

# Information Resource Development and “Collection” in the Digital Age: Conceptual Frameworks and New Definitions for the Network World<sup>1</sup>

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*This paper describes some of the challenges in defining the terms “collection” and “collection development and management” in the digital age. It uses a four-phase framework to explore the impact of information technology on library collections over the last half-century. It also draws on current doctoral research to explore definitions of “collection” from a wide range of stakeholder perspectives. The paper argues for the continuing importance of libraries’ core functions of collection development and collection management, and of the value of the term “collection”. It also advocates a collaborative network-based approach to developing and managing globally accessible collections in the digital world.*

## Introduction

The proliferation of web-based documents, innovations in library management systems, new licensing and subscription models, open access publishing, and other recent developments have challenged traditional ideas of “collection” and contributed to new conceptual models, such as the concentric-circle and layered conceptions suggested by Gorman (2000, 2003) and Lee (2000, 2003). Alternative terms for collection-related activities in the digital age have been suggested, including “information resource management” (Savic, 1992) and “content management” (Budd & Harlow, 1997). However, the increasingly dynamic, user-generated nature of much digital content, combined with the convergence and diversification of the roles of information publishers, suppliers, consumers and libraries, suggests a renewed significance for the traditional collection development roles of selection and evaluation. In this paper we draw on recently published work (Corral, 2012) and current doctoral research to explore the concept of collection

development and definitions of “collection” for libraries in the digital age.

We use a four-phase framework described by Corral (2012) to review the impact of developments in information and communication technologies on strategies, tactics and operational processes for collection development since the late 1960s, culminating in the emphasis on transformation, collaboration and network-based collections seen since the start of the 21st century. We then draw on ongoing doctoral research conducted in partnership with The British Library, which explores the concept of the library collection in the digital world. The project focuses on the emerging interdisciplinary field of social enterprise (business with a social purpose) and aims to address the research question: “What constitutes the concept of the library collection in the digital world?” Supported by our initial findings, we argue for the continuing value of the term “collection” as a way of describing the process of bringing together and making accessible materials in all formats in a structured way.

## Defining the collection, and collection development and management

Before the latter part of the twentieth century, core library processes relating to the collection tended to be described at a narrower level, such as “book selection” (McColvin, 1925), or encompassed in wider terms, such as “library administration” (Ranganathan, 1959). The widespread use of the term collection development as a way of describing a key area of professional library practice can be traced to the 1960s and 1970s, exemplified by the launch of specialist journals such as *Collection Management* (1976) and *Collection Building* (1978) (Broadus, 1991; Johnson, 2004; Kohl, 2003). Much debate has surrounded the relative use and meanings of the terms

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“collection development” and “collection management”; some writers clearly distinguish between the terms (Atkinson, 1998), some use the terms more or less synonymously, whilst others like Johnson (2004, p.2) use the terms “in tandem”. However, within a chosen terminology of collection management or collection development, a hierarchy of management levels from the strategic, to the tactical, to the operational is described. Table 1 summarizes these ideas, suggested initially by Edelman (1979) and Gorman and Howes (1989), and described in greater detail in Corral (2012).

Table 1. Collection development hierarchy (Corral, 2012, p.5).

Collection process	Relevant question	Management level
Collection development	Why?	Strategy
Selection	What?	Tactics
Acquisition	How?	Operations

### The impact of information and communication technologies

Developments in the field of information and communication technology since the 1960s have had a dramatic impact on library collection development and management at every level. Lynch (2000) charted the shift in library use of technology since the 1960s, describing an initial period of modernization, driven by automation of routine library processes, followed by innovation and experimentation – particularly in user access to electronic information and finally a stage of transformation represented by digitization and greater access to born-digital content. Corral (2012) expands on the framework proposed by Lynch (2000), elaborating four major phases in the development of digital technologies and their corresponding effects on collection development. Table 2 summarizes these phases, which we describe briefly in this section; for a more detailed description of each phase see Corral (2012, pp.7-14).

