

Better Library and Learning Space – Trends and Ideas

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Introduction

It's often assumed that responsibility for the redevelopment of spaces and buildings is the responsibility of architects and interior designers. Faced with a refurbishment or rebuild project the library or education professional can easily surrender responsibility for the project to the superior knowledge and experience of these professionals. In reality the role of the architect or interior designer is to serve the needs of the client. Consequently, in the case of a library, the success of the project ultimately depends on the knowledge and vision of the client librarian(s) involved. Being a project client is a tough task. He or she needs to bring together all they know of their profession with what they know of the trends and emerging ideas across the world and creatively synthesise these into a vision of the future that can be explained and supported when challenged by other ideas and competing visions. Taking what is known of the past and the present and extrapolating it into the future is a risky business and fear of failure can be so great that it pushes the client into a safe mediocre approach that disappoints sponsors of the project and users of the building. This paper identifies the challenges to libraries in these early years of the 21st century and the trends and ideas that have emerged in the development of library space as a response to these challenges providing a basis for the process of thinking about what future physical libraries could be like. The paper is structured into three major sections on learning, technology and experience. The trends and ideas covered in these sections are taken from the book *Better Library and Learning Space: Projects, Trends and Ideas* (Watson 2013) that I edited and that contains the thoughts of 26 authors from a wide variety of professions – not surprisingly this paper is inevitably a subset of the book and does not cover include the diverse range of ideas presented by the many contributors.

Setting the scene

There is no doubt that the environment for libraries and their development in the UK and elsewhere has become very difficult since the economic crash of 2008. The first 15 years of this century have seen traumatic financial change – from boom to bust - that has reduced resource availability particularly in the public sector. The impact on public libraries in the UK has been significant. Ed Vaizey the UK Minister for Culture, Communications and Creative Industries in a speech in 2012 claimed the numbers were much better than was commonly thought with 157 libraries closed and a further 225 under threat of closure. Whatever the true numbers are this period of fiscal constraint has been a key factor in stimulating the questioning of the continuation of libraries as physical places. The financial challenge sits in a broader global context of major technological, informational, societal and behavioural changes that also question the need for the physical library. However, judging from press and television reports in recent years, finance does seem to be the most immediate single challenge faced by UK libraries – particularly small local public libraries which, although not closed, show around a 7% reduction in funding between 2008/09 and 2011/12 (LAMPOST 2013) pushing them nearer and nearer to extinction. But press and television reports also indicate that libraries have changed little over the past 50 years and this is confirmed by those protesting against library closures or service restrictions, who construct their arguments opposing change around the library as book repository and place of reading (Horn 2008). It is easy to see how government and local authorities might dismiss protests against library reductions or closures in an age that has more information than ever before being available through more channels than ever before to more people than ever before. 'Between the birth of the world and 2003, there were five exabytes of information created. We [now] create five exabytes every two days' (King 2013) and, thanks to a mixed economy of paper and ebooks, more people are reading than ever before (The Guardian 2011). An important consequence

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for libraries of this massive increase in information resources on the internet is not just that information is their core business and their users will need and want to access it but also that such a resource creates more opportunity for informal personal learning than ever before. This increase in learning opportunities has consequences for libraries. Aspects of 21st century approaches to learning will be touched on later in this paper but for now it is important to note that like schools, colleges, universities, archives and museums, libraries are a key component of the learning infrastructure of a nation. We should also acknowledge that every library is a response to its locality as well as the resources it has and each exists in the context of the broad global factors that are mentioned above – so the points made above should not lead us to believe that there is a single response to the local and global challenges but there are common threads. Libraries have an important role as places of learning and as the internet drives an unmet need for independent personal learning then an increased need for more learning facilitation and support develops that gives libraries an important future and an opportunity to really claim their place in the national learning infrastructure.

To quote Stewart Brand (1995), every new (or refurbished) building, including libraries, is a 'prediction about the future' as, although new spaces have to be fit for purpose on their first day of opening, they must also, more importantly in my view, be fit for an unknown future. Being fit for the future is the biggest challenge facing any new development especially, as Brand also writes 'predictions [about the future] are always wrong!'. So – there are no right answers. The aim of the rest of this paper is to think about and better understand what is happening with learning, technology, and experiences that can inform the development library and learning space in these early years of the 21st century.

Thinking about learning

Libraries have always been places of learning, supporting personal exploration of the information and knowledge held in their collections and also being a place for researchers to learn and for the learner as researcher. Equally instruction on how to make best use of the resources held by the library and how to access its services has always been part of the work of the library either through documentation distributed to users or specific training courses. This role has further developed with the growth of e-resources with libraries acting as information brokers. In these ways libraries are already part of the national, and international, learning infrastructure but there remains much more scope for them play a greater role in community, societal and individual learning by developing support for learners and their learning in the physical and virtual library. Understanding learning support that goes beyond instruction is an important first step in assuming this greater role.

In the late 20th and early 21st Century theories and models of information literacy have been developed in the library context - for example in the UK both SCONUL, an organisation that supports libraries in the HE sector and the National UK Libraries, and CILIP, providing support to all member librarians, have developed structured models for the provision of information literacy training and education. Some of these models were informed by current learning theories, for example, the SCONUL seven pillars model (2011) (with the recent addition of a cyclical representation of the pillars) is strikingly similar to Kolb's model of learning (1984) acknowledging that for learning to occur the learning experience requires a phase of reflection, to then learn from the experience, and then plan and conceive the next experience. However, in practice most uses of models such as the seven pillars do not consider all of Kolb's stages but tend to focus on information finding. Making the shift from an operational 'consumer view' of the library as access to learning resources towards the library playing an active role in the process of learning is one of the challenges for models of information literacy and for the library's real involvement in learning. With this shift comes a second most important change of perspective – consumers in the modern library become producers as Lorcan Dempsey (2010) suggests the outside-in library of the past, that collects resources in a place for users to use, becomes the inside-out library that enables users to become producers and the library makes their products available beyond the confines of the building.

In the 21st century technology has become a key part of the skills environment required to access and handle information and develop new knowledge. Inability to use technology effectively is an insurmountable barrier to information access and use. Upto 30 years ago many libraries led the way in IT training refocusing their efforts on IT literacy as a necessary precursor to information skills. Unfortunately much of this work, as in school systems, took something of a cul-de-sac by focusing on instruction in the use of commercial software rather than the generic transferable understanding of IT as a tool for personal creativity and production. Emerging new technologies are fortunately enabling users to move beyond this episode by providing intuitive interfaces and applications. As we move to the next stage of digital and media literacy and a 'participatory culture' (Jenkins 2013) we need to rethink our library and learning space provision, the contribution that the library can make to communal and individual learning, and to revise our view of learners as consumers of information to one of constructors and producers of knowledge.

We live in a conceptual age

Ken Robinson (2013) claims that :

Current systems of education were not designed to meet the challenges we now face. They were developed to meet the needs of a former age. Reform is not enough: they need to be transformed

Continuing to educate using only an 'industrial' approach is highly questionable at the current stage of societal development described by Daniel Pink (2005) in his book 'A Whole New Mind'. Pink identifies a societal transition over the past 200 years from an agricultural to an industrial and, eventually, to an age of information/knowledge. Much of what we currently read, what determines how we configure our libraries, and what we 'teach' in our libraries relates to this information society and methodologies we use to teach it are informed by the instructional approaches of the industrial age. In these early years of the twenty-first century Pink sees a new significant societal shift with the emergence of a conceptual society—a society that values personal attributes such as creativity and empathy as the most important individual and collective societal assets. This conceptual society is about creative capacity and the ability to generate new thinking and ideas that forms a new basis for global individual participation and national competitiveness – an ideas economy. Education is the only resource that we have to be competitive in any economy, not least an ideas economy, and rethinking how we can shift our education systems from their focus on instruction to enable learners to develop broader skills is the challenge. Thinking about new library and learning space requires an awareness of the changing nature of the activities of both teachers and learners in order to ensure that services and resources are used to the best effect. Freeman (2005) sees libraries "as an extension of the classroom" concluding that "library space needs to embody new pedagogies, including collaborative and interactive modalities".

There has been increasing emphasis on how learners develop through informal learning that occurs outside the classroom in recent years, for example the impact of the Massively Open Online Courses (MOOCs) that are rapidly developing in higher education worldwide. When lectures are 'delivered' on mass online it is what happens outside of these events that is the 'real' learning. Libraries of all types, and their spaces, consequently have a more important role than ever before as places of learning in what is becoming a truly mass education system. In such a 'flipped' system, libraries, in both the education and public sectors, need a vision and purpose about people and how they learn and to make a real contribution to the learning that is appropriate to the conceptual society. 21st century libraries are at the confluence of the information and ideas economies valuing and supporting the learner as producer and recognising the reality of Jenkins (2013) participatory culture.

What's happening with learning?

John Seely Brown (Brown and Duguid 2000) believes that: 'learning is a remarkably social process. In truth, it occurs not as a response to teaching, but rather as a result of a social framework that fosters learning'. This theme of the orality and sociality of learning, which

sees knowledge as both a social construct and a result of social interaction, is rooted in a Vygotskian social constructivist view of the world (Pass, 2004). Our common understanding of 'social' is devoid of a learning perspective and focuses on the importance of interactions with others in informal get-togethers. However, the main activity in such gatherings is conversation and as Seely Brown (2000) notes:

“All learning starts with conversation”

This simple statement is easy to dismiss but in fact describes a far-reaching and deeply important idea extending our view of what 'social' is from the sociality of interaction to the sociality of learning. Conversation, an important component much human interaction, plays a key role in the whole range of learning (and teaching) activities and involves not just conversations with peers and teachers but also with materials, resources and technologies (for a more detailed conversational framework and discussion see Laurillard (2002)). Conversation contributes to a wide spectrum of learning activities that include: acquisition of and inquiry about knowledge and information, discussion, practice, and collaboration and production. Conversation is also a key component of a wide range of current learning theories including social constructivism (peers checking their understanding through conversation), instructionism (teachers' presentation and explanations), constructionism (conversations with ourselves that modify our conceptual frameworks), and situated learning (co-creating knowledge in the situation you intend to use it in).

Laurillard's model presents a broad unrestricted view of conversations: including the one way 'conversation' of the lecture or presentation as well as the multi-channel conversations of team and peer group work but also, importantly, the private conversations with ourselves inside our heads that serve to structure and consolidate learning experiences:

When I was a kid growing up in Far Rockaway, I had a friend named Bernie Walker. We both had "labs" at home, and we would do various "experiments". One time, we were discussing something - we must have been 11 or 12 at the time - and I said, "But thinking is nothing but talking to yourself inside." (Feynman 2000)

The importance of conversation to effective learning is clear in both social and personal contexts as is the point that the current focus on social learning is not a replacement for all that has gone before but more correctly an attempt to address the universality of one way conversations that characterize instruction. The opportunity for libraries, as learning places, is to contribute to this rebalancing. The challenge is, through the facilities we create and the services we offer in our libraries and learning spaces, to rebalance education systems that have for too long focused too heavily on instruction. In considering the nature of learning to inform our libraries of the future, we should avoid overt enthusiasm for social learning recognizing that learning is socio-personal and diverse. New library and learning space should reflect the diversity of conversational possibility redressing the balance between social construction of understanding and the instructional acquisition of information. Libraries should provide environments and experiences for learners that enable them to challenge and develop their frameworks of understanding through as rich a variety of conversations as possible. Carefully constructed social learning space with a variety that supports all types of conversation from active engagement with others to solitary reflection enables learning – the creation of social space alone will not. Given appropriate space how people supporting learning in the library participate in the conversations and create the experience is crucial to the effectiveness of the space. Librarians can play a significant role in learning because they understand resources - the primary material of the learning process. The range of open education resources is expanding rapidly (Bonk 2009) and now provides a basis for librarians to build further on their key skills enabling them to find their place as learning facilitators in the learning library.

