

# **PHYSICAL SPACE – THE MOST NEGLECTED RESOURCE IN CONTEMPORARY KNOWLEDGE MANAGEMENT?**

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*‘Nothing new that is really interesting comes without collaboration’*  
James Watson, joint discoverer of double helix

*‘Inhabited places of knowledge have 3 factors:  
people  
spaces  
information’*

(Marco Susani, architect, 1997)

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<b>1</b>	<b>INTRODUCTION .....</b>	<b>3</b>
1.1	CONTEXT .....	3
1.2	TRENDS IN ORGANISATION.....	3
	1) <i>Temporary, timebounded units</i> .....	4
	2) <i>New forms of partnering in research</i> .....	4
	3) <i>Self organising units</i> .....	4
	4) <i>Exploiting moves</i> .....	4
1.3	THE NATURE OF OUR ENQUIRY .....	4
1.4	A SHORT DEFINITIONAL NOTE.....	5
	1) <i>Knowledge work</i> .....	5
	2) <i>Space versus place</i> .....	6
<b>2</b>	<b>CONTEXT .....</b>	<b>6</b>
2.1	WORKSPACE PLANNING.....	6
2.2	PROCESS ARCHITECTURE .....	7
2.3	MAPPING SPATIAL BEHAVIOUR .....	8
2.4	TEAMS AND COLLABORATIVE BEHAVIOUR .....	8
2.5	ORGANISATIONAL BEHAVIOUR .....	9
2.6	INFORMATION AND KNOWLEDGE BEHAVIOUR, INCLUDING MEDIA AND SENSEMAKING .....	9
2.7	ARCHIVES AND COLLECTING, ART AND ARTEFACTS .....	11
	1) <i>Kinesthetic memory</i> .....	11
	2) <i>Documentation</i> .....	12
	2) <i>Kunst- und Curiokammer</i> .....	12
<b>3</b>	<b>PROJECTS AND SPACE .....</b>	<b>12</b>
3.1	TYPES OF PROJECT SPACE.....	12
3.2	PROJECTS AND PURPOSE.....	13
3.3	PROJECT SPACES, SPECIALIST PROJECT ROOMS.....	14
3.4	PROJECT ENDPOINTS .....	15
3.5	ARCHIVING PROJECTS – THE ROLE OF DOCUMENTATION .....	15
3.6	PROJECT SPACES AS ‘THIRD SPACES’ .....	16
<b>4</b>	<b>CASE STUDIES .....</b>	<b>17</b>
4.1	PROJECT AND RESEARCH‘LABS’ .....	17
	1) <i>BBC Digilab</i> .....	17
4.2	WORKPLACE LIBRARIES .....	18
	1) <i>A public sector knowledge management unit</i> .....	18
4.3	THIRD SPACES .....	19
	1) <i>London International Festival of Theatre (LIFT) Business Arts Forum</i> .....	19
<b>5</b>	<b>CONCLUSIONS, FUTURE LINES OF ENQUIRY.....</b>	<b>21</b>
5.1	CONVERTING PROJECT TRACES TO COLLECTIVE MEMORY .....	21
5.2	CONSTRUCTING PROJECT ARCHIVES IN A CONSCIOUSLY NON LINEAR WAY .....	21
5.3	TRANSFORMING THE ROLE AND DESIGN OF “WORKPLACE LIBRARIES” .....	22
5.4	PHYSICAL AND VIRTUAL PROJECT SPACES .....	22
5.5	FLEXIBILITY AND RESPONSIVENESS .....	23
5.6	DECISION MAKING.....	23
	BIBLIOGRAPHY .....	24

## 1 INTRODUCTION

### 1.1 Context

There is a substantial literature on the management of projects, but very little of this is concerned explicitly with the management of knowledge in, and particularly after, projects. Project management theory tends to be dominated by the role of information, as opposed to knowledge. There is also surprisingly little discussion of the role of physical space in project management, although ‘virtual space’ has been attracting increasing attention. Our emphasis has been on projects where increasing emphasis on virtual space has actually served to accelerate interest in the complementary, and often central, role of physical space. We therefore have three overlapping and intersecting areas of concern – projects, the management of knowledge in projects, and the specific contributions of physical space.

In a previous paper on knowledge and space (Ward and Holtham, 2000) we pursued an enquiry into three questions:

- How are deeply instinctive, individual, unpredictable *tacit* knowledge processes made visible and effectively harnessed (which is not the same as managed)?
- How is the collective outcome of knowledge creation to be distilled in such a way as to maintain its relevance to that point in time, but also (without losing context and the contributions of individuals) to form part of an evolving history that inform future decisions and judgements?
- What is the role that physical space design can play in answering these questions?

Some of the comments raised at the presentation of the paper included:

- What are the implications of the collapse of distance?
- How might our thinking be applied to the design of non physical spaces
- Are we proscribing an approach, particularly in respect of breaking down boundaries, which is not always appropriate?
- What have we observed about the recording habits of individuals?
- What kind of spaces should interdisciplinary teams meet in?
- Can you ever replace real space with virtual space?

In this paper we turn our attention to the nature of projects, project teams and their work, and we hope, during the course of this enquiry, to respond to some of these earlier comments.

### 1.2 Trends in Organisation

We highlight here four particular trends which we see emerging in organisations:

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### 1) *Temporary, timebounded units*

In the first trend, organisations are made up of small, temporary units peopled by individuals from different disciplines and backgrounds (interdisciplinary teams). They are often in different business unit or geographic locations who may be on contract, or may work for a supplier, a client or another firm, or may even be projects such as theatrical performances, movie or TV productions.

These units undertake intensive knowledge work in a bounded period of time (i.e. a project with a beginning, a middle, an overrun, and eventually an end either intended or unintended). When viewed from a knowledge perspective, these experiences rarely pass effectively into a collective memory, even though the stories and histories which are created are fundamental to the whole narrative of the enterprise, or to future productions.

