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Strategic management and development of  
UK university library websites

Susan Manuel

Doctoral Thesis submitted in partial fulfilment of the requirements  
for the award of Doctor of Philosophy of Loughborough University

April 2012

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Certificate of Originality

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## Abstract

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This research assessed website management and development practices across the United Kingdom university library sector. As a starting point, the design and features of this group of websites were established against criteria drawn from the extant literature. A particular focus was whether these websites complied with homepage design conventions devised by usability experts. Website management approaches and the skills of the personnel involved in website development were explored. In addition, the part strategy played in website management and development through formal and informal mechanisms was revealed. Approaches to assessment of end-user requirements gathered through user studies and web metric data, and the ways in which these informed developments, were also uncovered.

The extant literature on library websites covered a range of topics and geographically dispersed libraries. However, there was a bias towards the experiences of United States and Canadian university libraries. This presented considerable scope to explore UK university library website management and development activities. Empirical data were gathered through content analysis of 130 UK university library website homepages; national survey comprising online questionnaire to 112 named contacts with a key role in their library website and 11 follow-up interviews; and, three case studies involving a mix of web practitioner roles at each case study site. These data provided an extensive picture of current practice within this group of libraries. The experiences of library senior managers, website managers, web editors (academic librarians), technical consultants and a marketing specialist are all expressed in this thesis.

The homepage content analysis established the core content and features of UK library websites. These were a search box or link for searching the library catalogue, electronic resources or website; a navigation column on the left and breadcrumb trail to aid information location and website orientation; homepage design was repeated on library website sub-pages; university brand elements appeared in the banner; and a 'contact us'

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link was provided for communication with library personnel. Library websites conformed to 14 of the 20 homepage usability guidelines examined indicating that web managers were taking steps to ensure that users were well served by their websites. Areas for improvement included better navigation support (sitemap/index), greater adoption of new technologies and more interactive features.

Management and development practices were established through survey and case studies. These illustrated the adoption of a team approach to website management and development; that library web personnel and their ability to build effective links with colleagues at the institution made a valuable contribution to the success of a library website; corporate services and institutional practices played an important part in library website development; library staff were actively engaged in consultations with their website audience; and a user focused approach to website development prevailed. User studies and metric data were considered in the evaluation and development process. However, there were some issues with both data streams and interpreting metric data to inform website development. There was evidence of a lack of formal website policy and strategy expressed through website aims and objectives. Some web practitioners were unable to undertake evaluation and development activities due to staff/time shortages, technical constraints, corporate website templates, and, to a lesser extent, lack of finance.

Factors identified from analyses of these data were used to devise a library website management and development framework. This framework presents the setting within which library web managers operate their websites and highlights key variables for effective library website management and development. Gaps in current practice, or potential opportunities for enriching existing management and development approaches, are situated at the outer edge of the suggested framework. These include developing a support network to share expertise, investigating practices in other sectors and seeking funding opportunities for website development work.

Data and findings from this research are presented as a discussion based on a broad range of libraries with different characteristics (student numbers, research/teaching focus). As such, it does not offer insights for practitioners looking to compare their situation with

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like universities. However, it does present new insights into the practicalities of website management and development at UK university libraries.

Keywords: UK university library websites, website management, web librarianship, website development, user studies, web analytics, web metrics

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*Science is like a tree: contrary to popular belief, both trees and science grow at their edges, not at their core. For science, this means that most of the fruitful and exciting developments are not happening at the core of established fields, but are instead happening at the boundaries between such fields.*

Mika, P., 2007. *Social networks and the semantic web*. New York: Springer.

Quotation from the Forward by Frank van Harmelen (2007)



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## **GLOSSARY OF TERMS AND ABBREVIATIONS**

Association of Research Libraries (ARL): Association of research-intensive institutions in the United States and Canada. ARL focuses on the needs of its members and provides a leadership role in influencing public policies relating to research libraries and their user communities.

Library website: group of webpages providing information on, and access to, library facilities and resources.

Key Performance Indicator (KPI): either a count or ratio which is linked to an organisations strategy.