#### *Modernization – computer-based operations*

In this framework, modernization is characterized by the use of computers in routine library operations, both within individual libraries – improving the efficiency of local circulation and cataloguing – and to facilitate co-operative approaches to library processes, including through the distribution of machine readable bibliographic data by the Library of Congress and in the activities of the newly-formed OCLC (Trochim, 1982). Computer-output microform (COM) began to replace card catalogues, highlighting the importance of microfilm for libraries, both

as a suitable format for newly published specialist materials and as a useful means of preserving existing embrittled print publications from the nineteenth century (Kohl, 2003). This period also saw an increasing focus on resource sharing and other approaches to developing collections which looked beyond selection for local holdings (Johnson, 2004; Kohl, 2003).

At the same time, pressure on space in academic research libraries led to fresh approaches to evaluating and withdrawing library materials – in the United Kingdom this gave rise to the concept of the “self-renewing library” as proposed in the Atkinson report (University Grants Committee, 1976), whereby new acquisitions would be balanced by equivalent levels of withdrawals. This concept proved highly controversial and was debated in key texts such as Gore (1976) and Steele (1978).

Table 2. The impact of digital technology on collection development (Corral, 2012, p.8)

Date	Digital technology developments	Collection development issues
late 1960s–1970s	Modernization: automation, computer-based operations	library housekeeping, bibliographic utilities, COM catalogues, retrospective conversion, microform masters, self-renewing/no-growth library
1980s–early 1990s	Innovation: experimentation, computer-based services	library management, Conspectus methodology, OPACs, access versus holdings/ownership, end-user searching, just-in-time information
late 1980s–1990s	Transition: digitization, computer-based content	integrated systems, licensing consortia, full-text databases, multimedia products, resource discovery, virtual/digital/hybrid library
2000s–	Transformation: collaboration, network-based collections	ERM systems, federated search, open access, institutional repositories, digital asset management, data curation

#### *Innovation – computer-based services*

This was followed by a period of innovation, catalyzed by the increasing use of the Internet and the greater availability of personal computers during the 1980s and early 1990s. Integrated library management systems combined capabilities for administering a wide range of discrete library functions, from basic circulation to more

sophisticated operations, such as serials management or interlibrary loans, within single systems. Users of networked desktop PCs were able to access online public access catalogues (OPACs) either for local and consortia libraries, or for collections further afield through customized computers with wide area network connections or using local or networked CD-ROMs. At the start of the 1990s, the concept of access to information and knowledge resources, particularly through the provision of interlibrary loan material, began to emerge as a strategic alternative to the ownership of materials (Brin & Cochran, 1994). In the United Kingdom, this was sometimes described as access versus holdings (Baker, 1992; Corral, 1993), although the key issues – rising inflation in purchase prices, pressure on library budgets, and the growing role of technology in facilitating access – remained the same (Baker, 1992; Brin & Cochran, 1994; Corral, 1993). Resource-sharing and collaborative collection development was further supported by the development of the Conspectus methodology by the Research Libraries Group in the USA. This used a scale of 0 (out of scope) to 5 (comprehensive level) to describe the quality of a library's local holdings (Wood, 1996). However, the increasing importance of access-based approaches to the collection and the greater significance of electronic resources led to a perceived lack of relevance of the method, despite attempts to define a new Conspectus model for a digital world (Clayton & Gorman, 2002).

#### *Transition – computer-based content*

During the later part of this period, from the late 1980s, the growing role of computer-based content contributed to a phase of transition during which print-based materials, such as the *Encyclopedia Britannica*, digitized literature collections and journal content began to migrate to CD-ROM and other online or networked digital formats. At the same time, many libraries also began to digitize materials held in their local collections. The aim to combine access to print materials, digitized materials and born-digital materials (in many different formats) was articulated in the term “hybrid library”, as used by Chris Rusbridge, the director of the UK's Electronic Libraries (eLib) program:

“The name hybrid library is intended to reflect the transitional state of the library, which today can be neither fully print nor fully digital” (Rusbridge, 1998).