It's not just diversity of conversation but also intelligence

Howard Gardner's research (2006, 1999, 1993) in educational psychology makes it clear that

intelligence is not a singular concept but that learners all have a wide range of facets to their personal intelligence – and consequently are all intelligently different. The clear message from this work is again the existence of individual difference and the inherent variety of need exhibited by learners. There is also now an acknowledgement that learning has an important emotional component. Positive and negative emotions can improve or hinder learning. Jensen (2005) reminds us that not only are emotions important as drivers and barriers to learning but that they are present all the time, connected to our behaviours and transient - continuously dynamically changing. It is also clear that the dynamic nature of need is complex involving as it does emotions. Personality and intelligence factors. The result is a complexity of *the personal context in which people learn* that demands we strive continually to understand in experiential terms what environments might *work and what will not*. Spaces that we create can improve or hinder learning through the subtle effects that they have on those who inhabit them. Italian teacher and psychologist Loris Malaguzzi believed that children develop through interactions, first with the adults in their lives – parents and teachers – then with their peers, and ultimately with the environment around them. Malaguzzi believed that the environment is the third teacher.

Some implications for library space

The environment in which we work and learn can indeed influence how we feel and how we learn. Rizzo(2002) provides some useful guidance derived from exploring the expectations of academic library users for types of environments that they seek. Rizzo lists 4 types of space:

- (1) Highly active and engaging communal places
- (2) Interactive collaborative places for individual research and group work
- (3) Quieter less active places such as reading/ study rooms and alcoves
- (4) Out of the way contemplative places for quiet reflection and deep thought

These general types of space give us a useful framework for thinking about what a 21st century library can provide. These types are neither definitive nor exclusive but are a starting point and open to extrapolation, extension and fusion. The extent of any marketplace type space (Rizzo's type1) and monastic space (Rizzo's type 4) and the balance between them will vary from library to library. Thinking about the balance of these types of space means considering the extent of 'noisy' social or social learning space of types 1 and 2, currently in vogue in many UK libraries, versus the quiet and silent spaces of types 3 and 4 of the more traditional library. The reality of changing user expectations and 21st century ideas about learning encourages a shift from types 3 and 4 to types 1 and 2. This is expressed clearly by Lankes (2013) in the idea that "Today's great libraries are transforming from quiet buildings with a loud room or two to loud buildings with a quiet room. They are shifting from the domain of the librarians to the domain of the communities". A **successful** 21st century library will need to have a balance between types of space that meets the needs of the communities that use it. However, a **really successful** 21st century library, will have a dynamic balance that exceeds expectations and can morph over the annual cycle of use to closely match demand over time. A clear example is the increased demand in educational organisations for more quiet study space in their libraries around exam time as compared with the need for more group study space during project working. Making such changes can be as simple as flicking a switch that changes the colour of the space by changing the lighting or deploying semi-private structures or partitions to provide privacy or space for group activity that does not interfere with the activities of others nearby. The least successful spaces are those that don't match user need and are unable to adapt to changing short-term demands. A variety of spaces that are balanced and dynamic will ensure that provision matches need over time.

Variety and Flexibility

So from a learning perspective a variety of spaces that acknowledge individual difference, conversational learning and emotional factors, rather than ignores them, demands a new approach to what we provide in our libraries and how we provide it. One clear message emerges – there is a wide range individual difference amongst our library users that stems from an inherent variety of need and that these needs change over time. This suggests a real

requirement for variety of space provision in our libraries to give learners real choice. But this variety is not about separate space silos. It is about recognising that we are social animals with distinctive contributions and that we construct our frameworks of understanding within a powerful conversational framework that includes a continuum of interactions with resources and technology, listening, participating, contributing, reflecting and producing. Learning will always be the responsibility of the individual; libraries currently, through their resource collections, supply the resource inputs; they need to do more to embrace, encourage, stimulate and promote the producers of future knowledge. Shifting the focus of library space to the activities of people as learners and producers in the context of the rapidly emerging conceptual age requires us not just to understand how people learn but also how the spaces that we provide can support them.

Technology and the Library

Over the years libraries have used technology to improve operational efficiency by adopting IT systems that automate their operations and services focusing on the acquisition, management and circulation of resources and more recently extended, somewhat imperfectly, to the management of digital resources. By contrast the use of technology in relation to library space has been somewhat neglected. Extensive hardware provision, networking and self-service facilities have been the most noticeable aspects of 'technology rich' space along with some investment in electronic signage and display screens. The idea of the commons, such as IT commons and Information Commons (Watson and Anderson 2008), has involved the creation of ever larger installations of serried ranks of networked desktop machines, in most universities and many public libraries, reminiscent of battery chicken style 'farms'. Such unpleasant environments are a long way from the learning enhancing environments envisaged in previous sections of this paper. In most cases where technology is added to existing or even new library space it is clearly a bolt on solution that does not serve to enhance the space.

The rate of technology change is accelerating. Seeing what technology will do next is therefore not easy and spotting which technology innovations are likely to become ubiquitous, and of real importance to library space development, is a much bigger challenge than it has been in the past. How will IT developments that now seem irrelevant to libraries such as driverless cars, google glass, 3D printers, cloud computing, the social web, wearable devices, robots, machine intelligence or the products of nanotechnology affect the library? And which of these, if any, might ensure a brighter future for libraries over the coming years? This incomplete short list is just the technologies that we have now – the reality is that the continuing development of technology at a rate of change² (the rate of change squared) will have more fundamental effects than we can currently imagine. Ray Kurzweil (2006) predicts that by the end of the 2020s computers will pass the Turing test—that is a machine will be able to participate in a conversation so competently that it will be indistinguishable from a human being. Will we continue to need staff in libraries to provide guidance and deal with queries? When this and other unimagined developments happen it surely takes us beyond adoption or even adaption to a need for libraries to embrace and assimilate technology. Computers are certain to be self-repairing, self-replicating, and responsible for their own further development not too far into the future making change² even more challenging. The consequence of this increasing pace in the rate of change and our failure to see it is that the impact of technology on all aspects of life including libraries and the work of librarians will be enormous, deeply important and largely unexpected. Change² brings uncertainty and suggests that we need to fundamentally rethink the form and function of the library as a place. Why will people choose to go the library? To answer this question in the context of technology libraries need to closely evaluate the library-technology relationship.

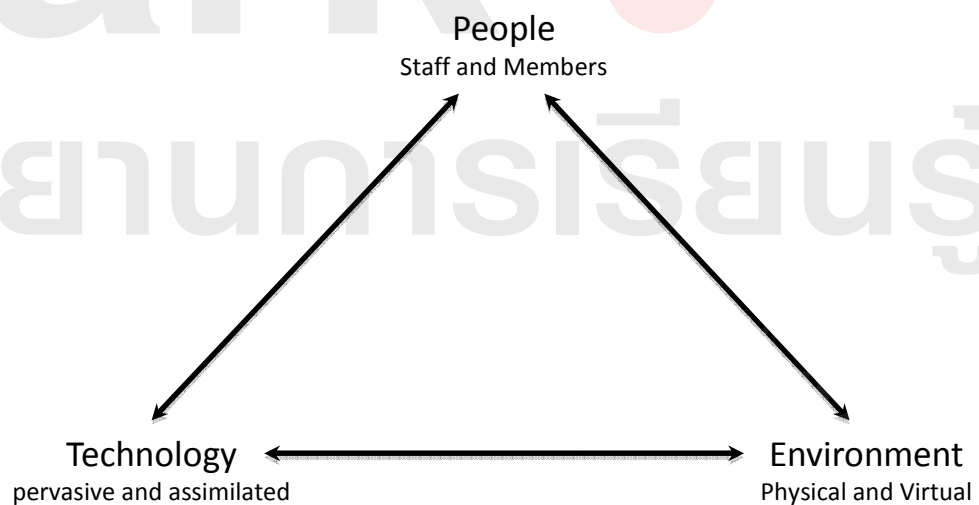
The Library is Technology

"Technology is anything that was invented after you were born"

Alan Kay

Libraries have responded to the technology of information and communications with responses that are often simply bolted on to existing facilities and services. Mostly adoption with little adaptation. When the technology has a specific role such as microfiche or printing technology this works well. It is when a generic technology all-purpose technology, such as the personal computer, has been adopted that the implementation has been disappointing. Kevin Kelly (2010), co-founder of Wired, likens individual technologies to species in a rapidly evolving technological ecosystem that he calls the technium. Kelly's technium is a technology system that "extends beyond shiny hardware to include culture, art, social institutions, and intellectual creations of all types" and consists not just of all the tools that have been invented by the human race but also all the systems that enable us to manage, develop and use these tools. Kelly believes that over the centuries the technium has evolved in parallel with biological systems. From this perspective the library itself is a technology, a system within the technium that has emerged to enable continued use of technologies such as tablets (of stone), through hand written manuscripts, to the printed word, digital artifacts and multimedia materials. The deeper question for the library then is what is the next form of the technology that is the library? Such a question goes way beyond considering the tactics of technology adoption and adaption by libraries. What is needed is for the library to internalise and assimilate technology using imagination to take the technology that we currently call a library to its next technological stage rather than continue the current position in which libraries bolt on technologies as they emerge.

One of the directional characteristics of Kelly's evolving technium is that as it evolves it creates greater opportunity – specifically opportunities for human betterment through the extension of our intellectual and creative capability. The consequence of greater opportunity is more choice and Kelly believes that "we [as humans] need the full spectrum of choices won by the technium to unleash our own maximum potential". In Kelly's view we should "always act to increase choice". The idea of library as a technology system and of developing the library as a system that works to increase choice provides a powerful perspective that takes us beyond bolt on technology implementations and puts the focus firmly on the members (users and staff) of the library. A bolt on approach to technology is a tactical one and can never take the library to its next technological level. Bolt on approaches tend to adopt technologies only when safe to do so. For technology to be internalised and assimilated by any organisation it has to be future focused and integral to the strategic framework of the organisation. Technology has to enhance the work of the people of the organisation and be integrated into its environment as suggested in the diagram below:



Whilst this strategic approach will not predict the future it does provide a framework for thinking about technology and how it interacts with other factors within the technology

system that is the library. An important aspect of this framework is that it highlights the assimilation and integration of technology with other key resources. Considering these factors together is more likely to ensure that they work in synergy and add value to each other rather than work against one another. Thinking, strategising and planning around any one of these three factors must embrace its interaction and impact with the others and in doing so is more likely to produce additive effects and benefits as compared with considering them separately. A simple example might be that in the past it has been common for libraries implementing self-service solutions to site the machines on or near the desk with the effects of cluttering the space on or around the desk and creating uncertainty for staff and library members about when, or whether, to use the new facilities. Negatively affecting the environment and potentially confusing people. Thinking about the real purpose of the technology, how we want the space to work and what our expectations are of staff and members holistically would suggest that placing machines away from the desk, as a first intervention when users enter the building with other machines distributed throughout the building would be a solution that not only enhances the environment but also makes the choice to use the technology more obvious to members and staff of the library. The key objective of an integrated technology strategy is the creation of a technology rich library space, both physical and virtual, that provides users with service options and choices underpinned by technologies that are unobtrusive and seamlessly integrated into the library experience.

So what does technology rich library space look like today?

Ubiquity

Current technology rich library space has ubiquitous networking both wired and wireless enabling library members to use technology devices throughout the space. Some of these connected devices are 'owned' by the library and include desktop computers arranged in a variety of ways for individual and group use but more importantly many of the devices are owned by the library user. The current BYOD (Bring Your Own Device) trend prevalent in higher education and public libraries lending e-books frees up users to bring their own laptops, tablets and smartphones to work in the library. This is a welcome change from requiring library users to use library 'owned' desktop machines partly because it acknowledges the personal nature of technology (as in PC = **personal** computer) and also because it enables users to work with their preferred applications software and have real time access to their personal cloud storage.

"What a person can achieve with an outdated machine in a public library with mandatory filtering software and no opportunity for storage or transmission pales in comparison to what a person can accomplish with a home computer with unfettered Internet access, high bandwidth, and continuous connectivity."