Website management: the process, roles, responsibilities involved in designing, delivering, maintaining and developing a website.

Web server log file: an electronic record of files served by a web server. Information contained within a log file includes date, time, IP address, browser, referrer and files served.

Web strategy: overarching website plan taking the organisations wider plan and mission into account.

Usability study: established set of processes and steps involved in testing the effectiveness of a website for its intended audience. This involves a range of activities involving end-users and professionals to gather feedback on the appropriateness of a website design, structure, content and accessibility.

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Web analytics: an iterative process of defining strategy, identifying metrics, measuring website use, analysing data and changing a website.

Web metric: a web metric is a unit of website measurement. At a basic level this can be understood to mean website traffic measures.

# Chapter 1 Introduction

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## *1.0 Background*

The World Wide Web and its uses are expanding and evolving. The tools and applications being developed to support access to resources through the web are becoming increasingly sophisticated. Web users' expectations are changing and patterns of use differ over time. These differences may in part be due to the nature of users themselves. Much is being made of the fact that we are in the midst of the 'Google generation' (Rowlands *et al.* 2008, pp.292-293). For these individuals use of the web is second nature, something they do with ease on a regular basis. However, changing patterns of web usage are also being driven by the fast pace with which resources are being made available through this medium, and the ever increasing number of information items on offer (Sawasdichai & Poggenpohl 2002, p.210).

Alongside users' expectations of the web are issues associated with maintaining effective resource provision in times when academic libraries' costs are rising and their budgets are being reduced. The evaluation of services to ensure cost effectiveness is an established and on-going process for any university library. However, at the intersect of digital resources and consumers resides librarians' understanding of the interfaces used for retrieval of resources.

Evaluation of interface design and the ways in which users navigate systems are underpinned by the disciplines of information science and computer science. The evaluation methods used include: human computer interactions, interface design, usability studies, heuristic evaluation, cognitive walkthroughs and the development of prototype designs and systems. In respect of library websites, understanding use has traditionally been arrived at through feedback and observations. Within these categories are a range of methods:

- Feedback mechanisms: survey questionnaires, focus groups and anecdotal evidence.
- Observation: task-setting and video recording of users interacting with the website.

The collective description of these efforts to understand websites are based on the outward facing aspects of web systems and services. Behind the scenes, web servers hosting library websites are a source of primary data relating to users' activities. These data are recorded in a server log file which typically provides copious amounts of data as each request to the server is recorded. Data available in a server log file includes the IP address of the visitor's host, request time and files served (Nicholas *et al.* 1999). These data were originally derived to satisfy the needs of web server administrators (Hunter 2001, pp.51-52). Thus, server maintenance decisions, such as the scheduling of server down time, are made with the benefit of data which records peak usage times, server load, and so on. The relationship between data to inform decision making and the provision of a fast, efficient and effective service in this context is clear. In an attempt to understand visitor activity on a website, the available server log file data has also been used to relate server activity to website activity. As Nicholas *et al.* (2000. p.400) noted, log files do not record end users' actions, they record computer actions. Although extensive, these data were not necessarily the most effective in providing the information required in this respect.

University library website managers looking to alternative tools and methods for gathering intelligence on website visitor activity might consider the evolving field of web analytics. With the information provided by services such as Google Analytics (Google Analytics 2007) or WebTrends (WebTrends 2008) librarians are able to develop a richer picture of website use. For example, web analytics data provides insights into navigational elements, website content, embedded assets, and links to internal and external services.

To achieve effective use of the intelligence gathered from web analytic tools, library management and strategy are brought into the framework for web analytics. The analysis of visitor activity might then be used as a driver for change to a library's website.

This research identified current practice in relation to the management and development of United Kingdom (UK) university library websites. It investigated the potential for understanding visitor activity on a website through web analytic tools and the maturity of use of such tools by UK university libraries. Finally, the ways in which evidence of website use was applied to making improvements to library websites, in line with strategic direction, was analysed.

The following definitions are provided as a guide to the scope of this research.