This period was also characterized by the emergence of the so-called “big deals”, as large amounts of electronic content were aggregated and supplied through licensing arrangements, often negotiated at the level of regional or national consortia (Bley, 1998; Kohl, 2003; Roberts, Kidd, & Irvine, 2004; Walters, Demas, Stewart, & Weintraub, 1998). During this time, alternative terms for collection-related activities in the digital age were suggested, including “information resource management” (Savic,

1992), “knowledge management” (Brinin, 1994) and “content management” (Budd & Harloe, 1997).

#### *Transformation – network-based collections*

Since the start of the new millennium, a trend towards network-based collections has marked an era of transformation in libraries. Large quantities of electronic content have led to the development of electronic resource management systems (ERMS), streamlining processes relating to these resources and facilitating dynamic updating of digital resource lists. In academic libraries, the increasing use of learning management systems (also known as course management systems, instructional management systems and virtual learning environments) has provided opportunities for libraries to facilitate access to course materials and to deliver focused information literacy support (Black, 2008), although these systems have also created new challenges for librarians, with content largely controlled by faculty members, leading to the creation of local collections of resources – often including copyrighted materials – which librarians may lack the necessary permissions to access and manage (Corral & Keates, 2011; MacColl, 2001).

The “open access” movement has also grown during this time, catalyzed by continuing increases in the cost of electronic content. Suber (2003, p. 92) identifies two key features of open access material:

“First, it is free of charge to everyone. Second, the copyright holder has consented in advance to unrestricted reading, downloading, copying, sharing, storing, printing, searching, linking, and crawling.”

This content may be provided by publishers creating open access journals by employing new business models – such as charging authors – or created by non-traditional publishers and specialist organisations, for example the recently launched *eLife* web-based journal, supported by the Howard Hughes Medical Institute, the Max Planck Society and the Wellcome Trust (eLIFE, 2012). It may also be provided by researchers self-archiving a version of each output they produce in institutional or other repositories (Peters, 2002). Repositories in the academic community have widened their reach beyond typical research materials such as papers, journal articles or theses to include management of a wider range of digital assets such as multimedia resources, including images, recordings and data supporting published papers (Hilton, 2003; Joint, 2009; Lynch, 2003). Management of these institutional repositories draws on a range of traditional collection development and management skills, including policy development for material selection (and deselection), metadata creation and control and access management (Connell & Cetwinski, 2010; Genoni, 2004). Management and curation of data within virtual research environments (VREs) draws on similar skills to enable data discovery,

sharing, use and long-term archiving (Hey & Hey, 2006; Voss & Procter, 2009; Walters, 2009).

### **Concepts of the collection in the digital age**

Michael Gorman (2000, pp. 10-11) proposes “a modern definition of the word ‘collection’”, based on access, with four dimensions including: tangible materials owned by a library; intangible materials owned by a library; tangible materials owned by other libraries; and intangible materials not owned by – but accessible through – the local library. Although definitions of “library” and “collection” have been intertwined with concepts of “access” for some time – Young (1983, p. 131) described three dimensions to this, presenting a library’s purpose as being to provide users with “physical, bibliographic and intellectual access” to materials, and later definitions also pick up on the theme (Buckland, 1989), including references to the role of libraries in providing access to materials from other collections (Soper, Osborne, & Zweizig, 1990) – an indication of the greater complexity of the interplay between ownership and access in the digital world is apparent in Gorman’s model. Gorman (2000, p. 11) expresses these concepts as a series of concentric circles and, later, in a revised form as a layered hierarchy where “each level is less organized and harder to gain access to than its predecessor” (Gorman, 2003, p. 459), locating freely available electronic materials at the outer level. Lee (2003) proposes an alternative concentric circles model of the faculty users’ perspective on information collections, beginning with the “immediate space” of personal collections and materials accessible from a computer, and proceeding outwards through local collections, to interlibrary loans and bookstores.

