working styles. The enhancement of teleworking,

however, was thought to have a rather negative effect on teamwork, since the level of frequency in interpersonal contacts amongst colleagues and managers were minimised, no matter if the quality of the interpersonal relationships was still highly valued. Moreover, the HR department poorly supported functional managers in their effort to acquire the necessary new skills, even though this type of support if existed would admittedly exercise a strong impact on their general performance.

The role of trust has not been explicitly identified by CompuNL as a major issue of concern while introducing the flexible work schemes along with managing remote teams. However, several mechanisms underlying the establishment and maintenance of trust were considered, with communication being the most important. Managers of sales teams have an important role in stimulating communication amongst team members, since these are generally rather individualistic people, aiming at maximising their own output. Therefore, managers have to make an effort to realise the maximum team output, by organising communication, and convincing team members of the importance of interaction. Both managers and team members (experts) are rotated over different teams and departments, increasing the potential for trust among different groups. Making good agreements on individual goals and contributions to team output, and keeping promises, is still a struggle, lowering the trust base. For example, in several teams, employees easily decided not to attend a team meeting if they judged something else to be more important (clients would be most commonly ranked first in their list of priorities). From the individual's perspective this was understandable, but this behaviour impaired the group's trustful relationships. Managers and groups have been stimulated to make agreements on the prioritisation of team meetings, to avoid team's falling apart due to being permanently dispersed, loosing sight of what binds them and how creating new knowledge would give the individuals and the company as a whole, a more sustainable head start over competitors.

4.3 MediaMakers: taming the free spirits
MediaMakers is a relatively young Dutch organisation, established in 1991 by their current director/owner. They abide in the dynamic multimedia market, offering clients complete solutions involving media design, including web pages, graphical design, art direction, programming, 3D animation and video editing. It was gradually grown from being a small group of freelance free spirits, working hard on fun products, to an organisation of approximately 30 employees (including some part-timers as well as interns), with an impressive record of large, successful projects. Clients liked them, because anything the client wanted would be realised. Unfortunately, this had as a consequence that, usually, more than the budgeted time was spent on project-based work. As a result the organisation's profitability was considerably lowered. Also, changes while being in the process of completing a project were badly recorded and communicated, resulting in costly misunderstandings. When only a handful of people were working at MediaMakers, this type of problems did not occur, because there was direct communication across all levels. The current size of the company created for managers, as well as employees, an urgent need for less chaos, and more professionalism and structured project management. Then there were some experiments with the development of different departments, but functional boundaries did not mean much to anybody in the organisation, since what mattered most was the product realisation, not who belonged to which department.

Employees were hired based on their particular expertise, as well as the fit between their personality and work style with the organisation. MediaMakers' employees were based in two different buildings, about one kilometre away one from the other. Additionally, some full-time employees worked remotely (as far as Berlin), some other full-timers were collocated at the same office; also there were some part-time teleworkers; finally some others were often away to visit clients' locations. While the playful exterior and interior of their current premises fitted well with the innovative and creative spirit of the company, MediaMakers management felt that the discussion about the design of a new, flexible office should be taken on board. Obviously, the physical aspect of *ba* playing an important role in the working practices of this organisation could be easily explained, if taken together with this company's core business initiative on creativity and graphical design. ICTs were used a lot, but not as extensively as in CompuNL. The managers in this organisation had little to no previous experience in 'traditional' companies, so they did not have to change their traditional management style to a new one well-matched with a KIOs environment. However, it was apparent that at least one of the managers had an urge to control the work of the team members 'hands on'. The manager stated that he would rather communicate his views and feedback on a face-to-face basis than in written form, or even via telephone conversations. Problems related to distance as an inhibitor to their internal communication triggered this manager's interest in initiating an investigation into the possibilities of more efficient teleworking practices. On these grounds, one of the team members stated that she preferred to work at home partly to avoid the manager's immediate and constant interference in her work. Several employees would rather communicate via e-mail, because as they suggested in that way they could save time and cause less interference within their work. The different preferences on provided communication means and the variation of perceived expectations resulted in several misunderstandings and some discontent on both the employee's and the manager's sides. It is finally worth noticing that teams were not explicitly rewarded for the successful accomplishment of their projects, or even people's fruitful contribution to those projects, and their willingness to attain the pre-specified goals, although there were indications that such positive feedback (for example a small celebration for a large project successfully finished) would be highly appreciated.