The term 'website' was taken to mean:

*A set of web pages with an organizational or subject focus (Prytherch 2000, p.770).*

Guided by this definition, services such as the library catalogue and institutional repository were excluded from investigation. The focus of this research was the management and development of webpages not external services.

A library's strategic plans, and its planning processes, were regarded as being the:

*Coordination of an organization's activities to achieve specific goals and objectives in the face of constant change. Allocation of resources to achieve specific goals and objectives (Keenan & Johnston 2000, p.28).*

Strategy provides direction and focus for website development and analysis. This includes consideration of resource and staffing to achieve website aims and objectives.

### *1.1 Research aims and objectives*

The aim of this research was to evaluate UK university librarians' current practice for measuring and assessing user activity on their libraries websites. The overarching role of strategy and policy in website management and development was also determined. This aim was established to answer two broad research questions:

- What are the core design, content and features of UK university library websites?
- How are UK university library websites managed and developed?

The objectives of the research were as follows:

1. Website content analysis:
  - a. To conduct a literature review to establish website design recommendations and standard characteristics of university library websites.
  - b. To analyse the content of UK university library websites to establish core characteristics and compliance with usability design guidelines.
2. To record and analyse UK university library website management and development practices, including strategic dimensions.
3. To evaluate the advantages and disadvantages of the methods used for establishing UK university library website effectiveness.
4. To identify and describe the factors required for effective management and development of UK university library websites, and to construct a framework around these factors.