However, these models of the collection, although more sophisticated than earlier definitions, do not capture the full “potential chaos... of the information universe” described by Brophy (2007, pp. 120-121). Buckland (1995) and Demas (1998) both respond to the challenge this presents to collection developers and collection development in the digital world by emphasizing the importance of value-based selection over demand-driven and, in particular, the need for coordinated, strategic approaches to specific selection processes – such as selection for preservation by digitization (Demas, 1998), or wider linking to related content beyond local boundaries (Lynch, 1998).

Dempsey (2003) suggests describing materials using a grid which sets stewardship requirements against their uniqueness. This approach highlights an opportunity for library and information professionals to develop their roles in the stewardship of the resources that are unique to the specific community they serve. Although much of this work takes place at a local level, collaborative projects provide strategic opportunities for library and information professionals to develop integrated globally accessible

collections. Examples of successful collaborative projects focusing on unique content include the recent development of the EThOS (Electronic Theses Online Service) in the UK, which has seen the large scale digitization of theses, many of which are now openly accessible on the web (Russell, 2009).

Another collaborative project – the UK Research Reserve (UKRR) – has signaled a move away from local storage of generic content (printed journals) by facilitating the de-duplication of stock across participating libraries, creating benefits for local library users through significant space savings for individual institutions, whilst guaranteeing long-term preservation of the journal content (Boyle & Brown, 2010). Consortia approaches to e-journal purchasing are not new, but the Scottish Higher Education Digital Library (SHEDL) proposes an innovative model, moving away from big deal purchasing by local institutions, towards the creation of a “common information environment” across all subscribed SHEDL members, with initial results showing both increased e-journal use and lower per use costs (Research Information Network, 2010).

### **Investigating concepts of “collection”**

The concept of the collection in the digital world is currently being explored in a doctoral research project supported by the British Library. The project is focusing on library collections relevant to the emerging field of social enterprise, in which business approaches are used for a social purpose. The research uses a mixed methods approach to gather and synthesize data from a range of sources, including a case study of services and projects at the British Library and search results from a wide range of library catalogues. However, for the purposes of this paper only the initial part of the third strand of data collection – qualitative interviews with stakeholders, exploring their definitions of the collection – will be discussed.

The interviews have taken place as part of an “exploratory sequential” study (Creswell & Plano Clark, 2011, p. 86) where an initial qualitative study (interviews) provides data to identify key issues and is followed by a quantitative element (a questionnaire survey) that aims to generalize findings about perspectives on these key issues to a wider population. The study is intended to contribute to answering the main research question by addressing the following subsidiary questions:

- How is the library collection for social enterprise used?
- How do people interested in social enterprise seek information?
- What are stakeholders’ perceptions of the library collection for social enterprise?

- How do library processes relate to collections for social enterprise?

Semi-structured interviews have previously been used to explore information behaviour (Kuhlthau & Tama, 2001; Lee, 2008; Makri, Blandford, & Cox, 2006) and perceptions of the collection (Lee, 2003, 2005). For this project, two main interview scripts were devised: one for social enterprise practitioners, academics and policymakers working in the field, and one for library and information practitioners. Both scripts included questions about the concept and definition of “collection”. Scripts were revised and customized for individual participants, although each interview included the question “What do you understand the term ‘collection’ to mean?”, which forms the basis of the discussion below. The project was ethically reviewed by the University of Sheffield’s Information School.

Sixteen semi-structured interviews took place between June 2011 and March 2012. Purposive sampling was used to select participants thought to have an interest in social enterprise information. The interviews were transcribed in full and analyzed using the generic coding approach suggested by Saldaña (2009, p. 48) and NVivo qualitative data analysis software. Table 3 summarizes the composition of the sample and shows the identifiers used in recording data. The interviewees included 9 women and 7 men.