Jenkins (2013)

Importantly the use of these devices also enables users to choose where they work within the library selecting the environment that best suits their current needs. Mobility, however, is still restricted by the occasional need for access to power. A well-equipped technology rich library has an extensive under floor power grid and power sockets mounted on tables and informal furniture such as sofas. The technology rich library also reinforces the theme of ubiquitous distributed technology by the loan of mobile devices for use throughout the building. Alongside BYOD technology rich libraries will continue to provide some devices for those in their community that would not otherwise have access to it. Into the future providing greater technology choice involves exploiting wireless power as it becomes available in the next few years and new types of mobile wearable devices as they become the norm. Librarians have always been early adopters of technology (for example, using punched-cards and microfilm for activities such as issue systems, indexing and newspaper preservation in the early 1960s) and the library role of horizon scanning and showcasing new technological possibilities continues in the technology rich library –so expect early use of 3D smartboards and 3D printers in the technology rich library for example.

Technology management

Like most technology systems the technology rich library currently has both emerging and legacy technologies including books. The technology rich library will have taken a carefully considered approach to the balance between space for books and space for users adopting strategies such as annual stock reviews and deletion of items no longer required. Detailed knowledge of stock use (provided by borrowing stats for example) is essential to inform this strategy and also to extend the strategy into an active management policy that takes a strategic approach to the use of open access shelving, compact shelving and remote book stores to free up space for users. Imaginative solutions for holding books in the library should also be part of the technology strategy for example using books to create zones within the library, book walls to provide privacy and sound proofing and books to create inspirational features within the library. The adoption and use of electronic resources and digitisation enable the technology rich library to extend the space for people whilst at the same time increasing the scope of the collection. Careful and imaginative management of legacy resources is an essential first step in a library refurbishment or new build to ensure that maximum space can be provided for users.

Interaction with the building and its resources

Technology can also be embedded and used to have an ongoing conversation with members of the library as they move from space to space within the building. At a basic level electronic signage can be used to provide dynamic information for users on the library, its events and services. As in museums some libraries use QR codes that can be accessed from smart phones to explore deeper information or local information points can send information to mobile devices using Bluetooth connections as users walk past them. Interactive displays based on surface technology can be used to take electronic signage to the next stage providing novel ways of experiencing information such as those that can be used to explore local history resources by manipulating them on an interactive table top. Many libraries make extensive use of lighting technology to enhance the look and feel of library spaces – using light to modify the colour of a space throughout the day can have powerful emotional effects on mood and behaviour and is a real alternative to fixed colour décor. Similarly graphics can be used to create a range of environments within the library to encourage active group work or quieter behaviour. Audio devices can provide variety to the way that information is presented for example by using sounds at entrance point so the space to add to the user experience such as a Ssssh as users enter a quiet zone or the sounds of the marketplace as they enter the interactive group space.

Knowing users and their needs

All libraries strive to obtain data on how members use the library and how the facilities and services can be improved – technology has much to offer to assist with this. Simple data is easy to collect (such as the footfall mentioned earlier in this chapter) and to understand but the real ‘user experience’ of the library is complex and difficult to understand. The dilemma is that if we stick with simplicity we can both collect and analyse the data if we seek a more in-depth understanding of our users and dig deeper both collection and analysis become complex and burdensome. Enter Big Data – recent developments in the ability not only to collect large volumes of data but also to use the technology itself, using complex algorithms and greater computing power, to analyse and understand this data is becoming possible. For the technology rich library this presents the opportunity to get a much better understanding of the ‘library experience’. In the late 20th century Mihaly Csikszentmihaly developed the technique of experience sampling. Using pagers Csikszentmihaly’s researchers were able to collect data in real time on how happy people were leading to the development of his now widely known flow theory of happiness. How much more powerful could this technique be using today’s mobile devices combined with Big Data to get a genuine understanding of the library experience. The experience sampling method has the potential to provide real insights as it overcomes the tyranny of our current time lapse feedback methods. Collecting real time data, that rather than focusing on what happened in the past tells us what is happening in the present, and analysing and synthesising the results using big data techniques could enable us to also understand how users feel about our facilities and services.

The robots are coming

Mention robots to most people and the idea may well be met with disgust or disbelief - but the robots are coming and will have uses in the technology rich library. Robots are already playing a role in book repository retrieval using RFID and robotic arms are used to offload book hoppers onto conveyers. At present librarians are also still picking individual books guided by RFID scanners and may do so for some time – at least until the stand alone mobile robot that can search the shelves arrives. The form that future robots will take and when they will become socially acceptable is at present unknowable. However, the technology rich librarian should be thinking about what she or he would wish them to do. Providing the best environment for library users depends on making the best use of all resources – both human and robotic. Arthur C. Clarke is reported to have said “A teacher that can be replaced by a machine should be”. Any librarian that can be replaced by a robot should also be – librarians have more meaningful work to do.

It's the experience of physical space that is important

Creativity is at the heart of the conceptual society mentioned earlier in this paper. In his work on 'the creative class' Florida (2003) reveals, importantly, that contrary to our expectations about connected net-aware creative people they still do value place:

“The death-of-place prognostications simply do not square with the countless people I have interviewed, the focus groups I've observed, and the statistical research I've done. Place and community are more critical factors than ever before... the economy itself increasingly takes form around real concentrations of people in real places”

indicating the need for the continuation of the library as a physical place. According to Florida, from his work with focus groups of creative class people, what is important are experiences:

“Experiences are replacing goods and services because they stimulate our creative faculties and enhance our creative capacities. This active, experiential lifestyle is spreading and becoming more prevalent in society...”

Writing about the 'Experience Economy' Pine and Gilmore (1999) describe a progression of customer needs from commodities to goods then services and ultimately experiences. Providing excellent library experiences should be one of the primary aims of any library and learning space development. How users experience the library is dependent on the quality of the space, how it is organised and the services provided within the space – space and service are inseparable and interdependent. Where space and services are designed and managed to fit perfectly with expectations, and change over time as expectations change, excellent experiences will be the outcome. Consequently the library as a place should become a focus for association and activity and home to a wide range of facilities and services preserving the best of the information, support, services, community and resources that have traditionally been provided – the experience should be, and feel like, more than just a library:

“People forget what you said, they forget what you did, but they never forget how you made them feel”

Maya Angelou in Prahalad and Sawhney (2011)

Making library buildings 'an experience' is a fresh perspective that demands we think about their look and feel in considerable detail. Richard Florida's work illustrates that place remains important to members of the conceptual age and the importance of thinking of our buildings as experiences cannot be underestimated. The designer Karim Rashid expresses this well in point number 43 of a 50 point manifesto: 'Experience is the most important part of living, and the exchange of ideas and human contact is all there really is. Space and objects can encourage increased experiences or detract from our experiences' (www.karimrashid.com). Such thinking takes us beyond customer service to a requirement for intimate knowledge of those that use our facilities that translates into an understanding of how they experience, and

how they feel about how they experience, our libraries and learning spaces which clearly highlights the importance of the discussion on big data in the technology section above.

A word on the Third Place

Much has been written about Oldenburg's (1999) idea of the Third Place:

Third places are neither home nor work - the 'first two' places - but venues like coffee shops, bookstores and cafes in which we find less formal acquaintances. These comprise 'the heart of a community's social vitality' where people go for good company and lively conversation

Many of the ideas discussed briefly in the previous section can be applied to the third place concept. However, the danger of the Third Place model for the library is that it talks only of sociality, company and good conversation but not of purposeful work and learning through conversation. As a stimulus to development this concept is a step on the path and has been a useful touchstone. Future libraries, however, need a model that combines the third place with the productivity of the second and first places of work and home. Indeed an important aspect of library space is often to create a 'study home' for those users who do otherwise have such a place.

Some realities

Hugh Anderson and I (2008) carried out a survey of a number of UK further and higher education institutions to identify which of these tangible factors proved to most problematic. By a clear margin heating and ventilation caused the most issues for the spaces in our survey, closely followed by noise. Many libraries and learning spaces are felt by users to be too hot in the summer and too cold in the winter and users of the space often complain about the lack of local control that they have over heating and ventilation. Ensuring that temperature and ventilation controls are rigorously modelled is an absolutely essential pre-requisite to project success that must be undertaken in the planning stage of the project. Issues around noise were often mentioned to us in our survey, particularly in respect of large open plan spaces, but in spaces where strategies such as zoning and semi-private structures (see later in this paper) were deployed noise was not an issue.

Amongst the factors that were felt to be less problematic were lighting and smells. Whilst it appeared from the survey that there was a general satisfaction with lighting arrangements our feeling was that this was often a missed opportunity to introduce additional impact into a space by using lighting that could add interest and provide an easily manageable way of providing colour flexibility – a key factor in determining mood that can also send subtle signals about the purpose of a space that was mentioned earlier in this paper. The advice here is also that sufficient consideration be given to lighting not just as the necessity of conforming to standards but as an additional way of enhancing the emotional impact of the space.

With the increasing prevalence of food and drink in library and learning spaces care should be taken where possible to ensure that smells are not intrusive and the advice is the planning of ventilation systems should take food and drink into account as it is now becoming the norm to have refreshment facilities in libraries and learning spaces.

However, in spite of all the things we know we know, it is the things that we don't know that can force a project off course but, paradoxically, it is also these unknowns that can make a project great. Alongside the certainty of getting tangibles such as heating and ventilation right there will certainly also be uncertainty, for example about the effects the lighting system might have. However, it is impossible to remove all uncertainty in a project so we must have flexibility in what we build to provide the facility for modification and change if needed.

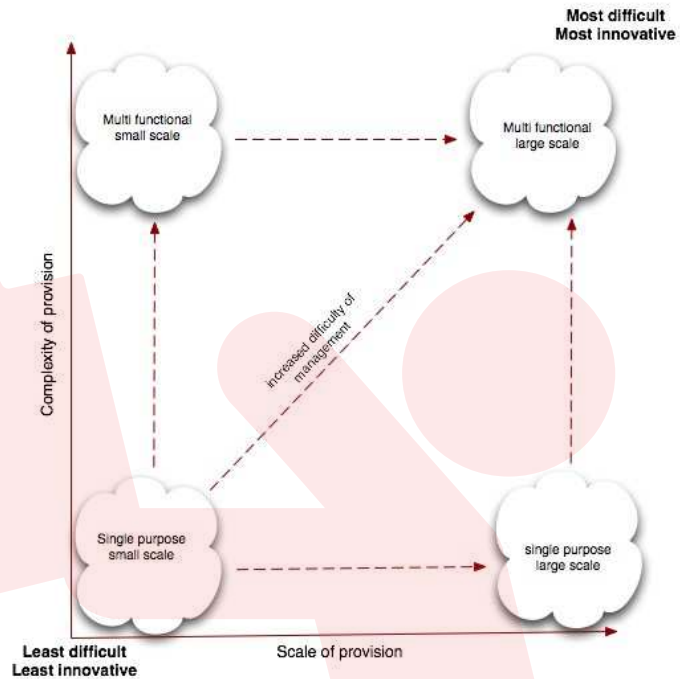
Trends and ideas - space

Open Plan Space

For new build projects the most common modern approach has been to provide open plan space. Open plan deals with some of the uncertainty mentioned above and brings the promise of ongoing reconfiguration as the building learns, through use and emerging trends, what is required of it as a space. Flexibility for the future is the key desirable feature of these spaces exemplified by the ground floor services mall in the Saltire Centre at Glasgow Caledonian University (see www.leswatson.net). Most importantly, in the most successful implementations of open plan, there has been careful consideration of how the areas connect avoiding unnecessary traffic through the buildings with poorly located 'feature' stairs, or ill-conceived mezzanines or lightwells overwhelming open spaces simply for architectural effect. It is harder to be wrong about the future with open space that offers endless possibility. But open plan is not without its critics who focus on the potential for noise and lack of privacy. However, careful selection and positioning of furniture and location of book stacks contains noise and provides some semi-private space (see below). Importantly open plan also provides the opportunity to regularly 'redesign' the space by introducing new structures and items of furniture or rearranging existing furniture (relatively straightforward) and book stacks (more difficult and resource intensive) to create quiet and noisy zones for example. Open plan is an important feature that brings the prize of flexibility but this has to be balanced by a zoning strategy (that is naturally provided by walls in some older buildings).