1.2 Thesis structure

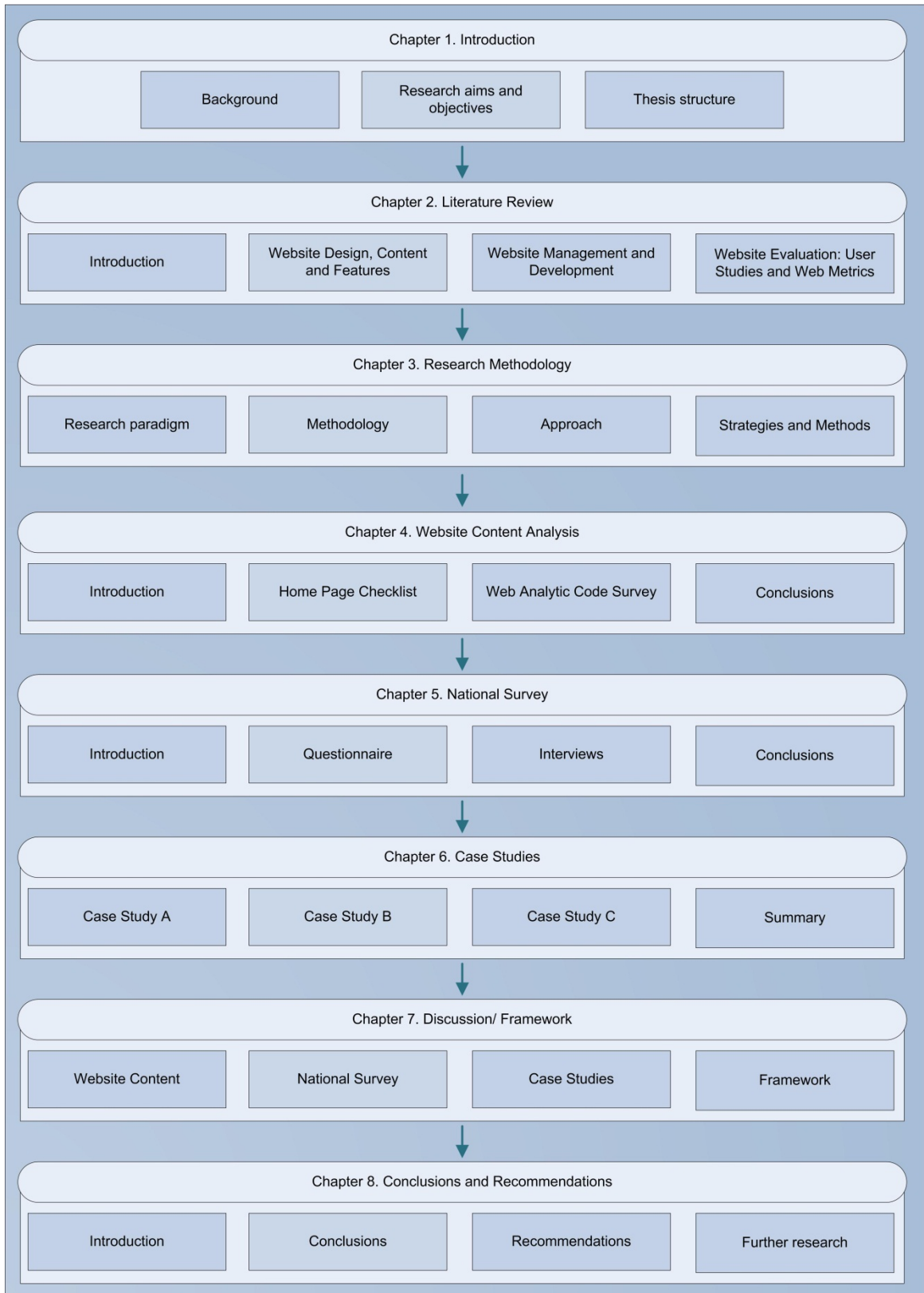


Figure 1-1: Thesis structure

A diagrammatic representation of the structure of this thesis is presented in Figure 1-1 above. Chapter One presents an overview of the topic, university library website management and development. It also provides an indication as to why librarians are concerned with developing their websites to meet various stakeholder requirements. Website design conventions and library website content/features were established for comparison with UK university library websites. Chapter Two extends the themes identified in the introduction and presents a review of the extant literature. It highlights gaps in research relating to UK university libraries and defines how this research will fill these gaps in knowledge. Chapter Three provides a map of research objectives, methods and thesis chapters, and justification for the methods used.

Chapters Four, Five and Six present findings from the research methods. Chapter Four reports the results of a UK university website content analysis, usability design compliance and web metric code survey. Chapter Five presents the findings from a national survey of UK library web managers into their management and development practices. Chapter Six offers an in-depth view of UK university library website management and development through case studies.

Chapter Seven discusses the findings and the development of an organisational framework for successful website management and development. The discussion in Chapter Eight focuses on the conclusions relating to the objectives of the research.



## Chapter 2 Literature Review

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### *2.0 Introduction*

The literature review evolved over the period of this research. As an on-going review it underpinned this thesis and was used as a tool to inform progress at each stage of the research. It guided the overall approach and enquiry into website management, maintenance and development. It also helped frame specific questions to be addressed by the library website content analysis, national survey and case studies.

The literature relating to website creation, management and evaluation formed the basis of this chapter. Prior studies focused attention on a website's homepage. They considered its importance in relation to other pages in the website, and the layout and content features desirable in a well-designed page. The value attached to a website was investigated, and from this drivers for undertaking research to evaluate website usability established. Usability issues were well documented in the literature and an overview was included in this review.

Literature relating specifically to libraries focused on analysis of website content, design, features and website purpose. These studies adopted the use of a matrix of elements against which websites were recorded, or reported the results of surveys and focus groups.

Apparent themes from the library's perspective included: their strategic direction, website purpose, determining user requirements, delivering a website to meet users' needs, and developing an effective website into the future. These dimensions were grounded in library policy and strategy, as well as university policy, guidelines and initiatives. In respect of users, issues associated with usability (ease of navigation and access to information), internal and external sources of information (search engines, Virtual Learning Environment - VLE, information websites, information services and peers), and drivers for returning to a library website were addressed. This long-term view

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incorporated competition from search engines, the VLE, other university library websites and information providers.

### *2.0.1 Research objectives*

The literature review helped categorise prior literature addressing themes explored in this research. It set the scene for this research and provided insights into established knowledge of librarians' management and development of their websites. Although the research focus was UK university library websites, this review included literature from other libraries and sectors. The review established compelling reasons for a UK university library to maintain a presence on the web. It considered the core features of UK university library websites, as well as the elements that encompass website creation and development. This included established good design practice, and current thinking in terms of website maintenance practices and usage measurement. In essence, the review provided insights into existing practice for website management and development, and the advantages and disadvantages in the methods librarians employed for evaluating user experience and website usage.