Table 3. Interview characteristics

Stakeholder category	Identifier	Participant characteristics
Academic: faculty member or researcher	A1	Faculty member
	A2	Faculty member
Library or information practitioner	L11	Government librarian
	L12	Online information resource manager
	L13	Public librarian
	L14	Academic librarian
	L15	Academic librarian
	L16	National library librarian
Policy maker	PM1	Policymaker
	PM2	Policymaker
Social enterprise practitioner	SE1	Cycle training co-operative
	SE2	Renewable energy project group
	SE3	Social enterprise support director
	SE4	Social enterprise consultancy
	SE5	Community health social enterprise
Other	O1	Research center administrator

## Stakeholder conceptions of “collection”

All interviews included the question “What do you understand the term ‘collection’ to mean?” and the responses of five interviewees suggested that they associated the term with library jargon. This included two library and information practitioners. Two social enterprise practitioners and one policymaker also identified the term with library jargon. However, all these interviewees went on to provide further sophisticated and nuanced definitions of “collection”.

### *Collection as process, store and access*

The conceptual issues raised by interviewees’ definitions of collection seemed to be usefully summarised by one social enterprise practitioner:

“I guess there’s two possible meanings, one is the actual collecting of the information and data, collecting raw data, and then I guess the other sort of collection can mean the storage of the data and I guess another collection would be external information which you’re collecting up so you’ve got access to it – that’s three types!” (SE1)

This quotation suggests “three types” of meaning: collection as process (“actual collecting”), collection as a store or thing (“the storage of the data”), and collection as access (“so you’ve got access to it”). Comments from other interviewees suggested that these three meanings could be used to broadly delineate discussion of the concept of the collection.

### *Collection as process: selection, search and service*

Horava (2010, p. 150) advises “Consider what a collection does rather than what a collection is” and the interviews conducted in this project provided strong support for the idea of viewing collection as process. One comment from SE5 summed up this idea very effectively by suggesting “collection... feels like a journey, doesn’t it?” Other comments relating to the idea of collection as process seemed to fall into three distinct but related categories: selection, search, and service.

### *Collection as process – selection*

A1 defined collection as “a body of work that has been brought together using a particular set of criteria”, in a phrase which echoes both Lagoze and Fielding (1998), “A collection is *logically* defined as a set of criteria for selecting resources from the broader information space”, and Atkinson’s (1996) discussion of the “process of importation”, by which materials may be dynamically brought into a collection from the wider online environment. This also supports suggestions by Dempsey (2003) and Moss (2008) that libraries should support the

creation of users' individual information collections. Current work in the field of linked data (Byrne & Goddard, 2010; Coyle, 2011) may present opportunities for a more dynamic kind of bespoke collection creation, although library implementations of linked data approaches appear to focus on linking data about individuals or cultural artefacts (Bartlett & Hughes, 2011), rather than about less well-defined concepts. This may provide one method of meeting the need, expressed by A2, to surface information about materials which already exist on related topics and which are relevant to emerging fields of current interest, such as social enterprise.

"Selectivity" is a key criterion identified by Lee (2005, pp. 72, 76) and touches on a key theme of professional literature about library collections which can be traced back to McColvin's (1925) discussions of value-driven and demand-led selection. This idea of the significance of selection to the concept of collection was echoed by most of the library and information practitioner interviewees. Two also described the idea of selection in the context of preservation, both using "lifeboat" metaphors to describe this role. This idea of the challenge of "selection for preservation" also echoes Atkinson (1986), and the lifeboat image provides a particularly striking image for both the perilous state of knowledge at risk of loss and the difficulty of making these selection decisions.

#### *Collection as process – search*

The dynamic generation of a collection of information through searches conducted within information resources was discussed by A1: "you choose your keywords and... you can actually create your own customized collection." Two library and information practitioners also discussed the relationship between search and collections: LI4 identified search as the most significant process affecting the library collection, and discussed the limitations of current generation library search solutions, including resource discovery systems.

