New information and learning landscapes challenges to bridge the information 'gaps'

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Abstract:

Intro: Theoretical approach: none the worse for that; standing back from details.

Intro: 'text to techno' ? Is the 'new' LIS 'scene' that simple? No: don't believe it to be so. Reasons why!

What constitutes the new 'landscape'? Like all landscapes – centres for attention need clarifying; horizons are indeterminate; visions misty and clouded; detailing incomplete; positions of observers dominating factors.

Both Sections' 'Call for Proposals' refers to 'this gap' in one place: in another 'all sorts of information gaps' – in the plural. With the pluralism we agree: consequently our position & starting point.

 Identify what are these 'Gaps'??

These Questions [with attempts at answers] provide central 'core' of presentation.

*1.	First gap – between those taught and those learning – generational & attitudinal ['X' to 'Net'!]*

*2.	Technology take-up – social media & tools & apps, smartphones, tablets, laptops, e-readers etc*

*3.	Learning habits [advanced in student-users]/ practices versus traditional teaching practices ['X' or 'Y' generations' delivered]*

*4.	Effects on environment - buildings layouts & designs; services' provisions; providers' expertise > users' expectations*

*5.	Information [formerly] 'famine' > now 'flood' – how - for users - to select = providers' qualitive / expertly - informed judgments*

*6.	Early Information Literacy concepts [Zurkovsky, Eisenberg & Berkowitz, ALA, Prague & Alexandria Declarations] > changed practices = considerations for new concepts & changes to definitions / 'models ['Big 6' + 'Empowering 8'] - to be grounded in current usage and for future continuing relevance.*

*7.	LIS curricula to cope – what was taught > what now needs to be taught and 'how' and by whom?*

*8.	No convergence > 'traditional' librarianship enhanced > to much developed 'information science' analyses, knowledge, competencies and skills [firmly founded in academic and scholarly-acceptable theories and practices – as in the past]*

*9.	Gap within service providers: 'traditional' librarianship ['text' ??] versus innovative information / knowledge advisors ['techno' = 'Cybrarians']*

*10.	'Library services' providers ['text'] only? Not now adequate? – for much larger 'landscape'*

[= the 'gap'] hence need to 'think out of the box' 'cos this alone too narrow & restrictive! 'Technos' = 'Cybrarians'.

*11.	Increasing division of profession - between 'Librarians' and 'Cybrarians'*

Change [to 'bridge' gaps] requires 'change agents' to achieve. Where / Who are they – teachers / educators? LIS teachers? Users - Net Generation? Programmers? Library staffs? Commercial suppliers / Publishers?

Choices: 'Close / bridge the gap'? Alternatively – let it be: instead 'start afresh on the other side'?

Summary: 'gaps' can be perceived as problems: also as 'challenges to be met'. Preference - for the last: but how?

Question: Will the 'new' Profession cope? !!

Introduction:

'Text to techno' provides useful, and simple, two words to illustrate situations now facing the LIS profession. However the profession's problems and resolutions of them are complex in the extreme. 'Landscapes' and environments are changing so fast that many [in and out of the LIS profession] find it difficult to keep pace. Yet the consequences for LIS of not keeping up and of getting ahead will be to condemn Librarians, and perhaps Information Scientists also, to future existences where usefulness to the societies served will be even more problematic than now. This paper will examine this thesis in three main sections: the 'landscapes', secondly, the 'gaps' and lastly the 'challenges'.

Background:

Firstly the background or context to these investigations: the 'landscapes' concerning us here are best represented by two revolutions.

Not in the last six hundred years [since the invention of printing from moveable type in the mid fifteenth century] have societies faced such a revolution in the transference of ideas and information as in the last couple of decades!!! This has been [and continues to be] a revolution of similar magnitude and significance. It is one that in just more than a single decade has transformed countries of the world from places, in the sixties through to the 'noughties', that were facing information 'famines' but today are flooded in information.

A century after Gutenberg's revolutionary invention [1440 to 1450] the British essayist, philosopher and politician [between 1561 and 1626] Roger Bacon observed: '*Nam et ipsa scientia potestas est*' = 'knowledge itself is power' [Religious Meditations. *Of Heresies*]. That is as true [if not truer!] today as it was then. A most relevant observation for the LIS profession concerned with information, without which little knowledge can be developed or transferred, witness the US / UK poet TS Eliot's ' Where is the wisdom that we have lost in knowledge? Where is the knowledge that we have lost in information?'

What resulted from Gutenberg's 'revolution'? [1] The printing and sale of 'indulgences' [considered to provide freedom from God's punishment for sins] and [2] Luther's [1483-1546] consequent declaration of this as heresy which led to the Reformation in Europe [1517 to 1648] and later centuries of religious wars [two Civil Wars in England 1642-5 & 1648], persecutions [the execution of King Charles I 1600-1649] and restrictions on religious freedoms, anti-popery, desecration of churches etc; [3] informed publics from greater access to reading from which arose their realization of political powers i.e. [in the UK] Hobbes [1588-1679 and his philosophy that man's obsession with power leads to wars], Locke [1632 – 1704 and concern for man's self-survival and thus his societies']; [4] to individualism evidenced in freedoms of expression; [5] to the speedy spread of ideas [cultural, social and most significantly political] via pamphlet publications; [6] to literary creativity Shakespeare [1564-1616], Jonson [1573-1637], Marlowe [1564-1593] etc; but [7] eventually to censorship [UK's Licensing Act 1737] and from these repressions – i. e. closures of theatres, censorship of plays etc!