As well as providing context, the review informed dimensions studied at each stage of the research process. Thus, the extant literature mapped onto the research objectives as follows:

Objective 1a. To conduct a literature review to establish website design recommendations and standard characteristics of university library websites.

Analysis of literature relating to website content and features, design conventions, trends in use and future development potential to meet user requirements, informed the creation of a checklist of website content categories and specific library website features.

Objective 2. To record and analyse UK university library website management and development practices, including strategic dimensions.

The literature established drivers for website delivery, importance of library websites, approaches to website management and development including formulation of mission and strategy documents. Management and development themes investigated included governance, staffing levels, staff skills, project management and technical dimensions.

Objective 3. To evaluate the advantages and disadvantages of the methods used for establishing UK university library website effectiveness.

Methods of gathering user feedback and the part these played in librarians' evaluation activities were established. The strengths and weaknesses of these methods for improving understanding of users' expectations and experiences of library websites were explored.

Objective 4. To identify and describe the factors required for effective management and development of UK university library websites, and to construct a framework around these factors.

Three themes in the literature: website content, management/development and evaluation were explored in relation to UK library websites. Data gathered through a range of methods informed the development of a framework of library website management and development within the context of a university setting.

In addition, limitations and gaps in the extant literature relating to library website management and development were highlighted. Areas where this research added new insights to the existing literature were noted.

## 2.1 Website content features

The content and features of library websites were well documented in the literature. Analysis of company homepages was conducted by Nielsen & Tahir who stated:

*The most crucial role of the homepage is to communicate what the company is, the value the site offers over the competition and the physical world, and the products or services offered (Nielsen & Tahir 2002, p.2).*

They elaborated that a homepage should have a distinctive appearance, setting it apart from the remainder of the website. The homepage was typically the primary landing page for a website, the main page by which visitors entered a website. It provided a means of orientation for visitors with links to all sections of the website. It was commonly returned to when a visitor became lost. Nielsen (2000) regarded the homepage as being the most important page on most websites. But as Morville (2005, p.106) pointed out, for many visitors “the homepage is nothing more than a signpost, hastily scanned and quickly forgotten on the way to somewhere else”. This might be addressed by the design of the page, but according to Morville (2005, pp.103-104) one of the issues with designing a homepage was satisfying the need to communicate with users whilst effectively marketing goods and services.

Nielsen & Tahir’s (2002) analysis of 50 company website homepages was based on their comprehensive homepage design guidelines for usability. These guidelines cover features relating to layout, hyperlinks, navigation, search, images, animation, and many more. Each recommendation was accompanied by a value (essential, strong or default) which was an indicator to the relative importance of compliance. Their study highlighted the need to design for usability to build brand and customer loyalty.

Research involving analysis of library webpages tended to focus on the detail on the type and range of content, features and navigation. One reason for focusing attention on website design was that poor design quality resulted in diminished benefits over those gained by establishing a presence on the web (Kim, Shaw & Schneider 2003, p.17). The top ten features of a library website were listed as:

1. bookmarks;
2. practical information;
3. training guides;
4. website search;
5. online publications;
6. library catalogue;
7. library friends;
8. ask a librarian;
9. subject folders/portals; and
10. library publications (Griffiths 2004, pp.84-87).

Harpel-Burke (2005) based analysis of 80 academic libraries at medium-sized universities on Nielsen & Tahir's homepage design criteria. Nielsen & Tahir (2002) analysed business homepages based on 40 issues with 'strength of recommendation' for each. These issues were grouped into the following categories:

- basic page layout;
- fundamental page design elements;
- navigation;
- frequent features;
- graphics and multimedia;
- advertising; and
- typography.