Open plan versus enclosed space

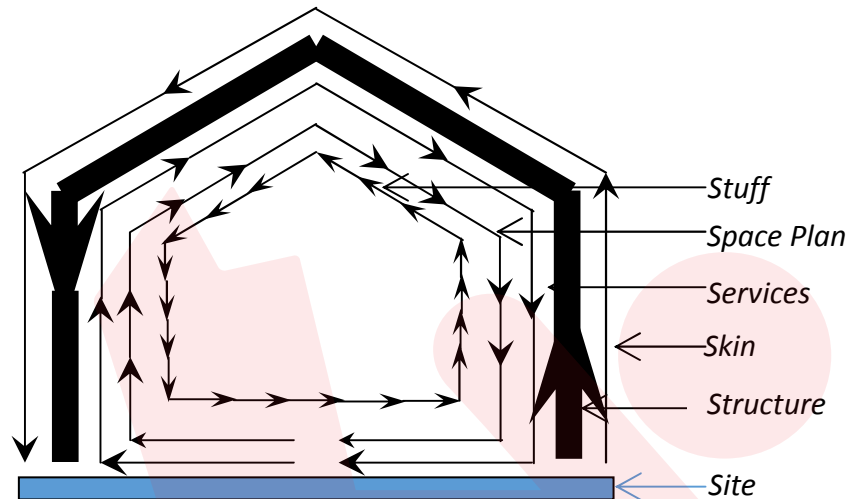
In open plan technology rich space the detail of the space is defined by furniture, fittings and equipment, and can easily be changed making experimentation with the space relatively straightforward. Open plan originated in offices around the middle of the last century and came about partly to squeeze as much accommodation as possible from the space available, but also to address the need for flexibility arising from changed working practice and the introduction of IT. The design of libraries and learning spaces now has similar pressure to squeeze more use out of the space available. Over-simplicity in meeting the combined needs for flexibility and high levels of occupancy, for example by providing office accommodation in massive open space crammed with screened off cells, can lead to universal dislike of such spaces with the accompanying difficulty of user unhappiness. Potentially modern open plan library space can lead to similar problems if it lacks variety and interior design, but if planned carefully open plan space is not just flexible but also allows for variety, flow and complexity. Open plan space done well provides inspiration, stimulation, curiosity, interest, opportunities for vicarious learning, a sense of community and choice and excitement for those that use it. With flexibility, however, comes potential complexity. In the diagram below (Watson and Anderson 2008) the scale and complexity of a space are compared:



The diagram illustrates the idea that large open plan spaces carry with them, in addition to promise of greater potential for change and ongoing innovation, the inevitable overhead of difficulty of management. Any project must consider this tension between difficulty of ongoing management and potential for innovation at the planning stage. Open plan technology rich space is not a panacea and an important initial consideration in the development of library and learning space has to be the realities and practicalities of ongoing management of the space – there is no point building for the flexibility that open plan technology rich space can bring if the resources needed to manage the space cannot be made available into the future. The issues expressed above in respect of open plan office space also warn against extreme use, particularly overpopulation, of open plan learning space. In selecting open plan versus cellular space a key question to consider is which activities do we wish to continue into the future that will require specialist use or need to be enclosed for other reasons. Honesty is needed when addressing the question of whether fixed full height walls are really necessary for an activity is crucial– realising that in most situations it is always easier to argue for the status quo than for change – change is the experiment. Flexibility is a desirable characteristic of space allowing innovation and experiment making it ‘fit for the future’ but it does have a cost of ongoing complexity of management.

Flexibility

Doing all the future thinking for a 2 or 3 year project, a new build for example, means that the completed project is potentially 2 or 3 years out of date on completion. However, project management and implementation can, to some extent, run in parallel with the consultative processes, workshops, conversations, discussions and daydreaming required to develop a great project recognising that any significant changes in the project at a late stage are expensive and must be avoided if at all possible. The components shown in the diagram below have varying rates of change, for example the site on which the building is constructed is eternal and shows little change over time as opposed to the Stuff in the building (most items of furniture and fittings) that have a useful lifespan of say 7 to 10 years. This is not a hierarchy but each layer has its own speed of change and consequently its own replacement cycle. In a rapidly moving world it makes sense to locate the capacity for change in those items with the potential shortest life span. This idea translates into the concept of Pace Layering shown in the diagram below:



Shearing layers of change. Because of the different rates of change of its components, a building is always tearing itself apart

From Stewart Brand - How Buildings Learn p.13

For buildings and new spaces this means avoiding creating some layers, such as fixed internal dividing walls, that have a medium term life span and are a potential barrier to accommodating changing activities. As stated previously once created cellular space is difficult to remove requiring building works. This idea of pace layering is touched on in the section on open plan space (above) in observing the importance of the ability of structures to start to act as furniture and furniture to start to structure a space that provides the greatest opportunity in the design of open plan spaces. The suggestion is that investing in furniture, fittings and equipment as the way of creating the internal environment and zoning (see below) the space provides greater opportunity for future flexibility. The idea of pace layering also serves as a guide to when each aspect of the project needs to be finally decided and become unchangeable – the least permanent, and potentially most important in terms of creating the environment, can be finally decided upon relatively late in the project.

Zoning

The overall tendency in libraries, even most existing ones, is for space to lean towards open plan rather than cellular. Currently such open plan spaces provide a home for the book stacks that bring with them their own potential zoning strategy regularly segmenting the space from floor to near ceiling height. Collection consolidation may give the opportunity to use the remaining stacks as 'book walls' to create effective zones, or small 'rooms' within an open space. In new space carefully selected furniture can be used to the same effect and has the advantage of being more easily reconfigured for future needs. Ideally, even in open plan space, zones can, and if possible should, arise out of the natural configuration of the building with the zoning strategy enhanced further by the strategic positioning of furniture or other fit-out items. The purpose of creating zones is for them to have a different environmental feel and purpose appealing to a variety of emotions and supporting the idea of variety discussed in the sections on learning above.

The degree of separation can vary depending on the height of furniture and fit out items used. Zoning does however have its limitations so that in the planning of a new library and its

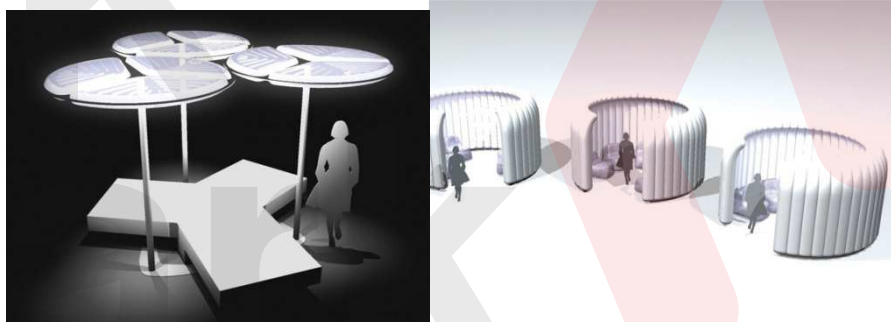
associated learning space it is important to ensure that the architecture of the building provides these separation needed between the extremes of environment desired – noisy and silent do not co-locate well. What is important is that zoning is another route to enabling choice, providing the kind of flexibility that enables people and activities to move about the building without the need for constant physical adaptation of the space. A well-zoned space will provide choice for users that is easily understood, supports interaction and also works against ownership of different parts of the building by different interest groups.

Semi-private space

Included in the category of ‘other fit out items’ - items that stand within an open plan space but provide a degree of privacy – what I call semi-private spaces. These can be used for two reasons. Firstly to shield the users of the library from the less tidy parts of library operations such as self-service machines, printers and book trolleys by enclosing them in pods or other similar structures. Secondly to partly separate members of the library from others in the large open space allowing an individual or group to work within open plan space yet feel that they are working in a private room.

In the first category structures can be constructed such as printer pods, trolley bays and self-service machine housings that not only serve to ‘hide’ these items but also enhance the environment. For example pods to house printing and photocopy services contain the noise and untidiness of the machines but also create opportunities for interest, through the use of graphics inside the pod, on an otherwise open floor.

The second point is the separation for members of the library who want to work individually or in a small group. Most new developments include some form of banquette, or diner style seating for example and book walls have been mentioned above. There is a range of semi-private structures that provide varying degrees of enclosure and sound separation such as mobile canopies, inflatable igloos, and umbrellas as illustrated below.



Concept for ‘street umbrellas’ and inflatable ‘igloos for the Saltire Centre at Glasgow Caledonian University

These ‘temporary semi-private’ structures are recognisably different from other furniture and fittings in the space and, as their continuous use and popularity suggest, appeal to users in other ways than just their ability to reduce noise. They serve to structure the space from a space planning point of view whilst interfering minimally with its flexibility. This recognition of the importance of the ability of structures to start to act as furniture and furniture to start to structure a space provides the greatest opportunity in the design for flexibility of open plan spaces.

Flow

The creation of space is not, however, merely about the range and balance of a variety of spaces (although these are important) but is also about how they interrelate and flow from one space to another. Crucial is how a fragmented feel is avoided and how, in the case of a part refurbishment, the ‘bolt on’ facility is integrated into the whole. Much has been written about the library as Third Place as mentioned earlier, those places that are not work and not home but that hold special significance to those who visit and use them. According to Mikunda (2006) the creation of a third place should have a ‘golden thread’ (flow) running

through it that encourages users to 'mall' and to explore it. Using the tricks of suspense and revelation such places also often have a landmark or core attraction that arouses curiosity – the 'wow' that is so often found in new spaces and buildings. Examples include public works of art, impressive atrium spaces and the furniture itself deployed in the space. Flow facilitates user journeys through the space. Landmarks and core attractions provide destinations.

Space and service are inseparable

Space and service are symbiotically linked and service change and improvement is always possible in any library but a rebuild or refurbishment enables more extensive experimentation with the range of services provided and how these are provided. It is common in many UK libraries to see improvement in the delivery of services through the use of self-issue and return facilities. Improvement is often focused on greater degrees of self-help where possible, removing barriers to service access and integration of services. By providing a larger number of service points than usually needed service desks can be designed to 'expand and contract' by moving staff from other duties to the desk when busy in order to respond to demand for services. For example by having a central desk (a seated desk, for staff and users) and two satellite desks so that if queues develop additional staff have somewhere to work and when these satellites are not being used then library users can make use of them. The barrier effect of the desk can be reduced by making it low level and building seating into it. However, in spite of these efforts to make the desk more of a shared facility between the user and staff, the desk can still be a formidable barrier between the two. The aspiration to reduce the impact of service desks and bring a sense of partnership to service delivery has been taken further with libraries using small informal pods at key points in the building. These small pods are also moveable providing the possibility for 'pop-up' delivery points. With such flexibility service strategies can be adopted that encourage staff to switch from roaming duties to desk duties as required providing an enhanced service for users that responds to needs in a timely way.

Service Integration

Another strategy for a future in which resources are constrained is integration. Increasingly library facilities bring together a range of services for users and it is not uncommon for libraries to house cafes and restaurants, combine their services with museums or art galleries and also be a place for the delivery of local government services within the library. As new types of integration develop we are likely to see new configurations and forms of the library and new names for such organisations.

Developing Learning Communities

One of the challenges facing the development of web based and virtual learning service provision is the creation of learning communities that provide effective support for individual and peer group learning. Many web sites put a lot of resource into promoting their resources and creating a community of users to identify with their site and services linking their physical outlets to the virtual. The potential to create and combine online and physical environments and create and maintain learning communities seamlessly online and in physical libraries is an area of opportunity. MOOCs and the flipped classroom, for example, will be more effective if local networks operate to enhance the experience. The more libraries can do to create technology rich spaces with learner focused service provision for all, the greater role they can have as open learning environments enabling learning communities to develop.