I.   'Landscapes':

What are the constituent parts that, when assembled, constitute these new 'landscapes'? All landscapes present different pictures to those who observe them. 'New information and learning Landscapes' are no different. To view them correctly there are necessary requirements – to identify significant centres in them requiring clarification (i.e. what are the issues / points of significance that stand out to engage attention - usually as priorities [not, incidentally always at the centre of the picture!]); horizons indeterminate so consequently needing defining (i.e. beyond and over the horizon that at the present we cannot observe, but with which later we shall need to engage to be prepared to meet whatever is present); visions painted mistily and clouded requiring de-mystifying (i.e. typically consequences of what we observe for which we need to plan i.e. library spaces into information / learning 'commons'); detailing incomplete requiring in-filling (i.e. much of the picture – figures, buildings and constructions, countryside, details of the landscape's background etc (for example current E.U. negotiations on copyright) ; the placement / positioning of observers resulting in differing perspectives and observations i.e. standing solidly in front to obtain the clearest picture and not lurking at the rear to provide excuses of 'not seeing' and so for inaction.

Current 'Landscape':

What are the elements that make up the current 'landscape'? They are clearly the elements of a 'revolution'. (Recall that it is one that had been foreseen thirty years earlier when Marshall McLuhan [1911-1980] gave voice to his 'the medium is the message' [and suggested 'that new technologies exert a gravitational effect on cognition, which, in turn, affects social organisations' – still not yet fully comprehended but where educational practices provide good examples] and his 'global village' [1961] concepts ['electronic media replaces virtual culture with aural culture' like Wikipedia]).

What are these **elements**? I have identified sixteen.

i. World wide web and 'cloud' storage [the 'keys' to maximizing storage and providing access via the application of mini-instruments like mobiles, tablets etc.],

ii. the 'storage' being data banks and search engines – like Google Books, Maps, Wikipedia, Yahoo, Facebook Graph Search, DuckDuckGo, Wolfram Alpha, YossarianLives!, Startpage ('*Guardian Weekly'* 01.02.13; 29) and similar search engines.

iii. Massive amounts of library-held information [Google Books and catalogues of holdings in Harvard, Michigan, Oxford, Stamford, New York Public Library and now another sixteen – twelve universities and four state or public libraries. These [i. ii. iii.] all contributing to 'information overload'.

iv. 'Open access' recently-agreed new practices [Finch, *Dame* Janet (June 2012) 'Accessibility, sustainability, excellence: how to expand access to research publications. Report of the Working Group on Expanding Access to Published Research Findings'].

v. 'Instruments': hardware – mobiles, smart phones, laptops, tablets, e-readers, portable media players. [Example – in Sri Lanka in 2011 the mobile penetration [mobile connections as a percentage of total population] reached 87.8 % (CBSL 2012) with ownership higher in the 16 to 35 age group (Saheed. 2011).]

vi. Apps and androids – hundreds of them: between 100 to 200 new apps released every month: upwards of 1,800 android devices available today. [As an experiment a new apps was released free in Japan where, in one week, it received 100,500 hits!!! (bbc.co/uk.bottomline and bbc.com/click)].

vii. 'Social tools' – sms, blogs, wikis, tweets, twitters, Facebook, YouTube, podcasts etc [*see* Appendix].

viii. Enthusiastic and informed young users.

ix. Fast-increasing developments with reducing costs resulting in ever-greater accessibilities. [Witness in India].

x. Changed learning / teaching [educational] practices and exploitive new curricula versus 'traditions' representing a generational 'gap' between youngsters learning and teachers' teaching traditions.

xi. Similar generational 'gaps' between library staffs and users – inside and outside library buildings.

xii. Reduced resources for LIS provision and services.

xiii. 'Traditional' library services, practices and management priorities.

xiv. 'Inherited' library buildings now inhibiting changes and future needs for 'spaces'.

xv. 'Creations' so innovative that they defy traditional classification and consequently 'organisation [i.e. Will Self (2012) '*Kafka's Wound'* or Ware, Chris. (2012) *Building Stories*;].

xvi.   'Information overload'.

II.   **Gaps**:

Paint these elements, if you will, into the new revolution 'landscape'. What is revealed to us as viewers? A picture that might well be labeled 'Text to Techno' with 'gaps' between the 'elements' [as above] that by tradition we, in LIS, recognize and are familiar with but this same 'landscape' viewed, not by us but by the Users, that presents to them radically different viewpoints. It might be categorized as a revolutionary landscape viewed from its past [long past] to the present – i.e. the majority of LIS professionals – but also viewed from the present and on into the future – the 'revolutionary' view of young information Users.