### 2) *New forms of partnering in research*

Within many industries the innovation deficit requires partnering with very differently sized or shaped companies – large pharma with biotech, banks with ISPs or retailer with logistics supplier. These new partnerships call for a shared space of information systems and for very different structures and styles for the inter-company-and-company to employee relationships. Innovation needs to be driven within the relationship and protected without.

### 3) *Self organising units*

Here units, teams or networks organise themselves to strive (unofficially or officially) to fill some kind of ‘civic vacuum’ inside the enterprise, or between entities in order to further a particular cause. We will look at the stories of the BBC DigiLab and the LIFT Business Arts Forum. In these cases, there is no official ‘ending’ which timebounds the project but there is generally some kind of fragility of mandate coupled with ambitious intent, generally because the project is at the edges of the organisation and has to fight to secure attention, commitment, funding, and survival.

### 4) *Exploiting moves*

In this fourth trend, which is sometimes connected with those preceding, the project is itself a building project or a move, where the unit(s) or business areas being moved want to exploit the move itself as a way of instilling new ways of working. We will consider the case of a public sector Knowledge Management Unit.

Our shorthand will refer to all these types of projects, units and networks as *projects* from now on.

## 1.3 The nature of our enquiry

Our enquiry here is:

- How can a project space be exploited as a catalyst for constructing project archives, consciously non linear in the way it captures, classifies and communicates? In the rest of the paper we will refer to this ‘process archive/trace/memory’ as a trace

- How can a project space be exploited as a catalyst for constructing project archives, consciously non linear in the way it captures, classifies and communicates?
- What is the potential to transform the role and design of what are currently referred to as “workplace libraries” into experience archives, especially in the context of entirely paperless document delivery and of emerging experiments with multi-media records?
- What is the role of project space as a ‘third’ space, interdisciplinary, interstitial which provides a neutral meeting ground or perhaps the arena for enlistment and engagement. For example, what is the role of the use of space, the project room, as a drop in for non-team members to become acquainted or contribute to the project activities?

After summarising conclusions relating to each of these themes, the paper concludes by re-connecting the physical space dimension of knowledge management with the other core domains enumerated at the start of this abstract. While physical space is almost certainly the most neglected dimension of contemporary knowledge management, it can ultimately only be analysed in close integration with parallel business domains.

#### **1.4 A short definitional note**

##### *1) Knowledge work*

In our previous paper we limited ourselves to knowledge work in businesses. This time we have widened our brief to include public sector and not-for-profit entities in order to detect some patterns and draw some parallels.

In that paper, as in this, we focused in an unjudgmental way on work activities that are dominated by the creation of new knowledge typically of strategic value to the organisation, and to its sharing primarily at managerial level. We are not here concerned with what we define as “information work”, even though we accept that this does also involve knowledgeable workers. We are using the term “knowledge work’ as a shorthand, not as a method of valuing some jobs more highly than others.

Note the distinction we have chosen echoes the distinction made by Jeffrey and Seaton (2000) about the distinction between instrumental knowledge (knowledge to get the job done) and developmental knowledge. We are concerning ourselves in this paper almost exclusively with developmental knowledge of three types:

- that which already exists and needs to be stored
- that in which there is a conscious effort at incremental improvement
- new and different knowledge which emerges from a project

We are also acknowledging the dimensions of knowledge defined by Markus in his seminal work on buildings and power (1993):

Visible –	libraries, museums, collections, artefacts and art
Ephemeral –	dynamic, temporary display, diorama, exhibition
Invisible –	teaching spaces, the audience catches a small fragment of a corpus of knowledge, and the fragment is presented as a dramatic spectacle.

## 2) *Space versus place*

We are adopting the distinction made by Michel de Certeau (1986) who, in his work on stories, makes a distinction between ‘places’ (organised, planned and policed) and ‘spaces’ (determined by actions of historical subjects, temporal, ephemeral, full of meaning).

A lateral link can be made to Innis’s (1951) thinking on time or space societies and McLuhan’s hot and cold technology. Roger James (2000) uses this as a base to interpret ‘place’ as being all about efficiency (repetition, amplification, yield). It is the technology of the computer or the TV and ‘spaces’ as equating to effectiveness (invention, unorthodoxy, innovation) which map to McLuhan’s cold technology and Innis’ time bound society.

## 2 CONTEXT

Primary research on physical space has largely been carried out in very separate disciplinary areas from those business-related disciplines that have been attracted to knowledge management.

This section sets out the main domains of theory and practice which appear to us to have a bearing on the enquiry. These include:

- Workspace planning
- Process architecture and design
- Mapping spatial behaviour
- Teams and collaborative behaviour
- Organisational behaviour
- Information behaviour, including media and representation
- Archives and collections, including art and artefacts

### 2.1 Workspace planning

In the area of property development and design, a new sub-discipline of ‘workspace planning’ has grown up. This itself tends to draw on a wide range of domains including architecture, social psychology and facilities management (Raymond & Cunliffe, 1997). There are a relatively small number of active researchers in this field (Becker & Steel, 1995) with a small but influential group of specialist consultants (Duffy, 1997). Brand(1994) quotes Churchill:

*‘we shape our buildings and afterwards our building shape us’*

He discusses the time evolution of buildings and the 5 shearing layers of change. Brand does this in order to identify the timescales of the components of a building, in the same way that the use of space carries the organisational and project structures with it:

*site>structure>skin>services>space plan>stuff.*

In email conversation, we have added to this (James, 2000) the knowledge cycles of the use of a space

*socialisation>study>serendipity*

Peter Cochrane {Computer Weekly, 2000) argues against the case for dispersion:

*“so why do we go to the office? You don’t go to the office to work – you go to work to be interrupted”*

And what goes in the space? Schrage (1995) refers to an essay by Ivan Illich on tools, and develops the notion of ‘tools for conviviality’. Illich, according to Schrage, stresses that tools are not dependent on level of technology: a telephone can be as convivial as a pair of scissors. Much of our direct experience reinforces this. At a Sparknow exhibition on knowledge management earlier this year (28<sup>th</sup> March 2000) the centrepiece, the central collaborative tool of the evening, was a garden shed.