Creating the 21st century library

It is my view that rather than being of reduced importance in the 21st century libraries now have a greater role to play than ever before. 21st century libraries need to continue to develop their role as centres of learning and community by rethinking the space and services that they offer. The 21st century library goes beyond gratuitous social space, defies categorisation as a third place and is an essential part of 21st century learning infrastructure both within universities and the public sector and at local and national level. A 21st century library is not merely 'for good company and lively conversation' but enables, through a broader provision of services, links to the unexpected encounter and the chance conversation that are at the

heart of Johanssen's (2004) 'Medici' effect – enabling the emergence of new ideas for the conceptual age. It is a space that is flexible and responsive, dynamic not static, for users not librarians and its development and success is more art than science. The 21st century library is not a third place it is a subtle combination of Oldenburg's first and second places providing a place for work, leisure and learning with the feeling of home it is an act of creativity – the artist can paint over to change his work. The librarian erases lines and creates new vistas through the flexibility afforded by open space and the imaginative reconfiguration of the contents of the space. We do not spend enough time engaging in creating and recreating the space we have in our libraries. A successful 21st century library does not stop experimenting at the first successful space configuration but is dynamic and constantly pursues a better library.

Developing a new library or learning space is an act of creativity. Rather than retreat to a place of comfortable certainty that repeats what we already know, projects need to experiment to play their part in the evolution of the library ecosystem providing a platform for future innovation.

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for libraries of this massive increase in information resources on the internet is not just that information is their core business and their users will need and want to access it but also that such a resource creates more opportunity for informal personal learning than ever before. This increase in learning opportunities has consequences for libraries. Aspects of 21st century approaches to learning will be touched on later in this paper but for now it is important to note that like schools, colleges, universities, archives and museums, libraries are a key component of the learning infrastructure of a nation. We should also acknowledge that every library is a response to its locality as well as the resources it has and each exists in the context of the broad global factors that are mentioned above – so the points made above should not lead us to believe that there is a single response to the local and global challenges but there are common threads. Libraries have an important role as places of learning and as the internet drives an unmet need for independent personal learning then an increased need for more learning facilitation and support develops that gives libraries an important future and an opportunity to really claim their place in the national learning infrastructure.

To quote Stewart Brand (1995), every new (or refurbished) building, including libraries, is a 'prediction about the future' as, although new spaces have to be fit for purpose on their first day of opening, they must also, more importantly in my view, be fit for an unknown future. Being fit for the future is the biggest challenge facing any new development especially, as Brand also writes 'predictions [about the future] are always wrong!'. So – there are no right answers. The aim of the rest of this paper is to think about and better understand what is happening with learning, technology, and experiences that can inform the development library and learning space in these early years of the 21st century.

Thinking about learning

Libraries have always been places of learning, supporting personal exploration of the information and knowledge held in their collections and also being a place for researchers to learn and for the learner as researcher. Equally instruction on how to make best use of the resources held by the library and how to access its services has always been part of the work of the library either through documentation distributed to users or specific training courses. This role has further developed with the growth of e-resources with libraries acting as information brokers. In these ways libraries are already part of the national, and international, learning infrastructure but there remains much more scope for them play a greater role in community, societal and individual learning by developing support for learners and their learning in the physical and virtual library. Understanding learning support that goes beyond instruction is an important first step in assuming this greater role.

In the late 20th and early 21st Century theories and models of information literacy have been developed in the library context - for example in the UK both SCOUNL, an organisation that supports libraries in the HE sector and the National UK Libraries, and CILIP, providing support to all member librarians, have developed structured models for the provision of information literacy training and education. Some of these models were informed by current learning theories, for example, the SCOUNL seven pillars model (2011) (with the recent addition of a cyclical representation of the pillars) is strikingly similar to Kolb's model of learning (1984) acknowledging that for learning to occur the learning experience requires a phase of reflection, to then learn from the experience, and then plan and conceive the next experience. However, in practice most uses of models such as the seven pillars do not consider all of Kolb's stages but tend to focus on information finding. Making the shift from an operational 'consumer view' of the library as access to learning resources towards the library playing an active role in the process of learning is one of the challenges for models of information literacy and for the library's real involvement in learning. With this shift comes a second most important change of perspective – consumers in the modern library become producers as Lorcan Dempsey (2010) suggests the outside-in library of the past, that collects resources in a place for users to use, becomes the inside-out library that enables users to become producers and the library makes their products available beyond the confines of the building.

In the 21st century technology has become a key part of the skills environment required to access and handle information and develop new knowledge. Inability to use technology effectively is an insurmountable barrier to information access and use. Upto 30 years ago many libraries led the way in IT training refocusing their efforts on IT literacy as a necessary precursor to information skills. Unfortunately much of this work, as in school systems, took something of a cul-de-sac by focusing on instruction in the use of commercial software rather than the generic transferable understanding of IT as a tool for personal creativity and production. Emerging new technologies are fortunately enabling users to move beyond this episode by providing intuitive interfaces and applications. As we move to the next stage of digital and media literacy and a 'participatory culture' (Jenkins 2013) we need to rethink our library and learning space provision, the contribution that the library can make to communal and individual learning, and to revise our view of learners as consumers of information to one of constructors and producers of knowledge.

We live in a conceptual age

Ken Robinson (2013) claims that :

Current systems of education were not designed to meet the challenges we now face. They were developed to meet the needs of a former age. Reform is not enough: they need to be transformed

Continuing to educate using only an 'industrial' approach is highly questionable at the current stage of societal development described by Daniel Pink (2005) in his book 'A Whole New Mind'. Pink identifies a societal transition over the past 200 years from an agricultural to an industrial and, eventually, to an age of information/knowledge. Much of what we currently read, what determines how we configure our libraries, and what we 'teach' in our libraries relates to this information society and methodologies we use to teach it are informed by the instructional approaches of the industrial age. In these early years of the twenty-first century Pink sees a new significant societal shift with the emergence of a conceptual society—a society that values personal attributes such as creativity and empathy as the most important individual and collective societal assets. This conceptual society is about creative capacity and the ability to generate new thinking and ideas that forms a new basis for global individual participation and national competitiveness – an ideas economy. Education is the only resource that we have to be competitive in any economy, not least an ideas economy, and rethinking how we can shift our education systems from their focus on instruction to enable learners to develop broader skills is the challenge. Thinking about new library and learning space requires an awareness of the changing nature of the activities of both teachers and learners in order to ensure that services and resources are used to the best effect. Freeman (2005) sees libraries "as an extension of the classroom" concluding that "library space needs to embody new pedagogies, including collaborative and interactive modalities".

There has been increasing emphasis on how learners develop through informal learning that occurs outside the classroom in recent years, for example the impact of the Massively Open Online Courses (MOOCs) that are rapidly developing in higher education worldwide. When lectures are 'delivered' on mass online it is what happens outside of these events that is the 'real' learning. Libraries of all types, and their spaces, consequently have a more important role than ever before as places of learning in what is becoming a truly mass education system. In such a 'flipped' system, libraries, in both the education and public sectors, need a vision and purpose about people and how they learn and to make a real contribution to the learning that is appropriate to the conceptual society. 21st century libraries are at the confluence of the information and ideas economies valuing and supporting the learner as producer and recognising the reality of Jenkins (2013) participatory culture.

What's happening with learning?

John Seely Brown (Brown and Duguid 2000) believes that: 'learning is a remarkably social process. In truth, it occurs not as a response to teaching, but rather as a result of a social framework that fosters learning'. This theme of the orality and sociality of learning, which

sees knowledge as both a social construct and a result of social interaction, is rooted in a Vygotskian social constructivist view of the world (Pass, 2004). Our common understanding of 'social' is devoid of a learning perspective and focuses on the importance of interactions with others in informal get-togethers. However, the main activity in such gatherings is conversation and as Seely Brown (2000) notes:

“All learning starts with conversation”

This simple statement is easy to dismiss but in fact describes a far-reaching and deeply important idea extending our view of what 'social' is from the sociality of interaction to the sociality of learning. Conversation, an important component much human interaction, plays a key role in the whole range of learning (and teaching) activities and involves not just conversations with peers and teachers but also with materials, resources and technologies (for a more detailed conversational framework and discussion see Laurillard (2002)). Conversation contributes to a wide spectrum of learning activities that include: acquisition of and inquiry about knowledge and information, discussion, practice, and collaboration and production. Conversation is also a key component of a wide range of current learning theories including social constructivism (peers checking their understanding through conversation), instructionism (teachers' presentation and explanations), constructionism (conversations with ourselves that modify our conceptual frameworks), and situated learning (co-creating knowledge in the situation you intend to use it in).

Laurillard's model presents a broad unrestricted view of conversations: including the one way 'conversation' of the lecture or presentation as well as the multi-channel conversations of team and peer group work but also, importantly, the private conversations with ourselves inside our heads that serve to structure and consolidate learning experiences:

When I was a kid growing up in Far Rockaway, I had a friend named Bernie Walker. We both had "labs" at home, and we would do various "experiments". One time, we were discussing something - we must have been 11 or 12 at the time - and I said, "But thinking is nothing but talking to yourself inside." (Feynman 2000)

The importance of conversation to effective learning is clear in both social and personal contexts as is the point that the current focus on social learning is not a replacement for all that has gone before but more correctly an attempt to address the universality of one way conversations that characterize instruction. The opportunity for libraries, as learning places, is to contribute to this rebalancing. The challenge is, through the facilities we create and the services we offer in our libraries and learning spaces, to rebalance education systems that have for too long focused too heavily on instruction. In considering the nature of learning to inform our libraries of the future, we should avoid overt enthusiasm for social learning recognizing that learning is socio-personal and diverse. New library and learning space should reflect the diversity of conversational possibility redressing the balance between social construction of understanding and the instructional acquisition of information. Libraries should provide environments and experiences for learners that enable them to challenge and develop their frameworks of understanding through as rich a variety of conversations as possible. Carefully constructed social learning space with a variety that supports all types of conversation from active engagement with others to solitary reflection enables learning – the creation of social space alone will not. Given appropriate space how people supporting learning in the library participate in the conversations and create the experience is crucial to the effectiveness of the space. Librarians can play a significant role in learning because they understand resources - the primary material of the learning process. The range of open education resources is expanding rapidly (Bonk 2009) and now provides a basis for librarians to build further on their key skills enabling them to find their place as learning facilitators in the learning library.

It's not just diversity of conversation but also intelligence

Howard Gardner's research (2006, 1999, 1993) in educational psychology makes it clear that

intelligence is not a singular concept but that learners all have a wide range of facets to their personal intelligence – and consequently are all intelligently different. The clear message from this work is again the existence of individual difference and the inherent variety of need exhibited by learners. There is also now an acknowledgement that learning has an important emotional component. Positive and negative emotions can improve or hinder learning. Jensen (2005) reminds us that not only are emotions important as drivers and barriers to learning but that they are present all the time, connected to our behaviours and transient - continuously dynamically changing. It is also clear that the dynamic nature of need is complex involving as it does emotions, personality and intelligence factors. The result is a complexity of *the personal context in which people learn* that demands we strive continually to understand in experiential terms what environments might work and what will not. Spaces that we create can improve or hinder learning through the subtle effects that they have on those who inhabit them. Italian teacher and psychologist Loris Malaguzzi believed that children develop through interactions, first with the adults in their lives – parents and teachers – then with their peers, and ultimately with the environment around them. Malaguzzi believed that the environment is the third teacher.