What is disturbing is that this 'gap' between 'elements' is precisely the point of inter-section - from the perception of LIS 'traditionalists' – where the space in which the point of delivery of information services to Users in the past took place, with, now, the new radical 'open world of information'. They have converged. In other words the LIS profession's convergence space today has opened up into a 'gap'. Gaps need to be filled. The question is: who is going to fill them? With what?

So what does constitute these 'gaps' between 'what' - on one hand – and the 'what' on the other? The answer, in the context of the current 'landscape' and this present revolution – over-simplified, is that the prime and major 'gap' is between information in all its quantities [if not its qualities] and the Users [with their multifarious new 'tools' with which to access information.] In other words the 'gap' is the 'convergence space' traditionally inhabited by Librarians and Information Scientists between users and their information requirements and we, the Librarians, who attempt to meet these requirements. Today, however, the 'landscape' of that 'gap' or convergence space has enormously changed. Previously the gap existed in a narrow circumscribed picture focused on the library and / or the institution of which it was a part, its traditional resources and, in the main, somewhat conservative services. Today these remain in the picture but this narrow 'library landscape' picture has been complemented, indeed supplemented, by 'broad vistas' of information with-out that library space and with the viewer's focus moving off from the library to be diminished or diminishing.

What now occupy the 'gaps' related to our LIS 'convergence space'? Let us examine them *seriatim*:

i.   World wide web and 'cloud' storage   } – *previously information storage was the LIS domain where it   was held on our shelves in our stacks in the library building. Today that scene represents only a part of the 'picture' and no longer the central part!*

ii.   Data banks and search engines   }

iii.   Library-held information   }

iv.   'open access'   - *requiring [possibly by legislation] new practices and relationships with creators,   publishers, suppliers and Users.*

v.   'instruments' / hardware   } – *previously we had complete control of the 'instruments' – issue desks & light pens, catalogues, shelf order etc*

vi.   Apps and androids   } - *failures represented by lack of comprehension of the benefits and disadvantages of the usage of 'social tools' – the 'gap' represented by opportunities available but being lost*

vii.   'social tools'   **-** *the 'gap' represented by lack of understanding how to use and   exploit them.*

viii.   Young users   - *with expert abilities versus inabilities of 'elders' to exploit.*

ix.   Fast developments and reducing costs *- a situation ever with us*
x.   Changed learning / teaching [educational] practices and exploitive new curricula versus 'tradition'   *- thus allowing students to get ahead of, and become more competent users, than their teachers – hence the 'gap'.*
xi.   Generational 'gap' between learners and teachers *- Benefits - especially for student-learners from teacher / learning innovations –but the 'gap' being the inability of teachers to seize these opportunities to innovate*

xii.   Generational 'gap' within and without library spaces and between users and librarians *- Generational differences in attitudes between users and non-users [mis-understanders!!] in two situations [or 'landscapes'] – inside the Library and, more importantly, the 'landscape' outside + the gap' exacerbated by lack of advisors to assist users through the multitude of information choices*
xiii.   Reduced resources for LIS provision and services *– the always-present 'gap' between what is needed and what is available!*
xiv.   'Traditional' library services, practices and management priorities *– the 'gap' being past and 'traditional' librarians versus the new 'Cybrarians'.*
xv.   'Inherited Library buildings now inhibiting changes and future needs *– i.e. for 'spaces' such as 'information' and / or 'learning' commons*
xvi.   'Creations' [i.e. Will Self '*Kafka's Wound*'] *-so innovative that they defy traditional classification and consequently 'organisation and abilities to retrieve.*
xvii. 'Information Overload' where 'quantity' overpowers 'quality' resulting in ever-increasing needs to sort the 'wheat' from the 'chaff' with the advice of qualified professionals assisting the User. *The 'gap' here represented by the abilities of the professional, or their inabilities, to assist.*

To summarise: Crudely, and possibly over-simply: information is everywhere [and 'information' is the life-blood of librarianship and information science] with information [of all types in all formats – book-based, journal-contained, family-generated, commercial-products, socially-engineered, emotionally-motivated, educationally-services] accessible at the press of a button [or two] across all Continents, on the lands, on the seas, in the air all contributing to [in LIS terminology] 'information over-load' for Users.

Comments:

Let us comment on a selection of these important 'gaps' *seriatim*:

vii. Social tools' availability the 'gap' represented by lack of understanding how to use and exploit them:

The 'gap' here is between confident 'exploiters' and timid 'non-exploiters'. It is generational – witness young people's innovative explorations of what possibilities the tools provide and their use of them and adults' reservations about them. For instance, in the UK, more than seven million adults have never accessed a www site. (bbc.news/click)

xii. Generational differences in attitudes between users and non-users in two situations [or 'landscapes'] – inside the Library and, more importantly, the 'landscape' outside.