Harpel-Burke aimed to assess library webpages against another sector and to establish whether Nielsen & Tahir's homepage usability standards were applicable to the library sector. Harpel-Burke adopted a sub-set of Nielsen & Tahir's criteria grouping it into four categories: search, navigation, design and general features. Nielsen & Tahir's ranking of essential, strong and default was used. In conclusion, Harpel-Burke (2005, pp.205-206) noted that library homepages compared favourably with the business homepages evaluated by Nielsen & Tahir. Constraints that librarians faced in delivering their website were noted; particularly where systems were maintained outside of a library's control,

where university designs did not accommodate a library's needs, and where common content elements appeared but did not reflect library website content, for example, university navigation links, website map and search box.

Tolppanena, Millerb & Wooden (2000) used a checklist to evaluate the core features of 133 medium-sized United States of America (USA) academic library websites. They discovered 31 core features, those elements present on at least 50% of websites, and concluded that homepage designs were generally poor. This contributed to navigation issues which frustrated users and caused them to use search engines in preference to their library's website. Suggested improvements in navigation included provision of a website search tool, website map and menu bar. Reducing clutter on a website was also viewed as a way of making it easy for visitors to find the information they required. In addition, the authors suggested avoiding library jargon and providing more self-guided instruction, such as tutorials. In a survey of 107 Association of Research Libraries (ARL) member institutions' libraries, Detlor & Lewis (2006) also used a codebook of features for assessing library website content. They recorded 33 elements for comparison and noted innovative features. These included an option to book a study room, Rich Site Summary (RSS) feeds for new books and a knowledge base. Under-used functionality included a website map, used by 24%, and alt text, used by 35%. They also noted the structure of these websites tended to reflect libraries' organisational practices rather than the tasks users would come to their websites to perform. Search options were reported to be inadequate both in terms of libraries offering this feature (70%), labelling/search descriptor and variety of content being searched (Web, catalogue or electronic resources) (Detlor & Lewis 2006, p.253). The authors recommended that more resources needed to be invested into interface design, that librarians should investigate new technologies and that they should monitor best practice. They also suggested that users should be able to customise their view of the library website and that information should be promoted to users (Detlor & Lewis 2006, pp.255-256).

One paper reported on a comparison of university library websites in four English language speaking countries (Still 2001). A checklist of elements was devised and applied to 50 websites from the UK and USA, and 25 from Australia and Canada.

Common content was established as providing access to an online catalogue and databases. Divergence in content was most apparent for the availability of encyclopaedia, pathfinders (subject guide), request forms, remote access and instructional materials. The author concluded that these differences were due to educational environment and therefore, cultural in nature (Still 2001).

Investigations into the properties and interlinks between library homepages and pages targeted at specific user groups were undertaken. These studies identified an important relationship between a library's homepage and a set of niche pages within the website. One key factor for users was their ability to locate the pages they required easily (Adams & Cassner 2002, p.10). This had implications when the relationship between library and university websites was considered. Adams & Cassner (2002) conducted analysis of distance learner pages of libraries in the ARL group. A total of 48 pages was analysed for elements covering design (15 items) and content (28 items). Recommendations arising from their research were to work with web developers to improve design and to provide an explanation of library jargon. Gardner, Juricek & Xu (2008) undertook a similar investigation of 54 academic libraries' pages for faculty. Libraries were drawn from the American Library Association's (ALA) list of the nations' largest libraries and included university and other public and private libraries. A checklist of 48 items grouped into five categories (about the library facility, collection, current awareness/issues, services and library contacts) was applied to each website. Of particular interest was the location of faculty pages in relation to the library homepage (distance from homepage), page content, language and technology features. The majority of faculty webpages were accessed from the homepage or within two levels of the website hierarchy. Pages were generally jargon free but uptake of new technologies was low. In addition, there was scope to promote lending, as well as teaching and research support. Osorio (2001) investigated the design and content characteristics of 54 USA and Canadian science and engineering library websites. Their features were recorded against a matrix of 66 elements and it was interesting to note that only 12 websites featured a university logo and the average screen length was two pages. Just over half (23) featured a website search and only five provided a website map/index.