## 2.2 Process architecture

The traditional educational model is a didactic one – the sage on the stage. Modern education sees learning as a partnership. This holds true for architectural design practice which is moving from didactic to participative. Horgon, Schon and Porter (1998) introduce the notion of ‘process architecture’ and develop a framework and methodology for this as a design process which can be used to simultaneously improve both the workplace and the associated working practices:

*‘Process architecture shapes and guides the workplace-making process. This goal is a dynamically coherent workplace, which we define as one in which work and workplace are joined in a potentially reinforcing relationship. Each changes according to its own rhythm, and each affects the other. The term ‘process architecture’ implies that working towards workplace transformation is itself subject to careful design and craftsmanlike execution...Everything that impinges upon the transformation of the workplace may itself be changing. At first glance, this would appear to create a hopeless unmanageable situation.’ (p.38)*

In developing the framework and methodology, the process draws particularly on John Dewey's notion of design enquiry:

*‘Uneven development of a workplace is a situation in which intelligent human beings, engaged in transaction with their environment, create a new or modified artifact through collective thought and action. This process, however, does not fit the familiar technical-rational approach: It does not begin with a clear objective and proceed systematically through increasingly specific choices, toward a final design. Rather, like a pinball game, it follows a bumpy course, bouncing back and forth between participants, to its final resolution. Innovation in one area gives rise to unanticipated tensions, and difficulties. These, in turn, may be addressed, and perhaps resolved, in new rounds of concerted thought and action....*

*By enquiry, Dewey means something more than the colloquial notion of investigation. For him, inquiry is a process of intertwined thought and action that begins with doubt about a situation that is confusing, complex, or full of conflict: a ‘messy’ situation. The process of inquiry moves through thinking and doing to a definition of the problem and*

*to its resolution through action. Problem resolution in turn generates new doubts which must be addressed through further rounds of the same inquiry process.’ (p.51)*

This ‘messiness’ seems to us pertinent for project activities as well as for workspace projects. Schrage (1995) quotes John Cleese as saying that most inventive ideas in the Monty Python team started with a mis-interpretation of something someone had said.

### **2.3 Mapping Spatial behaviour**

Related to, but distinctive from, workspace planning are geographers and architects who are concerned with actual human behaviour in the built environment. One of the leading researchers in this field (Penn et al, 1997) has developed a methodology for tracking the movement of users in open spaces, and in closed spaces such as offices. Such work is able to yield valuable insights into the detail of face-to-face relationships. A similar approach can now be readily applied to electronically supported relationships. Powerful software tools such as Netmap, enable the tracking of email or telephone communications, building up to reconfigurable maps of relationship networks (Savage, 1998). De Michaelis et al (1999) draw on ethnography to analyse the balance between physical and virtual workspaces, and develop the idea of technology support to create “weakly augmented reality”.

### **2.4 Teams and collaborative behaviour**

Schrage (1989) observes the improvisational nature of much teamwork:

*‘what is the procedure for that?’ ‘There wasn’t one...So we made it up as we went along’*

He points out that the word communicate derives from the Latin ‘communicare’ which means to share, and stresses the importance of nonverbal cues in communications. Nearly all teamwork operates at all three levels of developmental knowledge, and particularly at the level of creation of new knowledge. Schrage quotes Dykstra, movie special effect pioneer:

*‘In ordinary communication...your’ trying to tell someone something you know: apples are apples and oranges are oranges. But when you say ‘Let’s make something you’ve never seen before’ then apples and oranges take on a completely different significance. Now, you’re both trying to create something you don’t know. So you try to get a communal mind going; you want to get people’s minds to interact as components of a larger mind – one person’s logical sense, one person’s visual sense, another person’s acoustic sense. You get a communal brain. What matters is not just the individual talents, but the ability to integrate them.’:*

The critical importance of language and conversation in collaboration and effective communication which Schrage observes in respect of teams is even more true of projects:

*‘Not all conversations carry seeds of collaboration, but not all collaborations are conversations, either. A snatch of music, a lyric, an intriguing diagram, a provocative*

*paper can provide the cornerstone of a collaborative effort. We don't just collaborate with people; we also collaborate with patterns and symbols people create. Artists, writers and musicians are influenced by the work of peers and predecessors. Scientists are guided by the theories and experiments of their colleagues.'*

In the chapter on building collaborative architecture Schrage identifies two basic design themes:

- collaborative tools and environments aren't just designed to support individuals or groups or meetings – they are designed to support relationships, and
- collaborative architectures support a process, not an output.

## 2.5 Organisational behaviour

Schein (1992) examines the visible and invisible layers of organisational behaviour, although interestingly he touches less on the ephemeral . A visual interpretation of Schein's work might look as follows:

organisational layers :

	SCHEIN LAYER	CHARACTER	COMPONENTS
visible		artefacts	hierarchies protocols documents
middle		espoused values	strategies rules philosophies
invisible		underlying	assumptions unconscious beliefs

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**Fig 1: Schein, interpreted by Sparknow.**

## 2.6 Information and knowledge behaviour, including media and sensemaking

Boisot (1995) describes knowledge as moving through the information space:

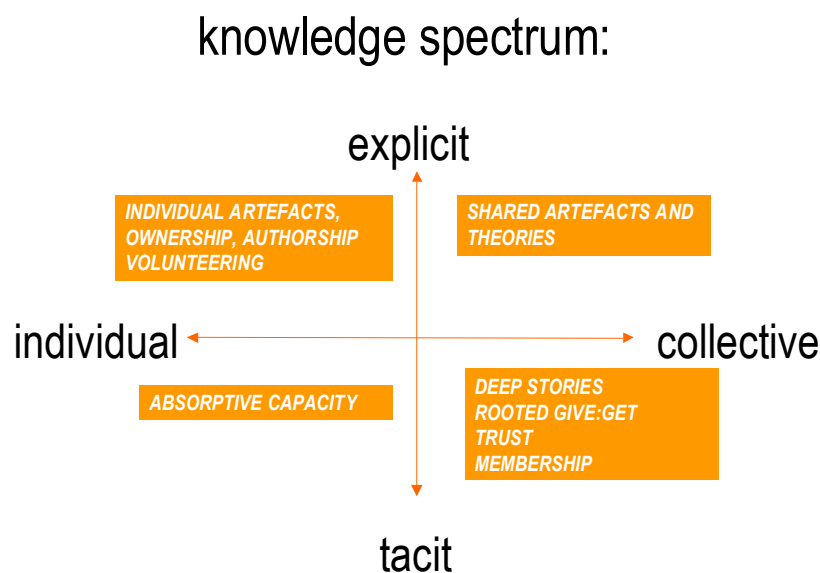
*‘new knowledge can be describes as a clockwise, cyclical movement in the information space that can be decomposed into six distinct components.’*