Some implications for library space

The environment in which we work and learn can indeed influence how we feel and how we learn. Rizzo (2002) provides some useful guidance derived from exploring the expectations of academic library users for types of environments that they seek. Rizzo lists 4 types of space:

- (1) Highly active and engaging communal places
- (2) Interactive collaborative places for individual research and group work
- (3) Quieter less active places such as reading/ study rooms and alcoves
- (4) Out of the way contemplative places for quiet reflection and deep thought

These general types of space give us a useful framework for thinking about what a 21st century library can provide. These types are neither definitive nor exclusive but are a starting point and open to extrapolation, extension and fusion. The extent of any marketplace type space (Rizzo's type 1) and monastic space (Rizzo's type 4) and the balance between them will vary from library to library. Thinking about the balance of these types of space means considering the extent of 'noisy' social or social learning space of types 1 and 2, currently in vogue in many UK libraries, versus the quiet and silent spaces of types 3 and 4 of the more traditional library. The reality of changing user expectations and 21st century ideas about learning encourages a shift from types 3 and 4 to types 1 and 2. This is expressed clearly by Lankes (2013) in the idea that "Today's great libraries are transforming from quiet buildings with a loud room or two to loud buildings with a quiet room. They are shifting from the domain of the librarians to the domain of the communities". A **successful** 21st century library will need to have a balance between types of space that meets the needs of the communities that use it. However, a **really successful** 21st century library, will have a dynamic balance that exceeds expectations and can morph over the annual cycle of use to closely match demand over time. A clear example is the increased demand in educational organisations for more quiet study space in their libraries around exam time as compared with the need for more group study space during project working. Making such changes can be as simple as flicking a switch that changes the colour of the space by changing the lighting or deploying semi-private structures or partitions to provide privacy or space for group activity that does not interfere with the activities of others nearby. The least successful spaces are those that don't match user need and are unable to adapt to changing short-term demands. A variety of spaces that are balanced and dynamic will ensure that provision matches need over time.

Variety and Flexibility

So from a learning perspective a variety of spaces that acknowledge individual difference, conversational learning and emotional factors, rather than ignores them, demands a new approach to what we provide in our libraries and how we provide it. One clear message emerges – there is a wide range individual difference amongst our library users that stems from an inherent variety of need and that these needs change over time. This suggests a real

requirement for variety of space provision in our libraries to give learners real choice. But this variety is not about separate space silos. It is about recognising that we are social animals with distinctive contributions and that we construct our frameworks of understanding within a powerful conversational framework that includes a continuum of interactions with resources and technology, listening, participating, contributing, reflecting and producing. Learning will always be the responsibility of the individual; libraries currently, through their resource collections, supply the resource inputs; they need to do more to embrace, encourage, stimulate and promote the producers of future knowledge. Shifting the focus of library space to the activities of people as learners and producers in the context of the rapidly emerging conceptual age requires us not just to understand how people learn but also how the spaces that we provide can support them.

Technology and the Library

Over the years libraries have used technology to improve operational efficiency by adopting IT systems that automate their operations and services focusing on the acquisition, management and circulation of resources and more recently extended, somewhat imperfectly, to the management of digital resources. By contrast the use of technology in relation to library space has been somewhat neglected. Extensive hardware provision, networking and self-service facilities have been the most noticeable aspects of 'technology rich' space along with some investment in electronic signage and display screens. The idea of the commons, such as IT commons and Information Commons (Watson and Anderson 2008), has involved the creation of ever larger installations of serried ranks of networked desktop machines, in most universities and many public libraries, reminiscent of battery chicken style 'farms'. Such unpleasant environments are a long way from the learning enhancing environments envisaged in previous sections of this paper. In most cases where technology is added to existing or even new library space it is clearly a bolt on solution that does not serve to enhance the space.

The rate of technology change is accelerating. Seeing what technology will do next is therefore not easy and spotting which technology innovations are likely to become ubiquitous, and of real importance to library space development, is a much bigger challenge than it has been in the past. How will IT developments that now seem irrelevant to libraries such as driverless cars, google glass, 3D printers, cloud computing, the social web, wearable devices, robots, machine intelligence or the products of nanotechnology affect the library? And which of these, if any, might ensure a brighter future for libraries over the coming years? This incomplete short list is just the technologies that we have now – the reality is that the continuing development of technology at a rate of change² (the rate of change squared) will have more fundamental effects than we can currently imagine. Ray Kurzweil (2006) predicts that by the end of the 2020s computers will pass the Turing test—that is a machine will be able to participate in a conversation so competently that it will be indistinguishable from a human being. Will we continue to need staff in libraries to provide guidance and deal with queries? When this and other unimagined developments happen it surely takes us beyond adoption or even adaption to a need for libraries to embrace and assimilate technology. Computers are certain to be self-repairing, self-replicating, and responsible for their own further development not too far into the future making change² even more challenging. The consequence of this increasing pace in the rate of change and our failure to see it is that the impact of technology on all aspects of life including libraries and the work of librarians will be enormous, deeply important and largely unexpected. Change² brings uncertainty and suggests that we need to fundamentally rethink the form and function of the library as a place. Why will people choose to go the library? To answer this question in the context of technology libraries need to closely evaluate the library-technology relationship.

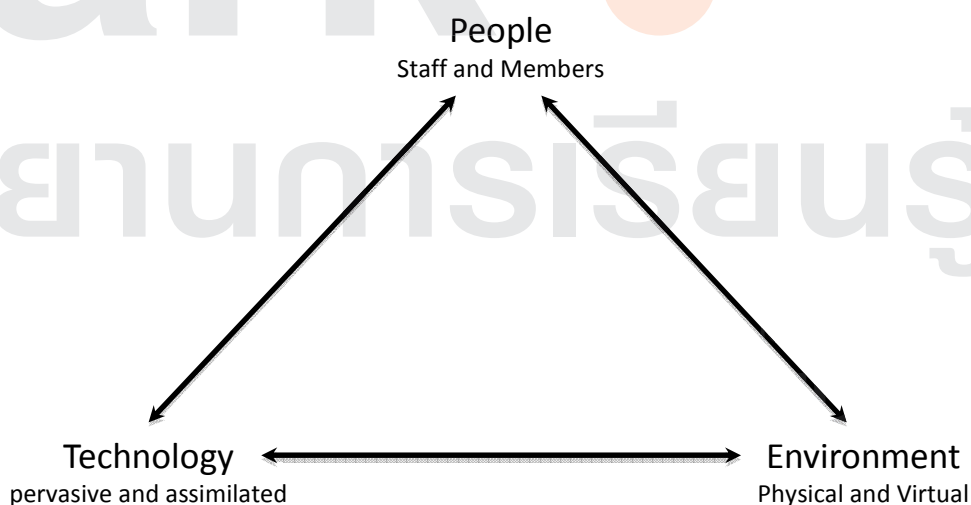
The Library is Technology

"Technology is anything that was invented after you were born"

Alan Kay

Libraries have responded to the technology of information and communications with responses that are often simply bolted on to existing facilities and services. Mostly adoption with little adaptation. When the technology has a specific role such as microfiche or printing technology this works well. It is when a generic technology all-purpose technology, such as the personal computer, has been adopted that the implementation has been disappointing. Kevin Kelly (2010), co-founder of Wired, likens individual technologies to species in a rapidly evolving technological ecosystem that he calls the technium. Kelly's technium is a technology system that "extends beyond shiny hardware to include culture, art, social institutions, and intellectual creations of all types" and consists not just of all the tools that have been invented by the human race but also all the systems that enable us to manage, develop and use these tools. Kelly believes that over the centuries the technium has evolved in parallel with biological systems. From this perspective the library itself is a technology, a system within the technium that has emerged to enable continued use of technologies such as tablets (of stone), through hand written manuscripts, to the printed word, digital artifacts and multimedia materials. The deeper question for the library then is what is the next form of the technology that is the library? Such a question goes way beyond considering the tactics of technology adoption and adaption by libraries. What is needed is for the library to internalise and assimilate technology using imagination to take the technology that we currently call a library to its next technological stage rather than continue the current position in which libraries bolt on technologies as they emerge.

One of the directional characteristics of Kelly's evolving technium is that as it evolves it creates greater opportunity – specifically opportunities for human betterment through the extension of our intellectual and creative capability. The consequence of greater opportunity is more choice and Kelly believes that "we [as humans] need the full spectrum of choices won by the technium to unleash our own maximum potential". In Kelly's view we should "always act to increase choice". The idea of library as a technology system and of developing the library as a system that works to increase choice provides a powerful perspective that takes us beyond bolt on technology implementations and puts the focus firmly on the members (users and staff) of the library. A bolt on approach to technology is a tactical one and can never take the library to its next technological level. Bolt on approaches tend to adopt technologies only when safe to do so. For technology to be internalised and assimilated by any organisation it has to be future focused and integral to the strategic framework of the organisation. Technology has to enhance the work of the people of the organisation and be integrated into its environment as suggested in the diagram below:



Whilst this strategic approach will not predict the future it does provide a framework for thinking about technology and how it interacts with other factors within the technology

system that is the library. An important aspect of this framework is that it highlights the assimilation and integration of technology with other key resources. Considering these factors together is more likely to ensure that they work in synergy and add value to each other rather than work against one another. Thinking, strategising and planning around any one of these three factors must embrace its interaction and impact with the others and in doing so is more likely to produce additive effects and benefits as compared with considering them separately. A simple example might be that in the past it has been common for libraries implementing self-service solutions to site the machines on or near the desk with the effects of cluttering the space on or around the desk and creating uncertainty for staff and library members about when, or whether, to use the new facilities. Negatively affecting the environment and potentially confusing people. Thinking about the real purpose of the technology, how we want the space to work and what our expectations are of staff and members holistically would suggest that placing machines away from the desk, as a first intervention when users enter the building with other machines distributed throughout the building would be a solution that not only enhances the environment but also makes the choice to use the technology more obvious to members and staff of the library. The key objective of an integrated technology strategy is the creation of a technology rich library space, both physical and virtual, that provides users with service options and choices underpinned by technologies that are unobtrusive and seamlessly integrated into the library experience.

So what does technology rich library space look like today?

Ubiquity

Current technology rich library space has ubiquitous networking both wired and wireless enabling library members to use technology devices throughout the space. Some of these connected devices are 'owned' by the library and include desktop computers arranged in a variety of ways for individual and group use but more importantly many of the devices are owned by the library user. The current BYOD (Bring Your Own Device) trend prevalent in higher education and public libraries lending e-books frees up users to bring their own laptops, tablets and smartphones to work in the library. This is a welcome change from requiring library users to use library 'owned' desktop machines partly because it acknowledges the personal nature of technology (as in PC = **personal** computer) and also because it enables users to work with their preferred applications software and have real time access to their personal cloud storage.

"What a person can achieve with an outdated machine in a public library with mandatory filtering software and no opportunity for storage or transmission pales in comparison to what a person can accomplish with a home computer with unfettered Internet access, high bandwidth, and continuous connectivity."

Jenkins (2013)

Importantly the use of these devices also enables users to choose where they work within the library selecting the environment that best suits their current needs. Mobility, however, is still restricted by the occasional need for access to power. A well-equipped technology rich library has an extensive under floor power grid and power sockets mounted on tables and informal furniture such as sofas. The technology rich library also reinforces the theme of ubiquitous distributed technology by the loan of mobile devices for use throughout the building. Alongside BYOD technology rich libraries will continue to provide some devices for those in their community that would not otherwise have access to it. Into the future providing greater technology choice involves exploiting wireless power as it becomes available in the next few years and new types of mobile wearable devices as they become the norm. Librarians have always been early adopters of technology (for example, using punched-cards and microfilm for activities such as issue systems, indexing and newspaper preservation in the early 1960s) and the library role of horizon scanning and showcasing new technological possibilities continues in the technology rich library –so expect early use of 3D smartboards and 3D printers in the technology rich library for example.

Technology management

Like most technology systems the technology rich library currently has both emerging and legacy technologies including books. The technology rich library will have taken a carefully considered approach to the balance between space for books and space for users adopting strategies such as annual stock reviews and deletion of items no longer required. Detailed knowledge of stock use (provided by borrowing stats for example) is essential to inform this strategy and also to extend the strategy into an active management policy that takes a strategic approach to the use of open access shelving, compact shelving and remote book stores to free up space for users. Imaginative solutions for holding books in the library should also be part of the technology strategy for example using books to create zones within the library, book walls to provide privacy and sound proofing and books to create inspirational features within the library. The adoption and use of electronic resources and digitisation enable the technology rich library to extend the space for people whilst at the same time increasing the scope of the collection. Careful and imaginative management of legacy resources is an essential first step in a library refurbishment or new build to ensure that maximum space can be provided for users.