Inside the library - research undertaken in the Faculty of Graduate Studies, University of Colombo [Sri Lanka] has revealed these generational 'gaps' based on the following descriptions of four age groups: the 'Silent Generation' or 'Traditionalists' - born between 1927 and 1945; 'Baby Boomers' -

born between 1946 and 1965; 'Generation X' - between 1965 and 1982; 'Generation Y' or better 'Net Generation' - between 1982 and 1991. Each generation has been found [Lippincot (2005), Oblinger (2004), Oblinger and Oblinger (2005), Prensky (2001), Tapscott(1998)] to possess certain very individual characteristics. 'Baby Boomers' have been found to be workaholics, independent, goal-oriented and competitive; 'Generation X' individualistic, technologically adept, flexible, value work / life balance; 'Generation Y' – tech savvy, family-oriented, achievement oriented; team-oriented, attention craving. In addition the latest and current 'Net Generation' is digitally and visually literate, multi-tasking connected, wanting immediate responses – now! experiential learners, visual and kinesthetic, not requiring to consult manuals. Their information-seeking behavior reveals that 'only 2% of under-graduates commence their search at library web-sites – 89% start with the web, 95% believed web searching to be faster, 84% more convenient and 87% thought these easier to use than the library web' (OCLC. 2006) [although whether it is 'quality' information that they receive is doubtful!].

Observations and general comments have suggested that few library staffs are 'Net Generation' because of the periods early in their careers required for LIS education, finding a job and getting a foot on the career ladder all of which mitigate against such a situation with the result that the majority are Generation X [born between 1965 and 1982]: in the main those in decision-making senior positions will be Baby Boomers [1946 to 1965] whilst a handful of librarians in really senior positions capable of national influences may well be even of the 'Silent Generation' that is in their 60s or even 70's. The significance is to mark the differences in the characteristics between these generations in order to understand the seriousness of the LIS situation and the urgency with which it needs to be resolved.

The 'gap' between library resources and services provisions perceived by 'Net generation' of users now with us has clearly indicated to Dr Wijetunga [Librarian, University of Peradeniya] the facts that in libraries they perceive that catalogues contain only library-owned materials; library web pages provide only a digital guide to the physical layout that identifies fragmented physical conditions; they provide no instant access to their information needs; library's web pages are highly textual. Nowhere do libraries suggest collaborative learning but instead are perceived as being not user-friendly giving the impression that all these have been long brought into existence by 'Baby Boomers' or 'Generation X'ers   to respond to the needs then of their times – now, for the 'Net Generation', those are in the past.

Essentially what the research indicates is that the major 'gap' in libraries exists not between the 'X' and 'Y' generations but between the 'digital generation' and the library's staff some of whom were found to be members of the 'Silent' generation [born between 1927 and 1945] and the majority 'Baby Boomers' [1946 to 1965] and 'Generation X' [between 1965 and 1982]. It is not a surprising finding: it is, however, most worrying.

The message from Dr Wijetunga's survey is simple. When set against the competencies of young 'Net Gen's obtaining their information needs from outside the library via the Internet, social tools and smart phones and tablets, in comparison, the majority of libraries' and their staffs cannot compete. They are out-aged and out-classed. Solutions are either (i) to speedily and massively embark on libraries training staffs to compete with - or better - to out-smart these disenchanted potential young Users. But to remedy such situations would require large training programmes too expensive for budgets to currently bear. The second alternative would be for library staffs competent enough to step into the 'gap' created by information overload and assist Users to obtain reliable and quality information from their sources to meet their needs. That move would be in line with 'information

scientists' skills and competencies and would turn the 'gap' into a useful 'convergence space' correctly occupied by librarians and information scientists with skills that Users will require indicating that they deserve to be there! The remaining staffs could be left to continue, as has been well-established traditions, to manage their collections of books, journals other media, buildings and staffs!

Of equal concern, perceived by 'Net Generation' users between outside the library and within it, are more differences even more pronounced.

Outside the Library - A relevant and fascinating study [as yet uncompleted – Connaway and Mood (2012)] is attempting to 'identify engagement and technology and information' from amongst four hundred 'information seekers' in the US and UK. It makes clear the large differences that also exist without the library's buildings in the 'wider world' and best illustrated by the following key research questions:

- 'What are the most significant factors for novice and experienced researchers choosing their modes of engagement with the information environment?'
- 'Do individuals develop personal engagement strategies which evolve over time and for specific needs and goals, or are the educational contexts ... the primary influence on their engagement strategies?'
- 'Are modes of engagement shifting over the course of time, influenced by emergent web culture and the availability of 'new' ways to engage, or are the underlying trends and motivations relatively static within particular educational stages?'

Two user groups have been identified in this research by their modes of behaviour as 'Visitors' [viewing the web as 'an untidy garden tool shed'] and 'Residents' [who view 'the web as place (park, building) where clusters of friends and colleagues meet' and 'live out a proportion of their life on-line'] with a 'distinction between online and offline increasingly blurred'.