These components are

1. scanning
2. problem solving
3. abstraction
4. diffusion
5. absorption
6. impacting

Nonaka and Takeuchi’s (1995) work is now so familiar as to verge on cliché. Japanese companies can claim success in innovation which is primarily teamwork knowledge transfer (i.e. Boisot’s codification) but are less good in invention. The ‘cookie cutter’ approach for converting tacit knowledge is appropriate for transferring what is known, but it is not appropriate for synthesising new knowledge. It is here that, amongst other thing’s Boisot’s abstraction, or McLuhan’s ‘cold media’ are more relevant.

We have attempted a consolidation of these various considerations of knowledge and space in the following diagram, which although impoverished by the limitations of two dimensions, nevertheless describes at least in part the combination of components which need to be considered in any consideration of knowledge and spaces, physical, personal and virtual.



spark 1999, derived from nonaka and takeuchi 1995, snowden 1999

**Fig 2. Sparknow knowledge spectrum 2000**

Becker (2000) writing on dispersed knowledge points out that:

*'Although Hayek has pointed out the phenomenon of dispersed knowledge long ago, adequate strategies in dealing with the implications of dispersed knowledge have not been developed yet. This is true even although the problem of managing dispersed knowledge has become more and more salient, most prominently in form of dispersed teams.*

***Management approaches require conceptual frameworks. Those, however, are in short supply with regard to the problem of dispersedness.. The reason is that the behavioural implications of dispersedness of knowledge have so far been greatly underestimated and overlooked in the knowledge management debate.'***

(our bold type)

Dispersedness of knowledge is clearly a major issue for projects both during their lifetime and after they have ended. And the challenges continue despite the growth of technologies which offer the prospect of providing solutions, albeit partial. We would also extend Becker's debating arena from knowledge to include the information, IT and virtual company debate.

Ambiguity, multi-media, multiple representation and sensemaking are also extremely important characteristics of projects – how are learnings to be captured and transmitted; how are points of view to be maintained; what media, tools and techniques can be used in the physical space which will create a substantial trace? (Lanzara and Partiotto, 2000, Weick 1995)

## **2.7 Archives and collecting, art and artefacts**

### *1) Kinesthetic memory*

Markus (1993) makes a distinction between museums/collections and teaching/learning spaces:

*'Because a museum is a classifying device, by moving through its space the visitor recovers the entire system. In the auditorium the visitor is stationary and recovers a fragment of the system'*

Gardner (1983) emphasises the significance of the kinesthetic as a vital component of intelligence. Negroponte (1996) talks of kinesthetic memory. For example, we remember phone numbers by the sequence of finger movements and have to 'replay' this in order to transcribe the number if asked. Relating classes of knowledge, even individual books, to space, is closely linked to the techniques for memorising. Frances Yates's (1966) account of 'The Art of Memory' describes the techniques of memorising which associated facts or ideas with specific places in a building. These culminated in Camillo's famous sixteenth century memory theatre in which the whole world, natural and supernatural, is represented in a seven-tiered semi-circular building, to be viewed from the normal stage position. Similarly the most creative and imaginative sessions tend to encode a visual dynamic. The museum model allows a kinesthetic approach to memory.

## 2) Documentation

This distinction does not hold for project spaces which face the simultaneous challenges of acting, improvising, responding, sharing and communicating, capturing a selective but comprehensive collection of tools, records and experiences which will form a pertinent history. (Field, 1999) The role of documenting then becomes key. In notes taken at an ICA lecture on the role of the web archivist, Ward (1997) recorded the following observations on the challenge:

*'Documenting the ephemeral? Notions of museums, library, archiving will be convergent. There will be a move to documentation as a primary representation of art and artefacts. Art and documentation are now inseparable. There are issues around preserving, managing and disseminating the documents. Keeping a trajectory.'*

## 2) Kunst- und Curiokammer

We have found it useful, in forming our thinking to draw history and the relationship between different building types and knowledge. This has led us to examine the history and purpose of different types of knowledge repository from museums, libraries, medical schools to small repositories such as the art and curiosity cabinets which came into vogue as travel and discovery grew in the sixteenth century. Markus (1993) quotes Bacon's 1594 four part prescription for a repository of knowledge, which includes:

1. a library
2. a zoological and botanical garden
3. an experimental laboratory and
- 4 *'a goodly huge cabinet, wherein whatsoever the hand of man by exquisite art or engine has made rare in stuff, form or motion; whatsoever singularity, chance, and the shuffle of things hath produced; whatsoever Nature has wrought in things that want life, and may be kept; shall be sorted and included.'*

Christopher Alexander (1977) defines the spatial templates and rules for layout – perhaps the rules on place themselves are a template on space – sort of the round table phenomenon.). Individual artefacts or collections can be important tools (in the Illich sense of tools and conviviality) for communication. Schrage (1995) tells a story of Jonathan Miller, the theatre director, who, unable to draw, keeps an archive of 3000 postcard and uses faxes of these to communicate with designers who are doing his set design. In our previous paper we started to develop this theme with reference to some work on unburied time capsules which we have come across in one organisation.

## 3 PROJECTS AND SPACE

In this section we seek to draw together the research from the domains we have referred to, and bind these into some criteria for considering the knowledge based relationship between projects and space.