The overlap between definitions of collection and the process of search is not new – Online Public Access Catalogues (OPACs) and collective union catalogues provide both search facilities and digital representations of collections or groups of collections, which enable studies such as that by Lavoie and Schonfeld (2006) of the "system-wide book collection" as reflected in WorldCat.

#### *Collection as process – service*

LI3 defined the collection as "what we use to answer our reference enquiries and our information enquiries", suggesting the idea of active information, defined by use. This idea echoes both Ranganathan (1957), "Books are for use", and Hjørland's (1998, p. 617) observation that "A

collection should be able to provide 'satisfactory answers' to the questions raised by actual and potential users".

#### *Collection as store or thing: groups, sub-groups, and quantity*

For most of the interviewees, the collection could be defined as a store or a thing. LI3 suggested the usefulness of the term collection in capturing the totality of library's resources, comparing it to other terms – such as stock – and observing: "you'd still have to have some concept of the whole and I think collection just does make it a whole".

#### *Collection as store or thing – groups*

One policymaker defined collection as "a group of similar things that have got some sort of aspect in common", another described collection as "something you would curate... with a theme or a kind of motif around it". The term "curate" suggests both museum approaches to collection and the vocabulary of the emerging field of data curation. One academic concisely summarised the idea of collection as a theme-based group: "More than one and relating to a theme", and four social enterprise practitioners offered definitions of collection based on a grouping of materials around a particular topic. These ideas also reflect Lee's (2005, p. 76) findings about definitions of collection relating to a grouping of materials on a particular subject.

Most interviewees offered a generally inclusive view of the formats of materials that might comprise these subject groups. Some interviewees remarked on a shift from print to digital: for example, A2 observed that "it used to be that... you'd be seeking to digitize the paper world whereas now the paper world is a route into building up your digital world." LI4 identified a potential place for social media sources within a collection, including organisational Twitter feeds and blogs. Others also identified these types of material as information sources of increasing significance. Personal networks were cited as significant sources of information by all social enterprise interviewees, both academics and both policymakers; together with the use of social media sources, this seems to support the idea expressed by Bill Drayton that "People understand this field by anecdote rather than theory" (Bornstein, 2007, p. 120).

#### *Collection as store or thing – sub-groups*

A2 posed the question, "How many sub-groups of collection are there within a collection?" This idea of subsets making up a collection was also echoed by three social enterprise interviewees. LI3 offered a more technical library-focused explanation of the same idea:

"collection management will actually split down into the different subject areas of things like... Dewey. So you do

split up your collection into different areas by whatever is relevant in your kind of library.”

These responses suggest that collection is a useful term for implying a hierarchical organisation of information including subdivisions, as well as capturing the totality of everything within the whole collection. This again echoes Lee’s (2005, p. 73) findings about “subcollections” as an element of her interviewees’ definitions of collection.

### *Collection as store or thing – quantity*

In one interview, the role of quantities of material in defining a collection was explored in more detail. A2 suggested that the proportion of the total number of the relevant items represented in a grouping could determine whether or not the grouping should be seen as a collection:

“I think two can be a collection, one – I struggle with one being a collection. [...] two is quite... as long as there’s not three million in the field, then I don’t think you can have two as a collection; but if there’s only three or four, then two is perfectly good.”

This comment highlights the challenge of setting minimum numbers of items for a collection and suggests that this element of defining a collection is highly contextual.

### *Collection and access*

Nine interviewees discussed the concept of access as part of the definition of collection, including all six library and information practitioners. For LI4, it seemed that:

“now we’ve moved psychologically from the idea of holding physical stuff in this building and are much more relaxed about thinking about stuff which doesn’t necessarily belong to us but for which we have a role in providing access”.

LI5 echoed this, suggesting that “the term collection can mean anything that we provide access to for both teaching and research to do with the university”. Although it was sometimes unclear whether library and information practitioners included freely available web resources in their definitions of collection, for LI6 a “collection of links” did include free resources. O1 also gave a definition of collection based on “access to material via an online resource”.