Despite the fact that the individuals' detailed knowledge of each other's capabilities, skills and expertise enhanced the development of trustful relationships, yet the work-styles were so diverse that combining the pool of creativity into finished products ended up to be a struggle. With the success of the organisation depending on the creativity and innovativeness of a free-spirited workforce on the one hand and the organisation's continuous effort to attain the most competitive production outcome and the complete satisfaction of the customer on the other, while losing profit and potentially losing clients as well, seemed to lead the whole organisation into chaos. An analysis of the organisation had shown that any decision-making processes in project-based work should involve all interested parts so that the effectiveness of their communication channels could be improved; this, in practice, meant that the individual input into projects needed to be better monitored so that people would be prevented from spending more time than what was budgeted on trivial issues, and that the vital importance of clarity on how, when and who to ask for and give feedback would be clearly communicated. There is a clear implication here that managers and employees alike needed to redesign their day-in day-out communication routines, even if that had to be interpreted into a transformation of their organisation structure. However, that was a great challenge for managers to realise which, in effect, could hinder dramatically the creativity and knowledge sharing practices of the individual members. Current plans to use the ever most popular project management tool, PRINCE2, originally developed by the UK Government (Office of Government Commerce), might, however, introduce too much formality, in an essentially successful KIO that had outgrown its infant stage.

5 CONCLUSIONS

The theoretical analysis in this paper led to the assumption that managers have an essential role in creating and maintaining the *ba* needed to make a successful KIO. It is the prevailing task of today's managers to build a culture of knowledge sharing and trust, in which organisational members will be able to work in an atmosphere of truly free thought, towards the realisation of common goals, which will, in effect, enable the development of innovative approaches needed in the current market places towards survival and sustainability. Virtual teamwork is recognised through the empirical evidence as part and parcel of this process in the complex, multifaceted environment of KIOs. The case descriptions show that the manager's role in the collaborative and remote knowledge creation processes of virtual teams is crucial, and they have to find ways out of the seemingly complicated or even incongruous demands and expectations defined both inside and outside their managerial territory.

In both cases it was evident that the physical aspect of *ba* is well used by managers and fully supported by the use of ICTs. However, the mental aspect of *ba*, most directly linked with the enhancement of trust and knowledge sharing within the organisation's context, is less well established and needs to be further exploited.

Managers have an essential role in creating and maintaining the balance between structured agreements and unbound creativity, making sure that creativity is directed towards profit, and that output orientation does not limit knowledge sharing. According to the analysis above, this balance is crucial to be realised by developing openness and clarity about goals and expectations in communication structures; these can become the driving forces towards trust building and maintenance. Moreover, a further conclusion to make through these cases is that managers need to realise that both structure and freedom are important, but they also have to develop the underlying mental models required for successful survival in KIO's complex, turbulent environment.

Continuous involvement with individuals at a macro and micro level would enact a managerial shift away from historical control systems - which are totally ineffective in the modern business environment - towards a dynamic managerial approach of shared experience through which the organisation's inventory of knowledge assets can be managed more efficiently and effectively.

We hope that the current research will contribute to the modern manager's better understanding of the strategic dilemmas they have to cope with in knowledge-intensive organisations; therein managers will become able to transcend the barriers between self and other and embed themselves in the knowledge creation processes in KIOs; reaching out beyond the boundaries of one's own knowledge the individual's ideas can be fused and become integrated with the team's ideas and furthermore with the organisation's mental world.