### 3.1 Types of project space

These can be categorised first of all by physical presence:

1. Largely co-located, with heavy regular face-to-face contact.
2. Largely virtual, with irregular or virtually no face-to-face contact.
3. In-between positions, e.g. where some members are clustered in one location, with others being geographically very remote.

Projects also tend to require either full time inputs by most or all participants, or by contrast be part-time for most or all participants.

- Movie production
- Theatre production
- Construction
- Scientific
- Product Development
- R&D

The complexity of many modern projects means that special roles have evolved of ‘project management’ or of ‘project coordination’ though the term ‘management’ arguably should be reserved for those with executive control as opposed to coordination duties. Projects and project teams have a series of phases, and the information and knowledge processing dimensions of each phase can be markedly different. Although projects are typically conceived of as collaborative team efforts, some projects are undertaken by a single individual e.g.

Portrait painter

Or pairs e.g.

Comedy (French and Saunders)

Music composition with lyrics (Gilbert and Sullivan, Flanders and Swann)

The discovery of DNA (Crick and Watson)

In some regards, it may even be appropriate to consider the project itself as having the characteristics of an individual. For example, a £20m project could easily justify a dedicated meeting room, at a time when workers whose annual salary is 1% of that sum would typically have a personal office.

### 3.2 Projects and purpose

Projects, and so project spaces, are also characterised by purpose. Collaboration, says Schrage () is a purposive relationship. There is a desire to solve a problem, create, or discover something, within a set of constraints which include:

Expertise – one person alone doesn’t know enough to deal with situation

Time – collaboration is real-time (airplane cockpit) or leisurely (Gilbert and Sullivan), project collaboration often has an end date (project delivery, final performance, publication etc)

Money

Competition

Conventional wisdom (prejudices of the day)

### 3.3 Project spaces, specialist project rooms.

Two conference or meeting rooms may appear significantly the same from a floor plan, but be fundamentally different in practice.

CONFERENCE ROOM TYPE	IN PRACTICE
Small meetings of up to a dozen people Booked for a fixed period of time via a scheduling system	Physical walls, but freely available In practice an open minded space
Within a department. Only freely available to that department	Weakly open-minded
Permanently reserved for a specific project team	Strongly single-minded. Project team ‘own’ the room and fill it with objects relevant to team task, cover wallboards with ideas, plans and humour. This is home.

Covi et al (1998) identify eight types of project spaces:

- Live in project rooms
- Not live in project rooms
- Group areas with commons
- Owned meeting rooms
- Scheduled meeting rooms
- Video Conferencing rooms
- Cafeterias used for meeting
- Training rooms

They studied in depth two of the most common patterns:

- Live in project rooms (skunk works)
- Not live in project rooms (war rooms)

They found that “co-location supported teamwork through awareness, implicit learning, motivation and easing the transitions from individual to group work.”

They identified two important sources of group information:

“**Cognitive artefacts** in use..... which codify procedures and make the project’s progress visible and **behaviour** of team members which models work practices and cues task coordination. Dedicated project rooms make both of these sources handy”.

Some organisations, such as Boeing, have a long history of using project rooms for semi-permanent teams, especially project design teams. They are now being increasingly found in advertising agencies, where a specific room is given over to a campaign, decked out with symbols of the client and/or its intended customers. But in numerous discussions with UK executives generally, we have found a widespread reluctance to dedicate rooms to teams and projects, most typically on the grounds that “we don’t have the space available”. This has an ironic edge. Companies seem prepared to use open reconfigurable space for ‘cubes’ and

fixed space “meeting rooms” for projects. The ephemeral nature of projects and the (perceived) employer-employee relationship would suggest the reverse!. Steele and Jenks (1977) sum up what can be achieved in the best team environments:

*“conversely, we believe that a setting which communicates a sense of joy, of personal markings, and of fun in influencing the setting indicates how the users feel about the social system as a whole. Personal posters, switching of desks, shared visual jokes – all of these help create a mood that reflects positive enthusiasm for being where the members are during their working hours”*

### **3.4 Project endpoints**

Considerable damage can be done to the effectiveness of projects if they get lost in a welter of ‘high priority’ projects in large, monolithic organisations. Roger James (2000b) from NAPP Pharmaceuticals emphasises the importance of endpoints in projects (referring to the innovative productivity of a research team which peaks 8 months after team formation but declines significantly out to 5 years):

*‘In the old days, projects had individual sponsors and end points. The loss of endpoints means loss of early failure. People carry on with things which would, in a smaller, more entrepreneurial set up, have been long abandoned.’*

James (2000b) also points out (in an interesting building metaphor) that pharma companies, in their appetite for merger and acquisition are making

*‘cathedral like edifices. The old days of the laboratory coffee room in which there were journals, journal clubs. There were conversations, dialogues, bits of old sandwich stuck on articles, showing that they had been well thumbed and were worth reading. There was a tealady renowned as a character. All these things are gone and this is for the worse. This loses context, individualisation, commentary, the ‘my point of view is’ which is the very stuff of effective research projects. To lose the intimacy and individuality of research is to make ignorance factories, not knowledge factories’*

### **3.5 Archiving projects – the role of documentation**

We have already referred to our sense of the importance of traditional librarianship skills and tools and their application to projects and project records. For projects to be archived effectively and usefully however, there needs to be a major shift in our understanding of what is to be archived, and how. If all the characteristics of projects as described above hold true, the thing that is being archived is the ephemera of interaction, the tacit social and sensory knowledge that emerges from collaboration and ambiguous, contradictory personal memories and points of view. How is this to be done, and what is the role of the physical space in doing it? Brian Eno has emphasised (Kelly, 1995):

*‘interactive anything is the wrong word. The right word is unfinished’*

This points to a different kind of project record, one which bears in mind the types of documentation (or record) which are necessary;

1. Research
2. Preservation
3. Dissemination.

This can be problematic. Things need context, and to stay connected. It is impossible to conserve the whole project as there is no stable condition. The need for selection, avoiding prejudgement, in such a way that relevance, context and connections are made. Ward (1997) noted:

*'The archivist collects and curates pathways, is a preserver of links, has a passion to preserve, has a desire to develop tools for understanding, to keep that which will yield to understanding. The complex role of the archivist is*

- *preservation and conservation*
- *access – physical/intellectual*
- *intellectual at the meta and data levels.'*

An illustration of this comes from Roger James who described the Memoir Project at Glaxo (the ultimate meta project?). Glaxo developed a system which acted as a citation index but recorded what people were reading, Where there were unusual clusters of reading interests, communities could form. James quotes Roald Dahl's 'Matilda':

*'You read to prove you are not alone '*

This makes a double point about projects, project records and project spaces.