The research has so far suggested that 'Visitors' have a 'functional use of technology, often linked to formal need (such as use of software for specific coursework, or organizing meetings through email; less visible / more passive online presence, more likely to favour face-to-face interactions; fewer than 6 hours spent online a week'. The 'Residents', on the other hand, and in marked contrast, have 'significant online presence and usage; high levels of collaborative activity online; high dependence on a mobile device (smart phone, laptop, etc); more than 10 hours a week spent online.' The research is, to-date, neither complete nor yet fully published but my guess is that the differences or the 'gap' in the next future generation of Users between 'Residents' and 'Visitors' will have significantly reduced.

xi. Benefits - especially for student-learners from teacher / learning innovations – the 'gap' being the reluctance or inability of teachers to seize opportunities to innovate

(i) Educational practices vary to large extents everywhere but considerably in some Asian and African countries. In some of them 'chalk and talk' still prevails to a large extent or teachers' lecture notes with examinations based on their contents. However there are some that are innovative. I highlight four by way of example.
Those that have innovated employ student-led and teacher-based 'project'-based learning techniques:

   (a) But yet others i.e. in the US and Australia are into 'Challenge-based Learning' [CBL] started as a US experiment by Apple in the US in 2009 and described as ' a structured model for course content with a foundation in earlier strategies, such

as collaborative problem-based learning' and '. .. in addition CBL encourages the use of web and mobile technologies'. [www.net.educause.edu/ir/library/ and www.hmc.com Accessed 22. 05. 13]

(b) Another is 'Inter-active Group Learning' 'Ten ways that mobile learning will revolutionize education' see www.fastcodesign.com Accessed 22. 05. 13].

(c) 'Access - 'Spin' [Net's software] 'Lets you re-mix & interact with content from Harvard, Stanford & Nat Geographic channel' and '21st century 'information fluency' = a model like Lanka's 'Empowering 8' but up-dated.

(d) Professional development for teachers 'Eduwebinair – a virtual professional learning network' www.eduwebinair.co.au Accessed 22. 05. 13. [With thanks for these to Karen Bonanno - kbonanno@bigpond.net.au]

xvi. 'Creations' and innovation

(i) One example is Will Self (2012) '*Kafka's Wound: a digital essay by Will Self*'. *London Review of Books.* Brunel University. (www.thespace.lrb.co.uk Accessed 1. 05. 13) "The LRB wanted to create a digital literary work that pushed the boundaries of the literary essay well beyond its traditional form: using digital technology to loosen and enhance the structure of the essay, changing the way the reader interacts with the text." Another example 'isn't a book at all. It's a cardboard box, about the size of a board game, covered in bright, blocky illustrations and stuffed with comics … The rest are paper: some the size of *Beano*, some as big as old broadsheets … Others mere slivers. There's even a comic book that works like a board game.' (Ware, Chris. '*Building Stories*' – *LRB*. 6 Dec '12. Nick Richardson). More outrageously is an 18th century second-hand book its pages folded and / or cut up with portions blacked out and additions and illustrations added to the old text in manuscript! Is it a new work; what genre is it to be classified in? Works today can now be so innovative that they defy traditional classification and consequently organisation for easy access and retrieval in the Library.

xiv. Information overload on one hand and abilities to 'sort the wheat' from the information 'chaff'.

(i) This is scarcely new having been traditionally a practice for Librarians assisting the User especially those applying 'information science'-type knowledge and skills in the just-identified convergence space we all inhabit. These [ignoring for the moment the 'laws' that categorized information science as a 'science'] tended to test for – comprehensiveness, reliability of source, up-to-dateness, slant or bias, restrictions on usage [i.e. copyright], etc. [An extremely relevant and most useful example fortuitously appeared from the publishers Sage who have engaged the Centre for Information and Communication Studies of the University of Tennessee to undertake a research study on 'The Trustworthiness of Scholarly Research Sources'. Its questionnaire addresses many of the questions that a well-educated information scientist should be asking when assisting Users. (www.cics.cci.utk.edu/cicsprojects/Sloan Accessed 30. 05. 13)]

(ii) As what, formerly, had been recognised as 'user education' skills have transmogrified into the more recent and much more comprehensible and precise knowledge required for information literacy practices and services the theories that had originally emanated from Zurkovsky [1974] and Eisenger's and Berkowitz's [1988] models and subsequent later definitions i.e. SCONUL's 'Seven Pillars of Information Literacy'

[1999], the Prague Declaration [2003], and IFLA's 'Alexandria Proclamation' [2005] now suggest that the time has arrived for these to be critically examined in the light of the new <u>www</u> and 'social tools' environments for similar, but now much more sophisticated, up-to-dateness, relevance, depths, penetration, exactitude etc of each of the 'steps' or stages or 'elements' that constitute them. As a local example take Sri Lanka's 2004 *Empowering 8'* model defining eight 'steps' for actions such as '*Identify*' – define the topic / subject: identify the key words: plan a search strategy: identify different types of resources where information may be found; '*Explore*' – locate resources appropriate to the chosen topic: find information appropriate to the chosen topic; '*Select*' – choose relevant information: determine which sources are too easy, to hard or just right: record relevant information through note making: collect appropriate citations; '*Organise*' – sort the information: distinguish between fact, opinion and fiction; check for bias; use visual organizers to compare or contrast information'; '*Create*' – finalize the bibliographic format; '*Present'*; '*Assess*'; '*Apply*' - in this new landscape they seem too incomplete and 'shallow' today, nine years since their conception, so that each now requires to be individually tested and revised as required.

xvi. LIS knowledge, skills & competencies 'traditionally' practiced and 'innovations'. *[These represent of all the 'gaps', for the LIS Profession, the most significant.]*

'L I S' interpreted in what manner? As 'Library and Information Sciences' or 'Librarianship and 'Information Science': which is correct? A recent (2010) Cilip Report in the UK concerned to define 'our Professional Future' and in doing so 'identify the likely trajectory of the knowledge and information domain' suggests that 'in terms of nomenclature there are mixed opinions regarding the term 'librarian'." This is not merely a semantic consideration: it goes to the heart of one of the major problems facing the LIS profession today where institutions continue to debate the benefits [or otherwise] of the removal of the 'L' word – 'Library'. The word itself is less important than its connotation for the public generally and our Users particularly.