Interaction with the building and its resources

Technology can also be embedded and used to have an ongoing conversation with members of the library as they move from space to space within the building. At a basic level electronic signage can be used to provide dynamic information for users on the library, its events and services. As in museums some libraries use QR codes that can be accessed from smart phones to explore deeper information or local information points can send information to mobile devices using Bluetooth connections as users walk past them. Interactive displays based on surface technology can be used to take electronic signage to the next stage providing novel ways of experiencing information such as those that can be used to explore local history resources by manipulating them on an interactive table top. Many libraries make extensive use of lighting technology to enhance the look and feel of library spaces – using light to modify the colour of a space throughout the day can have powerful emotional effects on mood and behaviour and is a real alternative to fixed colour décor. Similarly graphics can be used to create a range of environments within the library to encourage active group work or quieter behaviour. Audio devices can provide variety to the way that information is presented for example by using sounds at entrance point so the space to add to the user experience such as a Ssssh as users enter a quiet zone or the sounds of the marketplace as they enter the interactive group space.

Knowing users and their needs

All libraries strive to obtain data on how members use the library and how the facilities and services can be improved – technology has much to offer to assist with this. Simple data is easy to collect (such as the footfall mentioned earlier in this chapter) and to understand but the real ‘user experience’ of the library is complex and difficult to understand. The dilemma is that if we stick with simplicity we can both collect and analyse the data if we seek a more in-depth understanding of our users and dig deeper both collection and analysis become complex and burdensome. Enter Big Data – recent developments in the ability not only to collect large volumes of data but also to use the technology itself, using complex algorithms and greater computing power, to analyse and understand this data is becoming possible. For the technology rich library this presents the opportunity to get a much better understanding of the ‘library experience’. In the late 20th century Mihaly Csikszentmihaly developed the technique of experience sampling. Using pagers Csikszentmihaly’s researchers were able to collect data in real time on how happy people were leading to the development of his now widely known flow theory of happiness. How much more powerful could this technique be using today’s mobile devices combined with Big Data to get a genuine understanding of the library experience. The experience sampling method has the potential to provide real insights as it overcomes the tyranny of our current time lapse feedback methods. Collecting real time data, that rather than focusing on what happened in the past tells us what is happening in the present, and analysing and synthesising the results using big data techniques could enable us to also understand how users feel about our facilities and services.

The robots are coming

Mention robots to most people and the idea may well be met with disgust or disbelief - but the robots are coming and will have uses in the technology rich library. Robots are already playing a role in book repository retrieval using RFID and robotic arms are used to offload book hoppers onto conveyers. At present librarians are also still picking individual books guided by RFID scanners and may do so for some time – at least until the stand alone mobile robot that can search the shelves arrives. The form that future robots will take and when they will become socially acceptable is at present unknowable. However, the technology rich librarian should be thinking about what she or he would wish them to do. Providing the best environment for library users depends on making the best use of all resources – both human and robotic. Arthur C. Clarke is reported to have said “A teacher that can be replaced by a machine should be”. Any librarian that can be replaced by a robot should also be – librarians have more meaningful work to do.

It's the experience of physical space that is important

Creativity is at the heart of the conceptual society mentioned earlier in this paper. In his work on 'the creative class' Florida (2003) reveals, importantly, that contrary to our expectations about connected net-aware creative people they still do value place:

“The death-of-place prognostications simply do not square with the countless people I have interviewed, the focus groups I've observed, and the statistical research I've done. Place and community are more critical factors than ever before... the economy itself increasingly takes form around real concentrations of people in real places”

indicating the need for the continuation of the library as a physical place. According to Florida, from his work with focus groups of creative class people, what is important are experiences:

“Experiences are replacing goods and services because they stimulate our creative faculties and enhance our creative capacities. This active, experiential lifestyle is spreading and becoming more prevalent in society...”

Writing about the 'Experience Economy' Pine and Gilmore (1999) describe a progression of customer needs from commodities to goods then services and ultimately experiences. Providing excellent library experiences should be one of the primary aims of any library and learning space development. How users experience the library is dependent on the quality of the space, how it is organised and the services provided within the space – space and service are inseparable and interdependent. Where space and services are designed and managed to fit perfectly with expectations, and change over time as expectations change, excellent experiences will be the outcome. Consequently the library as a place should become a focus for association and activity and home to a wide range of facilities and services preserving the best of the information, support, services, community and resources that have traditionally been provided – the experience should be, and feel like, more than just a library:

“People forget what you said, they forget what you did, but they never forget how you made them feel”

Maya Angelou in Prahalad and Sawhney (2011)

Making library buildings 'an experience' is a fresh perspective that demands we think about their look and feel in considerable detail. Richard Florida's work illustrates that place remains important to members of the conceptual age and the importance of thinking of our buildings as experiences cannot be underestimated. The designer Karim Rashid expresses this well in point number 43 of a 50 point manifesto: 'Experience is the most important part of living, and the exchange of ideas and human contact is all there really is. Space and objects can encourage increased experiences or detract from our experiences' (www.karimrashid.com). Such thinking takes us beyond customer service to a requirement for intimate knowledge of those that use our facilities that translates into an understanding of how they experience, and

how they feel about how they experience, our libraries and learning spaces which clearly highlights the importance of the discussion on big data in the technology section above.

A word on the Third Place

Much has been written about Oldenburg's (1999) idea of the Third Place:

Third places are neither home nor work - the 'first two' places - but venues like coffee shops, bookstores and cafes in which we find less formal acquaintances. These comprise 'the heart of a community's social vitality' where people go for good company and lively conversation

Many of the ideas discussed briefly in the previous section can be applied to the third place concept. However, the danger of the Third Place model for the library is that it talks only of sociality, company and good conversation but not of purposeful work and learning through conversation. As a stimulus to development this concept is a step on the path and has been a useful touchstone. Future libraries, however, need a model that combines the third place with the productivity of the second and first places of work and home. Indeed an important aspect of library space is often to create a 'study home' for those users who do otherwise have such a place.

Some realities

Hugh Anderson and I (2008) carried out a survey of a number of UK further and higher education institutions to identify which of these tangible factors proved to most problematic. By a clear margin heating and ventilation caused the most issues for the spaces in our survey, closely followed by noise. Many libraries and learning spaces are felt by users to be too hot in the summer and too cold in the winter and users of the space often complain about the lack of local control that they have over heating and ventilation. Ensuring that temperature and ventilation controls are rigorously modelled is an absolutely essential pre-requisite to project success that must be undertaken in the planning stage of the project. Issues around noise were often mentioned to us in our survey, particularly in respect of large open plan spaces, but in spaces where strategies such as zoning and semi-private structures (see later in this paper) were deployed noise was not an issue.

Amongst the factors that were felt to be less problematic were lighting and smells. Whilst it appeared from the survey that there was a general satisfaction with lighting arrangements our feeling was that this was often a missed opportunity to introduce additional impact into a space by using lighting that could add interest and provide an easily manageable way of providing colour flexibility – a key factor in determining mood that can also send subtle signals about the purpose of a space that was mentioned earlier in this paper. The advice here is also that sufficient consideration be given to lighting not just as the necessity of conforming to standards but as an additional way of enhancing the emotional impact of the space.

With the increasing prevalence of food and drink in library and learning spaces care should be taken where possible to ensure that smells are not intrusive and the advice is the planning of ventilation systems should take food and drink into account as it is now becoming the norm to have refreshment facilities in libraries and learning spaces.

However, in spite of all the things we know we know, it is the things that we don't know that can force a project off course but, paradoxically, it is also these unknowns that can make a project great. Alongside the certainty of getting tangibles such as heating and ventilation right there will certainly also be uncertainty, for example about the effects the lighting system might have. However, it is impossible to remove all uncertainty in a project so we must have flexibility in what we build to provide the facility for modification and change if needed.

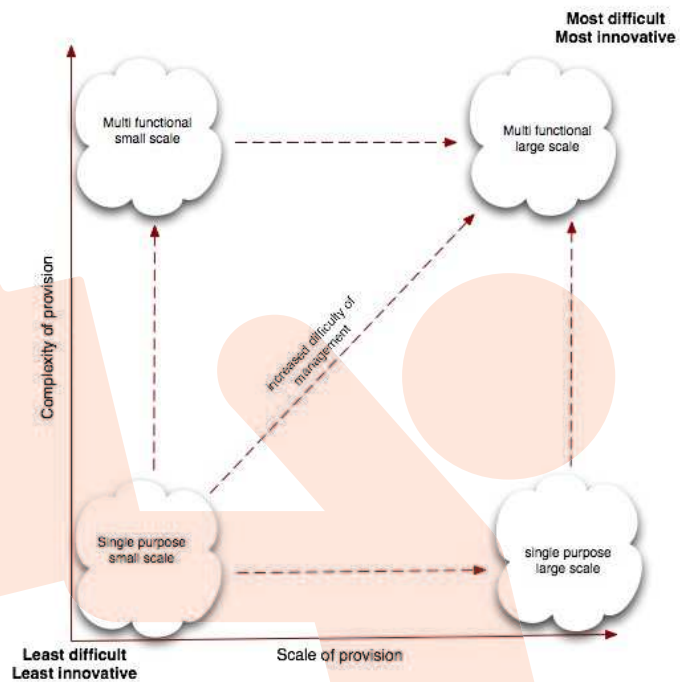
Trends and ideas - space

Open Plan Space

For new build projects the most common modern approach has been to provide open plan space. Open plan deals with some of the uncertainty mentioned above and brings the promise of ongoing reconfiguration as the building learns, through use and emerging trends, what is required of it as a space. Flexibility for the future is the key desirable feature of these spaces exemplified by the ground floor services mall in the Saltire Centre at Glasgow Caledonian University (see www.leswatson.net). Most importantly, in the most successful implementations of open plan, there has been careful consideration of how the areas connect avoiding unnecessary traffic through the buildings with poorly located 'feature' stairs, or ill-conceived mezzanines or lightwells overwhelming open spaces simply for architectural effect. It is harder to be wrong about the future with open space that offers endless possibility. But open plan is not without its critics who focus on the potential for noise and lack of privacy. However, careful selection and positioning of furniture and location of book stacks contains noise and provides some semi-private space (see below). Importantly open plan also provides the opportunity to regularly 'redesign' the space by introducing new structures and items of furniture or rearranging existing furniture (relatively straightforward) and book stacks (more difficult and resource intensive) to create quiet and noisy zones for example. Open plan is an important feature that brings the prize of flexibility but this has to be balanced by a zoning strategy (that is naturally provided by walls in some older buildings).