These findings represent perhaps the biggest difference between the current study and Lee (2005), who suggested a significant difference between customer priorities of access and availability and librarian priorities of control and management. In the current study, ideas of access and availability seem to be core to library and information practitioner definitions of collection, although in some cases interviewees explicitly recognized that this represents a shift from previous perspectives.

## **Implications for collection development in the networked world**

Synthesizing the initial findings from this research project with the earlier discussion of the three management levels of collection development, in Table 4 we now suggest a tentative collection development hierarchy for the networked world. In this framework, “collection as thing” has a continuing relevance as the basis for the strategic planning of collections.

Strategic development should be driven by a vision of what globally accessible collections on any given topic may look like – the sort of “thing” such a collection may be. Scoping content held or linked to from a local collection and comparing it to content held in the system-wide collection (a collection of collections) provides a starting point for identifying opportunities for collaborative collection development. Policies are required, at both a local and a supra-organizational level, to identify and prioritize subject areas for collection development and to address the ongoing challenges of collection management, such as preservation of both print and electronic materials and collection evaluation. Some of the “Why?” questions addressed at this strategic level may include:

- Why are collections needed on these topics?
- Why should libraries collaborate to develop these collections?
- Why should libraries preserve particular materials from their collections?

This final question echoes Atkinson’s (1986, p. 347) discussion of the imperative for strategic coordination in libraries’ approaches to preserving low use materials of relatively low contemporary value but which may have value for future research.

At the tactical level, “collection as access” involves linking out to material located in the wider information universe, including links to accessible materials held in other collections, providing access through the network of the web. It may also involve tactical approaches to embedding librarians (Shumaker, 2009) and links to libraries in non-library networks, providing access within networks of communities of practice, such as the health sector communities described by Urquhart, Brice, Cooper, Spink, and Thomas (2010). Ensuring the interoperability of the information infrastructures, such as institutional repositories, used by libraries, both individually and collaboratively, provides another tactic for facilitating access. Some of the “What?” questions addressed at this tactical level may include:

- What is accessible?
- What local resources can individual libraries make accessible?
- What place does the library occupy in the information network and in the network of this community?

At an operational level, “collection as process” could describe mechanisms for capturing content created by a community as well as for exploiting contributions from the expert user. Potential developments in the field of linked data and other automated processes (including patron-driven acquisitions) may provide opportunities for dynamic collection creation, mapping new and emerging fields of interest and surfacing existing relevant materials. This operational level addresses “How?” questions such as:

- How can users contribute to collections?
- How can libraries surface information about existing collection materials relevant to emerging fields?
- How can automated processes facilitate the development of globally accessible collections?

Table 4. Proposed collection development hierarchy for the networked world

Management level	Collection definition	Example
Strategy	Collection as thing	Policies for: identifying and prioritizing subject areas; scoping collections (local and system-wide); collaborative collection development; preservation.
Tactics	Collection as access	Links to web-based materials and collections; interoperable systems; embedding libraries and librarians within non-library networks.
Operations	Collection as process	Support for community-created content; patron-driven collection; dynamic collection creation; linked data.

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## Conclusion

Developments in digital technology over the last 50 years have led to an increasingly networked information environment. Individuals use their personal and professional networks to meet their information needs, supported by the communication tools provided by the network infrastructure of the web. Collection development and management approaches must continue to evolve – as they have in the past – to manage new content which is relevant for their user communities, to demonstrate the relevance of the collections which already exist and to embed library and information services within the networked information infrastructure. Re-evaluating the term collection, with an increasing focus on the role of “collection as process” and “collection as access”, whilst not neglecting the importance of the “collection as thing”, suggests an evolving role for libraries with important new dimensions. This is a role based on the dynamic, value-based creation and management of collections that both maximizes use of local materials and uses network technologies and concerted supra-organisational planning to develop integrated globally accessible collections.

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