### **3.6 Project spaces as 'third spaces'**

In our last paper we started to develop the notion of third spaces (Oldenburg, 1989) as extremely important for knowledge sharing. In the specific context of project spaces, we think this has even more resonance. Seaton and Jeffry (2000) examined knowledge dynamics, studying interdisciplinary interaction in the company research and development processes. They presented some insights which are relevant to the development of third spaces (although we do not necessarily agree with their distinction between knowledge artefacts and knowledge transfer/processes). In examining how interdisciplinary research teams work, Seaton and Jeffrey identify a dependence on:

Vocabulary  
Metaphor  
Storylines  
Intermediaries (who act as translators)  
Negotiation

They also make the well known point that the knowledge hierarchies in an organisation are different from the organisational hierarchies, and identify two qualities of knowledge domains:

1. They overlap, and where they overlap they can be synergistic and reinforce each other
2. From their overlapping is emergent new knowledge

From this they draw the conclusion that there is an important role in interdisciplinary project teams for elicitation – perception and mapping.

## 4 CASE STUDIES

### 4.1 Project and research ‘labs’ – creativity space

#### 1) BBC Digilab

*‘The BBC does knowledge management for the country ‘*

(Euan Semple, Head of Knowledge Management, BBC)

The BBC’s Digilab was set up shortly after the BBC split production and resources, with a watching brief to keep alert to developments in consumer products so that the BBC might be better equipped to assess their potential impact on programme making. Over the 2 years since it was set up its role has shifted so much that it has now become a pivotal space in the development of a knowledge management strategy. Why was this?

There seem to be two main reasons

1. the way in which the space has been developed, and
2. the way in which the Digilab team have seized the opportunity of the original mandate and the physical space allocated to them, and converted this into a platform for catalysing change.

There are five people in the Digilab team, all from combined technological and creative backgrounds. For example, Euan Semple, its head, is a saxophonist and erstwhile sound engineer in the World Service. It also dawned on them early that they held a rather privileged position of being politically neutral, and of having information and expertise to offer in an area (the fast development of consumer media technologies) where people from all areas of the BBC could happily profess ignorance and were willing and eager to learn.

The team seized the opportunity to convert their research, experience and space into a meeting place. Over the past 2 years some 3,000 have visited, for formal and informal training, discussion and other sessions on subjects such as the impact of Mpeg and DVD. The space itself is around 1500 square feet and divided into four broad areas: the kitchen; an area with workbenches and technology; a comfortable seating area just outside the kitchen; and a session space equipped with most kinds of media for presentations.

The colours are bright, offsetting the lack of views, as the DigiLab is in the bowels of the building. The walls have little on them in the way of notices or fragments of news: news is collected and shared verbally or through the computers. They have their own IT networks which allows them to experiment without jeopardising the BBC network.

The space can house around 25 seated and 40 standing. Sometimes events are limited to the session space, sometimes they take over whole space for ‘knowledge fair’ events. Although larger events can be quite hot and sweaty, the team finds that density works well, so

the informality and proximity forced on them by popular events and the sense of improvisations reinforce their attractiveness.

Now that the DigiLab is assuming a watching brief on knowledge-technologies (for example, taking the lead in experimenting with Autonomy), several issues are becoming clear to them. One is the advantage they have had in building on a platform of acknowledged expertise which can be offered to people to create the initial connection and participation. Another is the importance of an ethic for internal knowledge sharing which is consistent with the external values. Euan points out that

*'People can be arrested for listening to the BBC'.*

Although we have classified this as a *creativity space*, it clearly has many of the characteristics of an internal *third space* as well.

## 4.2 Workplace libraries

### 1) A public sector knowledge management unit

*Email 10<sup>th</sup> October 1999*

*Victoria*

*I note with interest that at the forthcoming 'Workplace libraries' conference in Warwick (at which our team will be represented by Kim. You and Pia are going to hold a workshop about transforming "an everyday workplace library into a place of lively participation, enquiry and creativity, while retaining a core of calm to allow space for reflection and observation".*

*Now, whilst the KMU are not about to design a library we are about to move into a new building where we hope to get some fairly unconventionally arranged space and we have talked about whether we might look to someone with the right design expertise to help us to create exactly what is described above albeit for a Knowledge/Change management team.*

*It is still up in the air about whether we get the space we want or get put onto a very conventional floor. But the challenge will be the same especially since we will have almost no flexibility about the furniture we can use.*

*Fancy talking to me about it? Enjoy the weekend.*

*Pat*

This brief was supplemented in conversation with both Pat and Kim, by the addition that this should be a space which would draw people in, should both encourage and demonstrate new ways of working, with particular emphasis on flexibility, multiple functions and responsiveness; it should invite existing and new individuals to participate, contribute and share. It also, while being fresh and new, needed to be credible in its context, i.e. be firmly grounded in the best theory and practice of knowledge management as an organic, evolutionary, voluntary process, rooted in complexity.