Open plan versus enclosed space

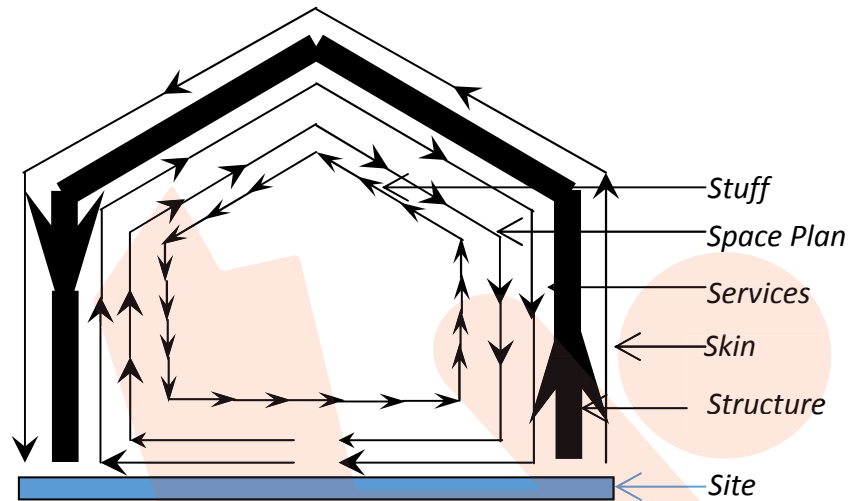
In open plan technology rich space the detail of the space is defined by furniture, fittings and equipment, and can easily be changed making experimentation with the space relatively straightforward. Open plan originated in offices around the middle of the last century and came about partly to squeeze as much accommodation as possible from the space available, but also to address the need for flexibility arising from changed working practice and the introduction of IT. The design of libraries and learning spaces now has similar pressure to squeeze more use out of the space available. Over-simplicity in meeting the combined needs for flexibility and high levels of occupancy, for example by providing office accommodation in massive open space crammed with screened off cells, can lead to universal dislike of such spaces with the accompanying difficulty of user unhappiness. Potentially modern open plan library space can lead to similar problems if it lacks variety and interior design, but if planned carefully open plan space is not just flexible but also allows for variety, flow and complexity. Open plan space done well provides inspiration, stimulation, curiosity, interest, opportunities for vicarious learning, a sense of community and choice and excitement for those that use it. With flexibility, however, comes potential complexity. In the diagram below (Watson and Anderson 2008) the scale and complexity of a space are compared:



The diagram illustrates the idea that large open plan spaces carry with them, in addition to promise of greater potential for change and ongoing innovation, the inevitable overhead of difficulty of management. Any project must consider this tension between difficulty of ongoing management and potential for innovation at the planning stage. Open plan technology rich space is not a panacea and an important initial consideration in the development of library and learning space has to be the realities and practicalities of ongoing management of the space – there is no point building for the flexibility that open plan technology rich space can bring if the resources needed to manage the space cannot be made available into the future. The issues expressed above in respect of open plan office space also warn against extreme use, particularly overpopulation, of open plan learning space. In selecting open plan versus cellular space a key question to consider is which activities do we wish to continue into the future that will require specialist use or need to be enclosed for other reasons. Honesty is needed when addressing the question of whether fixed full height walls are really necessary for an activity is crucial– realising that in most situations it is always easier to argue for the status quo than for change – change is the experiment. Flexibility is a desirable characteristic of space allowing innovation and experiment making it ‘fit for the future’ but it does have a cost of ongoing complexity of management.

Flexibility

Doing all the future thinking for a 2 or 3 year project, a new build for example, means that the completed project is potentially 2 or 3 years out of date on completion. However, project management and implementation can, to some extent, run in parallel with the consultative processes, workshops, conversations, discussions and daydreaming required to develop a great project recognising that any significant changes in the project at a late stage are expensive and must be avoided if at all possible. The components shown in the diagram below have varying rates of change, for example the site on which the building is constructed is eternal and shows little change over time as opposed to the Stuff in the building (most items of furniture and fittings) that have a useful lifespan of say 7 to 10 years. This is not a hierarchy but each layer has its own speed of change and consequently its own replacement cycle. In a rapidly moving world it makes sense to locate the capacity for change in those items with the potential shortest life span. This idea translates into the concept of Pace Layering shown in the diagram below:



Shearing layers of change. Because of the different rates of change of its components, a building is always tearing itself apart

From Stewart Brand - How Buildings Learn p.13

For buildings and new spaces this means avoiding creating some layers, such as fixed internal dividing walls, that have a medium term life span and are a potential barrier to accommodating changing activities. As stated previously once created cellular space is difficult to remove requiring building works. This idea of pace layering is touched on in the section on open plan space (above) in observing the importance of the ability of structures to start to act as furniture and furniture to start to structure a space that provides the greatest opportunity in the design of open plan spaces. The suggestion is that investing in furniture, fittings and equipment as the way of creating the internal environment and zoning (see below) the space provides greater opportunity for future flexibility. The idea of pace layering also serves as a guide to when each aspect of the project needs to be finally decided and become unchangeable – the least permanent, and potentially most important in terms of creating the environment, can be finally decided upon relatively late in the project.

Zoning

The overall tendency in libraries, even most existing ones, is for space to lean towards open plan rather than cellular. Currently such open plan spaces provide a home for the book stacks that bring with them their own potential zoning strategy regularly segmenting the space from floor to near ceiling height. Collection consolidation may give the opportunity to use the remaining stacks as 'book walls' to create effective zones, or small 'rooms' within an open space. In new space carefully selected furniture can be used to the same effect and has the advantage of being more easily reconfigured for future needs. Ideally, even in open plan space, zones can, and if possible should, arise out of the natural configuration of the building with the zoning strategy enhanced further by the strategic positioning of furniture or other fit-out items. The purpose of creating zones is for them to have a different environmental feel and purpose appealing to a variety of emotions and supporting the idea of variety discussed in the sections on learning above.

The degree of separation can vary depending on the height of furniture and fit out items used. Zoning does however have its limitations so that in the planning of a new library and its

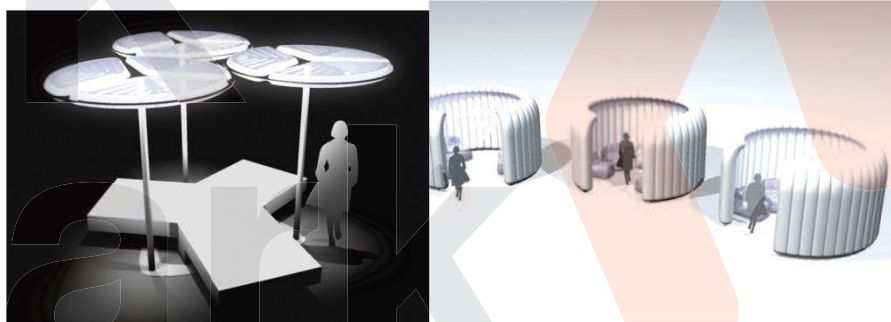
associated learning space it is important to ensure that the architecture of the building provides these separation needed between the extremes of environment desired – noisy and silent do not co-locate well. What is important is that zoning is another route to enabling choice, providing the kind of flexibility that enables people and activities to move about the building without the need for constant physical adaptation of the space. A well-zoned space will provide choice for users that is easily understood, supports interaction and also works against ownership of different parts of the building by different interest groups.

Semi-private space

Included in the category of ‘other fit out items’ - items that stand within an open plan space but provide a degree of privacy – what I call semi-private spaces. These can be used for two reasons. Firstly to shield the users of the library from the less tidy parts of library operations such as self-service machines, printers and book trolleys by enclosing them in pods or other similar structures. Secondly to partly separate members of the library from others in the large open space allowing an individual or group to work within open plan space yet feel that they are working in a private room.

In the first category structures can be constructed such as printer pods, trolley bays and self-service machine housings that not only serve to ‘hide’ these items but also enhance the environment. For example pods to house printing and photocopy services contain the noise and untidiness of the machines but also create opportunities for interest, through the use of graphics inside the pod, on an otherwise open floor.

The second point is the separation for members of the library who want to work individually or in a small group. Most new developments include some form of banquette, or diner style seating for example and book walls have been mentioned above. There is a range of semi-private structures that provide varying degrees of enclosure and sound separation such as mobile canopies, inflatable igloos, and umbrellas as illustrated below.



Concept for ‘street umbrellas’ and inflatable ‘igloos for the Saltire Centre at Glasgow Caledonian University

These ‘temporary semi-private’ structures are recognisably different from other furniture and fittings in the space and, as their continuous use and popularity suggest, appeal to users in other ways than just their ability to reduce noise. They serve to structure the space from a space planning point of view whilst interfering minimally with its flexibility. This recognition of the importance of the ability of structures to start to act as furniture and furniture to start to structure a space provides the greatest opportunity in the design for flexibility of open plan spaces.

Flow

The creation of space is not, however, merely about the range and balance of a variety of spaces (although these are important) but is also about how they interrelate and flow from one space to another. Crucial is how a fragmented feel is avoided and how, in the case of a part refurbishment, the ‘bolt on’ facility is integrated into the whole. Much has been written about the library as Third Place as mentioned earlier, those places that are not work and not home but that hold special significance to those who visit and use them. According to Mikunda (2006) the creation of a third place should have a ‘golden thread’ (flow) running

through it that encourages users to 'mall' and to explore it. Using the tricks of suspense and revelation such places also often have a landmark or core attraction that arouses curiosity – the 'wow' that is so often found in new spaces and buildings. Examples include public works of art, impressive atrium spaces and the furniture itself deployed in the space. Flow facilitates user journeys through the space. Landmarks and core attractions provide destinations.

Space and service are inseparable

Space and service are symbiotically linked and service change and improvement is always possible in any library but a rebuild or refurbishment enables more extensive experimentation with the range of services provided and how these are provided. It is common in many UK libraries to see improvement in the delivery of services through the use of self-issue and return facilities. Improvement is often focused on greater degrees of self-help where possible, removing barriers to service access and integration of services. By providing a larger number of service points than usually needed service desks can be designed to 'expand and contract' by moving staff from other duties to the desk when busy in order to respond to demand for services. For example by having a central desk (a seated desk, for staff and users) and two satellite desks so that if queues develop additional staff have somewhere to work and when these satellites are not being used then library users can make use of them. The barrier effect of the desk can be reduced by making it low level and building seating into it. However, in spite of these efforts to make the desk more of a shared facility between the user and staff, the desk can still be a formidable barrier between the two. The aspiration to reduce the impact of service desks and bring a sense of partnership to service delivery has been taken further with libraries using small informal pods at key points in the building. These small pods are also moveable providing the possibility for 'pop-up' delivery points. With such flexibility service strategies can be adopted that encourage staff to switch from roaming duties to desk duties as required providing an enhanced service for users that responds to needs in a timely way.

Service Integration

Another strategy for a future in which resources are constrained is integration. Increasingly library facilities bring together a range of services for users and it is not uncommon for libraries to house cafes and restaurants, combine their services with museums or art galleries and also be a place for the delivery of local government services within the library. As new types of integration develop we are likely to see new configurations and forms of the library and new names for such organisations.

Developing Learning Communities

One of the challenges facing the development of web based and virtual learning service provision is the creation of learning communities that provide effective support for individual and peer group learning. Many web sites put a lot of resource into promoting their resources and creating a community of users to identify with their site and services linking their physical outlets to the virtual. The potential to create and combine online and physical environments and create and maintain learning communities seamlessly online and in physical libraries is an area of opportunity. MOOCs and the flipped classroom, for example, will be more effective if local networks operate to enhance the experience. The more libraries can do to create technology rich spaces with learner focused service provision for all, the greater role they can have as open learning environments enabling learning communities to develop.

Creating the 21st century library

It is my view that rather than being of reduced importance in the 21st century libraries now have a greater role to play than ever before. 21st century libraries need to continue to develop their role as centres of learning and community by rethinking the space and services that they offer. The 21st century library goes beyond gratuitous social space, defies categorisation as a third place and is an essential part of 21st century learning infrastructure both within universities and the public sector and at local and national level. A 21st century library is not merely 'for good company and lively conversation' but enables, through a broader provision of services, links to the unexpected encounter and the chance conversation that are at the

heart of Johanssen's (2004) 'Medici' effect – enabling the emergence of new ideas for the conceptual age. It is a space that is flexible and responsive, dynamic not static, for users not librarians and its development and success is more art than science. The 21st century library is not a third place it is a subtle combination of Oldenburg's first and second places providing a place for work, leisure and learning with the feeling of home it is an act of creativity – the artist can paint over to change his work. The librarian erases lines and creates new vistas through the flexibility afforded by open space and the imaginative reconfiguration of the contents of the space. We do not spend enough time engaging in creating and recreating the space we have in our libraries. A successful 21st century library does not stop experimenting at the first successful space configuration but is dynamic and constantly pursues a better library.

Developing a new library or learning space is an act of creativity. Rather than retreat to a place of comfortable certainty that repeats what we already know, projects need to experiment to play their part in the evolution of the library ecosystem providing a platform for future innovation.

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