REFERENCES

1. Adler, P.S. and Borys, B., (1996), Two Types of Bureaucracy: Enabling and Coercive, *Administrative Science Quarterly*, Vol. 41 (1): 61—89.
2. Ahmed, P., Kok, K.L and Loh., A. (2002), Learning through Knowledge Management, Butterworth-Heinemann.
3. Alvehus, J. (1999), Learning in Patches: Telework and the Learning Organisation, *Proceedings of the Fourth International Telework Workshop, "Telework Strategies for the New Workforce"*, Tokyo: 121—132.
4. Argyris, C. and Schön, D., (1978), Organizational Learning: a Theory of Action Perspective, Reading, Massachusetts: Addison-Wesley.
5. Bal, J. and P.K. Teo (2001), Implementing Virtual Teamworking: Part 2 – A Literature Review, *Logistics Information Management*, Vol. 14 (3): 208—222.
6. Burnes, B. (2000), *Managing Change: A Strategic Approach to Organisational Dynamics*, Financial Times: Prentice Hall.
7. Carlisle, Y. (2002), Strategic thinking and knowledge management, in: Little, Stephen, Paul Quintas and Tim Ray (eds.) (2002), *Managing Knowledge: An Essential Reader*, Sage Publications: 122—138.
8. Carnall, C. (2000), Managing Change in Organisations, Prentice Hall.
9. Chapman, J.A. (2001), The work of managers in new organisational contexts, *The Journal of Management Development*, Vol. 20 (1): 55—68.
10. Clapp, R., and Cornelius, N., (2003), New Views on Equality Action in Organisations", Working Paper presented at the *Sixth Congress of the European personal construct Association*, March 24-27, Florence "Psychological Constructions of the Social World".
11. Dainty, P., and Anderson, M., (2000), Mindsets for Managers. In Chowdhury, S. (ed), *Management 21C: The future of business will be different-whose version are you reading?*, FT Prentice Hall.
12. Davenport, T.H., (1998), Successful Knowledge Management Projects, *Sloan Management Review*, Vol. 39 (2): 1—20.
13. Depickere, A. (1999), Managing virtual working. Between commitment and control?, in: Jackson, P.J., *Virtual Working: Social and Organisational Dynamics*, London: Routledge: 99—120.
14. DeFillipi, R. (2002), Organisational models for collaboration in the new economy, *Human Resource Planning*, December, Vol. 25 (4): 7.
16. Ekstedt, (1989), in Starbuck, W. H. (1992), Learning by Knowledge-Intensive firms, *Journal of Management Studies*, November, Vol. 29 (6): 713-740.
17. Haddon, L. (1998), The experience of teleworking: a view from the home, in: Jackson, P.J. and J.M. van der Wielen (eds.), *Teleworking: International perspectives; from telecommuting to the virtual organisation*, London: Routledge: 136—143.
18. Handy, C. (1995), Trust and the virtual organization, *Harvard Business Review*, Vol. 73 (3): 40—54.
19. Huy, Q. N. (2002), Emotional Balancing of Organisational Continuity and Radical change: The contribution of middle Managers, *Administrative Science Quarterly*, March: 1—27.
20. Ishaya, T. and L. Macaulay, "The Role of Trust in Virtual Teams", *Electronic Journal of Organizational Virtualness*, 140—157.
21. Javenpaa, S.L., K. Knoll and D. Leidner (1998), Is anybody out there? Antecedents of Trust in Global Virtual Teams, *Journal of Management Information Systems*, Vol. 14 (4): 29—64.
22. Lane, C. and R. Bachman (1998), *Trust within and between organizations: conceptual issues and empirical applications*, Oxford: Oxford University Press.
23. Limburg, D. (2002), *Making Telework a Reality*, Enschede: Twente University Press.
24. Lipnack, J. and J. Stamps (1997), *Virtual Teams*, John Wiley & Sons Inc.
25. McCalman, J. and R.A. Paton (2000), *Change Management: A Guide to Effective Implementation* (2nd edition), London: Sage Publishers.
26. Nishida, K., (1921), An Inquiry into the God, Abe, M., and Ives, C. (trans) (1990). New haven/London: Yale University. In Nonaka, I. and D. Teece (eds) (2001), *Managing Industrial Knowledge: Creation, Transfer and Utilisation*, Sage Publications: 13—39.
27. Nishida, K. (1970), Fundamental Problems of Philosophy: the World of Action and the dialectical World. Tokyo: Sophia University. In: Nonaka, I. and D. Teece, D. (eds) (2001), *Managing Industrial Knowledge: Creation, Transfer and Utilisation*, Sage Publications: 13—39.
28. Nonaka, I., (1994), A Dynamic Theory of Knowledge Creation, *Organisation Science*, 5(1): 14—37.
29. Nonaka, I. and D. Teece (2001), *Managing Industrial Knowledge: Creation, Transfer and Utilisation*, Sage Publications.
30. Nooteboom, B. (2002), Institutions and Forms of Co-ordination in Innovation Systems, *Organisation Studies*, Vol. 21 (5): 915—934. Copyright 2000 Walter de Gruyter und Co.
31. Papacharalambous, L., and P. Jackson (2002), Creating learning and knowledge sharing: The challenge for managers in today's e-environment, *Proceedings BAM Conference 2002*.