'Science' in the dictionary is 'systematic and formulated knowledge' or '… organized body of the knowledge that has been accumulated on a subject' – both easily acceptable with regard to the subject of 'information' but in relation to 'librarianship' [defined as 'custodian of library hence ˷ship (1) n.' then leaving much open to doubt. However if we accept that science defines itself by reference to relatively immutable laws then we get 'body of enacted or customary rules recognized by a community as binding …. Binding injunctions … rule of action or procedure … correct statement of invariable sequence between specified conditions and specified phenomena'. In other words not 'library science' because a science it is not but instead 'librarianship'. On the other hand Bradford's 'Law of Scattering' [1934], related later to it with Garfield's 'comprehensive index of how scientific thinking propagates' itself via his citations' discoveries (www.en.wikipedia.org/wiki/Bradford'sLaw Accessed 29. 05. 13), the works of Coblans and Karen Spärk Jones' in Cambridge on natural language processing and information retrieval [1972] (www.en.wikipedia/Karen_Spark_Jones Accessed 29. 05. 13) etc indicate in information the existence of laws [conforming to the dictionary definition] so that we can legitimately speak of 'information' as a 'science'.

If not a science what then is librarianship? It has been much defined and attempts - never all of them agreeable and acceptable to all – have been made. A fable exists about a debate on the theory of the numbers of teeth in a horse's head. To resolve the disagreement the Buddha suggested that a horse be brought and the number of its teeth be viewed and counted. Similarly should we view work in librarianship: not 'theorized' but examined. Simply enumerated it is: organization and description of

materials [in which information is contained - 'information containers' (Gray)] - that is cataloguing and classification of these materials and their contents; collection selection, acquisition, preservation, ordering and presentation; the 'tools' or equipment necessary to make the information held in whatever format available from shelving to issue desk procedures; administration of necessary staffs; up-keep and maintenance of the buildings; resources allocation and management; human relationships – staffs and users – what Gray observes are the 'classic facets of the profession's identity'. However in the end all of these suggesting that 'there are too many differing sectors' (Gray) which result in ours being a 'fragmented profession' with no easily recognizable coherence.

Any further attempt in a short paper to an agreed definition of what is 'The Library and Information Science Profession' is besieged with problems founded on philosophical disagreements in which I will not here be involved. Suffice it to broadly outline mine simply as: 'a profession concerned with the provision of information to societies of users resourced from any sources'. It is in the 'translation' of these into practices in terms of resources' and services' provisions where the bedevilment arises. (Gray, Sara Wingate. *IFLA Jnl*: 2012).

[Misunderstandings of my position must not here be permitted to intrude.] Although not the oldest 'profession' it is one of them - from Callimachus of Cyrene [Librarian of the Library of Alexandria between 260 and 240 B.C.] to the present. Its practitioners have been amongst the famed in learning, philosophy and research as have the collections that they maintained. Our skills and competencies have assisted in producing scholars recognized for the excellence of their works – for instance in bibliography, and, more recently, in information science. As a profession we successfully moved from the management of papyrus and scrolls to paper and books, from inscribing on leaves to print on paper via moveable type: past technological advances, out-with our control, have never phased us – we have, in the end, coped with them. Today, facing similar, perhaps even greater challenges, again of new and radical technological advances, what should the LIS profession do? [That is the prime concern of this paper.]

Unlike in the long-gone past today, as librarians and information managers, we are organized and recognised world-over as a 'profession' in other words a recognized body of people held together in an organisation by a recognizable, and recognised, body of knowledge and sets of skills and competencies – just as with any other similarly categorized 'profession'. That is one major difference from the picture of the last mid-fifteenth century revolution and now. Another is that the body of knowledge unique to our profession [some listed above] is now codified, more widely recognized and better understood. It indicates, as with most ancient and well-recognised professions, a broad swathe of subjects in which professionals should be familiar and versed. Today, however, ours is too broad - so much so, as unlike the human body, it is not easy to identify and to hold onto any 'spine' that supports it. Sara Gray's article correctly, if somewhat over-simplistically, observes "this dynamic tension or *Spannung*, is arguably always at the core of the professional service of the librarian, caught, on the one hand, between servicing the usage needs of the individual user, and on the other, the needs of the collection." An observation that is as correct as it is relevant today. The problem therefore is how in practice, in education, in training to embrace them all – especially when some are almost diametrically opposed with little in common between them as when information came out of artifacts like books, journals, a-v materials etc but not out of the ether via 'clouds', 'tools' and 'instruments'.