Following this brief, we worked with a theatre designer, drawing on research into process architecture, libraries, archives, curiosity cabinets, theatres and performance, boundaries and creativity (see Ward and Holtham, 2000) to propose a knowledge space which would invite travellers and passersby in to learn. Some of the ideas which were adopted included:

- the use of storable curved screens to define and redefine spaces
- a media wall for reporting internal project news and external intelligence
- a workbench with research work stations
- pulldown screens which could convert the media wall to a projection wall
- use of colour to denote the area, and different colours to denote signage
- possible colour coding of floor spaces to imply different kinds of spaces, and the boundaries between collaborative and reflexive space
- no walls to delineate a difference between space and corridor, so inviting passers-by in
- freestanding display cases with integral lighting, displays to attract people to slow down and look
- flexible, modular furniture where possible.

### 4.3 Third spaces

#### *1) London International Festival of Theatre (LIFT) Business Arts Forum*

*‘Can I explore the nature of your no?’*

This story arose as a direct consequence of our comments on third spaces, authorised and unauthorised space in our Warwick paper. Julia Rowntree, Director of the LIFT Business Arts Forum contacted us to say that our thoughts resonated with her and described in some detail to purpose and structure of the Business Arts Forum which sees itself both as a ‘network without headquarters’, and as having a particular relationship with spaces, especially performance and rehearsal spaces. The Forum exists as an underpinning, but the festival, and the parallel activities of the Forum are both biannual, so there are approximate 18 month cycles of activities with beginnings and endings, with six months in between of slower activity.

#### The Business Arts Forum

*‘provides an opportunity for creative leaders from business and public sector organisations to connect with the thoughts and processes which support the vision of these artists. It is a stimulating meeting place for people from an unusually wide range of sectors and perspectives to tease out the cultural forces shaping their work. The Forum offers....insights into managing risk, leadership for innovation, second-guessing cultural shifts, corporate and team relationships that work.’*

There are several layers of location (and dislocation) and space at which the Forum consciously operates:

Physical Space – the most neglected resource in contemporary knowledge management?

- London, and the strategic issues of exploiting London's cultural assets
- Performance and meeting spaces and their impact on hierarchies and interactions
- The impact of international productions, whether a new airport, a factory or a festival, on a complex local picture
- Local community (mono-location)
- Global corporation (multi-location)
- Art, rehearsal, performance as a means by which to explore values

Julia Rowntree describes the activities of the Forum in the following way:

*' It is a social and cultural experiment, creating a new kind of dialogue between arts business and public sector. It has an intergenerational dimension and includes aspects of coaching, seminars, self examination, reflection space which lifts people out of their fragmented business identities and allows them to reflect on the underlying values of being in business. It inverts the social hierarchy, and normal relationships of power and obligation in post industrial society. It uses the existence of LIFT (which happens every two years) and the fact that the theatre turns power on its head, and allow fundamental living issues (death, grief, power) to be reexamined, to turn normal discussions on their head. It is anthropological, a celebratory setting which also allows a reexamination of the relationship of global and local. The programme of activity includes mentoring, and learning to mentor, seminars, shows, visiting different spaces. The space for the final meeting is hard to find. Last year's was in South Africa House, which was interesting as a space and as a metaphor for changed boundaries. The ultimate goal is to reinvent the notion of the public realm in which we communicate, and beyond that the nature of commercial relationships.'*

Julia is troubled by the fact that in the US, even more than in Europe, the business/corporate and individual identity have been merged, so people can no longer distinguish between their corporate and their real selves. This Forum reasserts the identity of the individual, and the relevance of human values in the workplace (place not space, note). Figure 3, reproduced with LIFT's permission, outlines the approach:

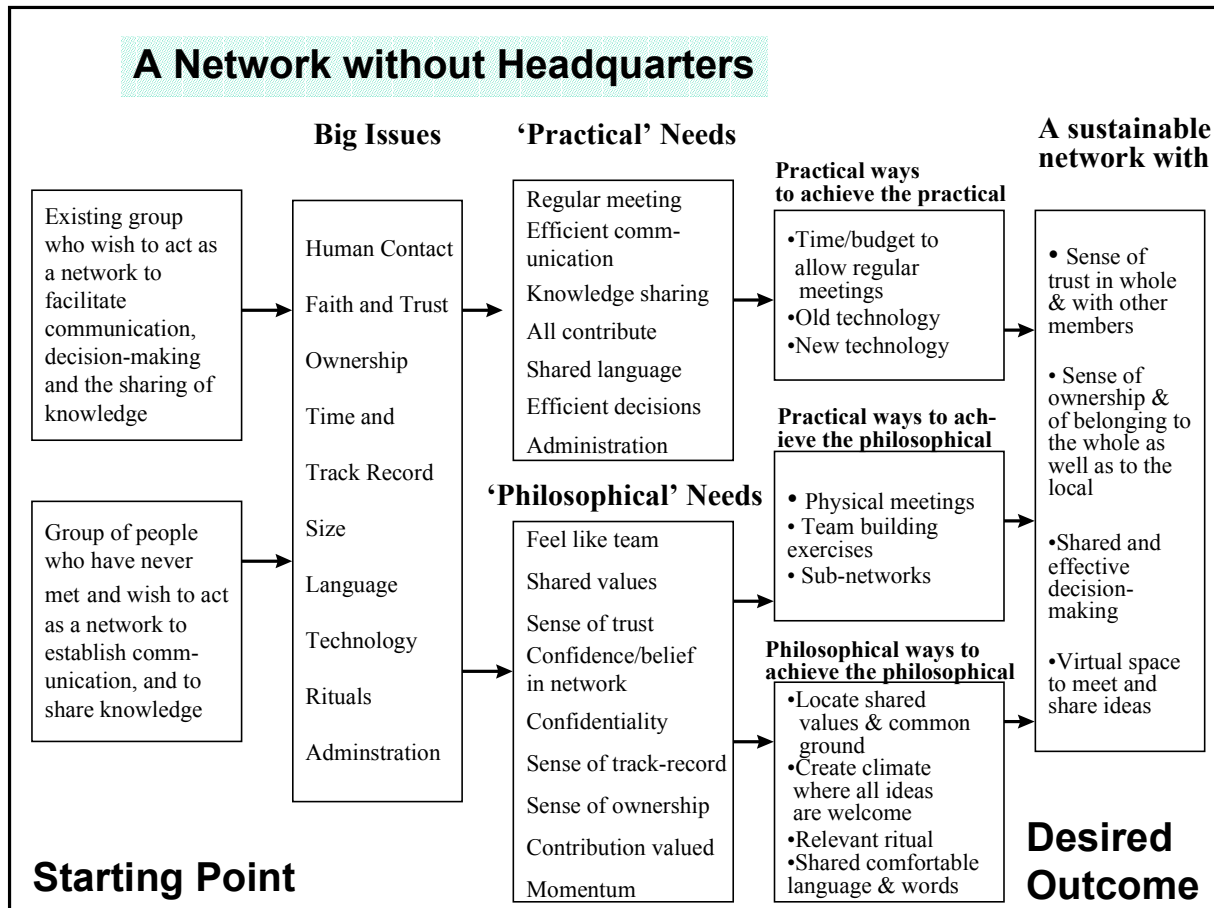


Figure 3: LIFT Business Arts Forum

## 5 CONCLUSIONS, FUTURE LINES OF ENQUIRY

### 5.1 Converting project traces to collective memory

Most of this work comes together with Schrage's thinking on prototyping – that an engineering prototype becomes a physical manifestation of collective ideas and combined energy. In the virtual worlds and for knowledge work no physical focus is possible except for the role of space, whether represented as a book, a 'know how box', a technology, a room or a building.

### 5.2 Constructing project archives in a consciously non linear way

In figure 2 we referred to four quadrants, one of which was explicit/collective, encompassing shared artefacts and theories. Much of the mechanistic approach to knowledge management, especially as espoused by software vendors and systems integrators, over-emphasises computer-based approaches to project traces and archives. Computer systems tend in practice to be much more geared to the processing of information than of knowledge. Computer screens are physically two dimensional, no matter how much 3D worlds can be simulated. The physical world is strikingly three dimensional and includes characteristics such as aroma which cannot as yet be at all satisfactorily replicated electronically.

Electronic information systems, such as those well established in management consultancies, are essential for processing information about projects on a global basis, in a systematised way that supports in particular information search. They also offer good facilities for electronic discussion. They can usefully be augmented by multi-media material, although multi-media can be extremely problematic to index (especially video). But we can clearly see limits on the capability of any electronic system to pass on tacit knowledge about a project, and particularly re-kindle amongst project participants insights and memories of that project.

There needs to be much more experimentation in on-computer methods of retaining project memories. This is precisely because computer-based project information, whilst essential, is also limited as a result of its information orientation and 2D functionality. There is a strong danger of over-reliance on computer-based project information by those who are not aware of its limitations. One clear example of an innovative approach to project memory was the use of a professional story teller in an investment bank (Ward, 2000). Another is the retention and display of one or more physical artefacts which symbolise that project.

### **5.3 Transforming the role and design of “workplace libraries”**

Many businesses which are heavily knowledge orientated are increasing their investments in workplace libraries, but this does not always take sufficient account of the knowledge dimension of that library as opposed to the more clearly articulated and understood information dimension. The classic perception of a workplace library, both by users, senior executives and to some extent by information professionals, is of a combination of physical space and virtual ‘information space’, with a relatively strong unstated assumption that on the whole users are acting as individuals. But interpersonal relations are important to some aspects of knowledge creation, and crucial to many aspects of knowledge sharing. It is therefore possible to evolve the workplace library from being a space for primarily solitary information processing, towards also being a space for collaboratively oriented knowledge creation and sharing, including serendipitous contacts. The very neutrality of the workplace library makes it an ideal ‘third space’, with quite different and complementary characteristics from the informal café space so popular in the latest office buildings.

### **5.4 Physical and virtual project spaces**

Our initial area of interest was the role of physical space in knowledge management, especially relating to the work of project teams. Possibly the most unexpected reaction from interviewees was a sense of relief that the issue of physical space was being put onto the knowledge management agenda specifically, and the business agenda generally. Physical space must be examined in parallel with virtual information spaces, since they are increasingly inter-dependent. The LIFT Business Arts Forum did not have the luxury of meeting as often as its members might wish. It therefore had to be a highly effective user of both ‘old’ and ‘new’ asynchronous communications technologies. And the very infrequency of its meetings means that when they do take place that team building cannot be taken for granted, and formal team building exercises are routinely used.

## **5.5 Flexibility and responsiveness**

Communities/Departments/Teams within an organisation are forever changing. For example they can be: expanding, contracting, merging, on a permanent or non-permanent basis.

If the space has not been designed so that it can incorporate change in working patterns it can become restrictive and ineffectual. It is important that it is flexible enough to evolve and change with a constantly moving work environment that is trying to keep up with the rapid pace of technology.

Office spaces in the past have not been very flexible, The advance of technology now makes this possible, the trouble is nobody has really explored this in great depth, perhaps because technology is moving so fast that people are not totally aware of how many different options and solutions they have at their fingertips.

## **5.6 Decision making**

This enquiry forms part of a larger collaboration we are undertaking to develop greater understanding of the forces which shape both good and poor decisions on spaces for knowledge work. These particularly relate to management awareness on the one hand, and the nature of the consultation process for workspace design on the other hand.

One classic approach to categorising resources is through a four phase evolution. Firstly, physical assets were developed and understood as a resource to be managed. These were followed by the financial assets that accompanied the birth of civilisation. Then very much later were human resources understood as an assets, and only in recent times has the fourth resource – information – been identified (Best, 1995). Clearly each of these resources are blended to support differing modes of production. In an era where the intangible and knowledge economy are responsible for an increasing proportion of production, it is evident that the human and information resources consequently also become of increasing importance. Some of the essential tangible resources of the earlier industrial revolutions, such as power and heavy machinery become relatively less important. But our work suggests that one classic tangible resource – buildings and the space they embrace – can play a vital role in the intangible area of knowledge management. Unfortunately, as our title implies, this is insufficiently widely recognised, and we are concerned that the headlong rush to implement technology-focussed knowledge management solutions will indeed increase neglect of space as an critical element in knowledge management,

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