32. Papacharalambous, L. and N. Cornelius (2002), Knowledge generation in knowledge-intensive organisations: The transformation of culturally manipulated knowledge workers into active participators, Working Paper, *International Conference New Work 2002*, Spain.

33. Quinn, J., Ph. Anderson, and S. Finkelstein (2002), Managing professional intellect: Making the most of the best, in: Little, et al (eds.) (2002) *Managing Knowledge: An Essential Reader*, Sage: 335—348.

34. Shimizu, H. (1995), Ba Principle: New Logic for the real-time Emergence of Information, *Holonics*, 5 (1): 67-79. In: Nonaka, I., and D. Teece (eds) (2001), *Managing Industrial Knowledge: Creation, Transfer and Utilisation*, Sage Publications: 13—39.

35. Skyrme, D. J. (1999), *Knowledge Networking: Creating the Collaborative Enterprise*, Butterworth-Heinemann.

36. Skyrme, D. J. and D.M. Amidon (2001), The Learning Organisation, in Stephen Little, Paul Quintas and Tim Ray (eds.) (2002), *Managing Knowledge: An Essential Reader*, Sage Publications: 264-271.

37. Starbuck, W. H., (1992), "Learning by Knowledge-Intensive firms", *Journal of Management Studies*, November, Vol. 29 (6): 713—740.

38. Steil, Andrea V., Ricardo M. Barcia and Roberto C.S. Pacheco, An Approach to Learning in Virtual Organizations, *Electronic Journal of Organizational Virtualness*: 69—88.

39. Stephen, P. Robins (1998), "Organizational Behaviour: Concepts, Controversies and Applications", Inc. New Jersey: Prentice-Hall.

40. Sveiby, K., (1997), The New Organisational Wealth, San Francisco: Berret Koehler. In: Nonaka, I., and Teece, D. (2001), *Managing Industrial Knowledge: Creation, Transfer and Utilisation*, Sage Publications.

41. Townsend, A., M., S.M. DeMarie and A.R. Hendrickson (1998), Virtual Teams: Technology and the Workplace of the Future, *The Academy of Management Executive*, Vol. 12 (3): 17—31.

42. Trott, P., (2002), Innovation Management and New Product Development, *Financial Times* - Prentice Hall.

43. Venkatraman, N. and J.C. Henderson (1998), Real Strategies for Virtual Organising, *Sloan Management Review*, Vol. 40: 33—48.

44. *Whybrow, A. C., and S.K. Parker (2000), Introducing Teamworking: Managing the Process of Change, In: Procter, Stephen and Frank Mueller (2000) (eds) (2000), Teamworking: Management, Work and Organizations,* Macmillan Business: 103—124.