The differences now are too wide and too great to be held together as in Gray's '*spannung*' - an opinion brought home to me in the early 1990's when, in The Library Association, we were consulting nationally to prepare NVQs [National Vocational Qualifications] for Levels I to IV for libraries, information centres and archives]. Something now has to give. W.B. Yeats (1919 – 'The

second coming') and Chinua Achebe (1958) observed 'Things fall apart: the centre cannot hold'!
Thus it is today. But read on 'Mere anarchy is loosed upon the world. / The blood-dimmed tide is
loosed, and everywhere, / The ceremony of innocence is drowned: / The best lack all conviction,
while the worst / Are full of passionate intensity." As proof witness the LIS literatures in all countries,
observe the arguments for the protection and selection of reduced services [in the West], assess the
full-to-bursting LIS educational curricula and programmes, observe the many-branched structured
organisations of professional associations, examine specialisms for features rarely common to both.
The 'centres' / 'cores' / spine are difficult to identify and when clarified share few common attributes.
The time has come to examine the ungainly beast that has morphed and divide it into its respective
pieces the better to understand each of them and manage them especially in this new radical landscape
made up of generational and other 'gaps'.

Just where should that divide naturally occur recalling that the priority 'gap' [see above 'LIS
Knowledge, skills & competencies 'traditionally' practiced and innovations'] coincides with our
professional 'convergence zone' consequently it is not difficult to identify in terms of the largeness
and spread of knowledge and skills and more importantly those best placed and necessary to respond
to today's Users' needs. This 'gap' might be best categorized as 'traditional' versus 'newer'
knowledge and skills, management of artifacts and services founded on them, 'texts [books'] versus
'techno [information']! The division thus naturally falls between 'traditional librarianship' concerned,
in the main, with sets of techniques' (Buckland 2010) and information science-based laws and
knowledge about which he correctly observes 'there are distinctions to be made between, for example,
techniques and applications relating to 'information science' versus 'librarianship' – an opinion
earlier supported by Osburn (2009) who perspicaciously observed that 'librarianship has allowed, or
perhaps caused, the purpose of … technology to be overshadowed by the mechanics of …
technology' (126) which exactly follows Mukherjjee's questioning 50 years earlier whether "the drift
towards the preponderance of technicalities, [is] a portent, of the superstructure of librarianship being
regarded as more important than the ends to be served." (Mukherjee. 1966:3) When this new
information emerges from the ether, from 'cloud' storage and via www and other internet interfaces
then 'cyber' ['cybernetics' being the "study of system of control and communications in animals and
electrically operated devices"] seems an appropriate word to highjack to create 'Cy-brarians'. It
certainly would be in conformity with Paul Otlet's (1934?) and later Jesse Shera's (1973) approach to
librarians' competencies 'in terms of the importance of the transmission modes in the process of
informing'.

 The 'traditional' librarianship side of the 'divide' or 'convergence zone' would reflect techniques,
skills and competencies necessary to manage the library ['librarianship'] and its contents the other
side concerned to supply to Users expertly-assessed quality information from out of cyber-space by
'Cybrarians' employing up-dated, enhanced information science knowledge and skills. These would
be in conformity with the 'concept of 'use' or 'utility' intrinsically at the core of definitions of
librarianship' (Gray). [The choice of word still indicating the umbilical relationships that will, of
necessity, continue to exist in the profession in which Donald Urquhart perceived that 'librarianship
is concerned with the flow of information to individuals' (Urquhart. 1981: 56)] But, hopefully,
'Cybrarianship' beginning to become associated with innovations in quality information provision in
what Gray perceptively and embarrassingly identifies as 'this new world of mobility – of digital
services, connectivity, and people themselves.' (43)

III. CHALLENGES:

The significances of these 'gaps', for Librarians and Information Scientists, is that they represent 'challenges'. But all challenges can, and should be, converted into opportunities.

The primary 'challenge' is to discover an answer to the question: What does the library profession need to do to occupy [re-occupy??] central roles in the information situations that in the future are going to be pre-eminent?

We have already examined what today constitutes libraries and services to discover they include management, organization and administration of resources – finances, materials [books to buildings] and humans [knowledgeable & competently-trained staffs]; ordering for access and use the resources [classification] describing them to make them available [cataloguing]; managing both [applying systems & programs]; supporting administrations; management skills and competencies for them all; customers' / Users' relationship skills; marketing; political acumen; knowledge of User communities. Concentrate for a moment on user-needs – because out of this collection of skills and competencies Users are concerned for one thing only – satisfaction of their needs – the remainder to them is perceived as internal libraries' 'house-keeping' only. Their 'needs' are met – through whatever formats or presentations – from 'information'. It is knowledge of information and the laws that have been formulated to explain its creation, its movement, its values that consequently represent for the Users the 'core' or 'spine' of the LIS profession.

But as we have attempted to prove it is here wherein resides the 'gap' – the 'gap' which we have categorized as the 'convergence space' that the LIS profession has habitually occupied. It is here, as a consequence, where today's changes will most radically need to take place. Not in management of buildings or systems or marketing – as examples! It is this 'area' of the LIS profession's 'landscape' that the exciting and intellectually-stimulating developments brought about by the 'revolution' of apps, androids, social tools, instrument-developments, price-reductions, etc will take place. Of course developments in the other - what I have labeled 'traditional' - areas of LIS will take place but in comparison these will fail with their publics and users to carry the kudos of those that will occur from the information-provision services.

Examine if we will, in greater detail, these two 'landscapes' painted above to discover the great contrasts between them. The 'traditional' employs, and will continue to employ, skills and techniques to manage resources and collections and from them service-provisions. They will all be library-based [examine LIS curricula in teaching institutions to best comprehend them]. However it is in the information provision areas where LIS professional's expertise will need to grow and develop. 'Librarianship' *per se* possesses too little of these. Consequently it will be apparent one 'landscape' is concerned with techniques and skills many traditionally handed down: the other with 'products' of the laws of information science.

IV. Consequences:

From such upheavals, of course, can be expected many consequences. Selected here are a small number focusing on those that apparently hold major consequences for Librarians, Information Scientists and the LIS profession.

What do these suggest? Two major responses. [1]. For many currently-practicing Librarians their present knowledge levels and competencies and skill bases [affected by the generation from which they come] have already become inadequate to work with confidence in the 'gap' now opened up

between 'text and 'techno' both of which are associated with our professional convergence space - thus between quality information services provided and Users' sophisticated new needs. [2]. Education for L.I.S. – particularly the I.S. in this new 'landcape' - has to be radically overhauled to respond to these new Challenges [*pace* the Sage / University of Tennessee survey]. Without educational innovations to motivate and to drive change never will it come about!

It might help, in order to view these pictures with greater clarity, by placing them, as in an art gallery, in an historical context recalling earlier pictures with which - I hold - the present one contains too many similar reflections.

Reflect on the nineteen twenties and thirties [and the professional literatures of these periods]. They illustrate the then immense dissatisfaction from industrial and commercial organizations with the knowledge and skills that librarians were allegedly failing to bring to satisfy these companies' information requirements. Among the first consequences were - in the UK - the creation of ASLIB [now the Association for Information Management but when established the Association of Special Librarians and Information Bureaux] in 1924. Followed then by the frustrations of Jason Farradane [1906-1989] who, as early as 1948, developed the concept of 'information science' in a paper delivered in the UK to the Royal Society's Scientific Information Conference. Ten years later there emerged, in 1958, the Institute of Information Scientists as the result of dissatisfaction with the priorities of The Library Association [1877], Aslib [1924] and SCONUL [1950 - the Standing Conference of National and University Libraries - now the 'Society of College, National and University Libraries']. In the US a similar picture presents itself with the establishment of the American Society for Information Science [ASIS] which owed similar origins to the American Documentation Institute founded in 1937. These to be later followed with the creation in 1961 of science citation indexing by Eugene Garfield in his Institute for Scientific Information. Not immune from these scenes were the international pictures in the 1960's and early 70's both witnessing fierce arguments over Unesco's transformation of its work when, with the International Council of Scientific Unions [ICSU], it established in 1967, its 'General Information Programme' [PGI] [now known as the 'Information for All Programme' [IFAP in 1999]. These all viewed then almost as a 'war' between 'traditional' librarians – best represented by the competencies required then for the public library scene – and in contrast the information scientist snuggling up to research, industries and commercial concerns who claimed [with some correctness] that their specialist information requirements were being ignored by the so-called 'mainstream' of 'librarianship'.

Against these 'landscapes' can one not observe almost a similar repeat in the 2010's of the 'gaps' that occurred in the mid-1900s?

My personal opinion contains no doubt that the future, working with huge quantities of information – some of doubtful integrity – and assisting the User to find his or her way through it all to select the most appropriate to the tasks before them, will provide the most exciting intellectual stimuli for future library and information work.

However another major challenge [of little if any interest to Users] presents itself. It will be concerned to hold together the two parts of what will be a divided profession. One side ['techno'] will be professionally involved with information provision employing knowledge of the laws of information science - as 'Cybrarians' - in the services of relatively sophisticated users. On the other – Librarians - will continue, much as before with 'text'-based services thus employing their skills and competencies to traditionally manage the technicalities of libraries and their collections.

Summary: The picture of a unified 'landscape' of the library and information science profession is not destroyed. Indeed the picture has to be preserved but with changes in its structure. In that landscape, and still recognizable, will be the centre or 'core' of the LIS profession – bibliographical knowledge, books' and journals' organisation and information management and their dissemination skills. These not only remain to provide a unity to the picture by holding together the elements that make up that landscape they also serve to supply the recognised and unique features that so importantly distinguish librarianship and information science from any other professions. The figuration of the landscape has changed: that is all. Standing outside the frame the picture presented to the viewer - the User - will be a foreground now occupied by those with information quality assessment skills [employed on behalf of the 'viewer' or User] - those we have labeled 'Cybrarians'. Into the background and middle-distance have moved those with the 'traditional' technical skills needed to manage the library and its collections who can be identified as professional technicians practicing Librarianship. Thus the 'landscape' will still remain the 'pretty picture' that it nearly always has been!!!

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