Several papers reported the need for librarians to use new technologies to attract and engage with website visitors. Gardner, Juricek & Xu (2008, p.23) discovered that librarians were not developing technology rich websites to attract and engage with website visitors. Customisation and personalisation features were becoming increasingly common on the web but were reported to be lacking on library websites (Detlor & Lewis 2006, p.255). Librarians were also encouraged to monitor trends in technology and best practice (Detlor & Lewis 2006, p.254). Staying current might involve referring to websites from other sectors and monitoring developments outside the library sector.

Analysis of content and features of UK university library websites was lacking in the literature. This research addressed the gap. Prior studies informed the development of a comparable checklist suitable for the UK university library sector.

## 2.2 *Website management and development*

The importance attached to a website was discussed by a number of authors (Kim, Shaw & Schneider 2003, pp.383-392; Palmer 2002, pp.151-167). The library website was regarded as an established information channel accessed on a regular basis by university staff and students, and by external visitors. It was often the primary point of contact between a library and its users and as such was a vital communication channel (Adams & Cassner 2002, p.10). It may be true to say that university libraries could not operate in the market without a web presence to the extent that:

*The web site has become one of the academic library's most visible artifacts for communicating with users, and the home page has become the starting point for users conducting library research to explore the resources available (Osorio 2011).*

This statement provided an indicator to the value of a library website and user experience. In essence, a website provided users with their primary point of contact with an organisation. Therefore, an effective website design was crucial. For website visitors, this was considered influential in terms of their experience of using a website, and as a means



of evaluating the credibility of the organisation (Kim, Shaw & Schneider, pp.23-24). Osorio noted that a library website was of value as the starting point for research activities (Osorio 2001). Indeed, the purpose of a library website was identified as being “a tool for information, reference, research and instruction” (Cohen & Still 1999, p.287). Its visibility naturally made it the first port of call for conducting any research where use of library resources was paramount. Five years after Osorio’s research, library websites were reported to be losing their strong hold over their intended audience of academics, researchers and students (Detlor & Lewis 2006, p.251). This was in part attributed to strong competition from search engines (Detlor & Lewis 2006, p.251; Porter 2007, p.126; Duke & Tucker 2007, p.53). Harpel-Burke (2005, p.206) also referred to literature relating to students’ tendencies to consult search engines and other online sources rather than the library website for information for their assignments. Today’s library website users were also reported to be arriving with a set of expectations and skills borne out of what has been termed the ‘Google generation’ Rowlands *et al.* (2008). However, claims about their capabilities were considered to be exaggerated when their information literacy skills were examined (Rowlands *et al.* 2008). In relation to library websites Harpel-Burke (2005, p.195) succinctly noted that “users of their websites may be savvy web users but not sophisticated researchers”. This was supported by VandeCreek (2005, p.189) who advised that some usability problems were attributed to poor information literacy skills. Technology readiness factors may also intervene in website usability (Massey, Khatri & Montoya-Weiss 2007, p.299). Detlor & Lewis (2006, p.251) suggested that building “robust library Web sites” was one solution to attracting users in the face of competition. These factors place the library web presence at a turning point where there is a need to address issues of how best to develop these websites into the future.

A library website’s central role in service provision and marketing suggested a strategic view of its management and development should be of primary consideration for library managers. In a survey of 25 UK organisations Taylor *et al.* noted that:

*.... there appeared to be no formalised approaches to determining the overall purpose of the organisation’s website, or determining the business processes to be supported by the website (Taylor et al. 2002, p.390).*

One focus for research into business websites was that of website management and its relationship to organisational strategy. Chung & Law (2003) investigated strategic dimensions to hotel websites and website management issues. They surveyed hotel managers for their views on five website dimensions (facilities information, customer contact information, reservations information, surrounding area information, and website management). These dimensions were then used to record website performance. Huizingh (2000) considered support for the website within an organization and links with their marketing plan. Brand recognition also featured in the design of business websites (Cox & Dale 2002, p.864).

Library strategy was explored through website mission and strategic planning. Mission statements typically defined the purpose and values of an organisation while strategies set out the aims by which these were achieved (Brophy 1991, p.137). Cole (2002) described the importance of developing a mission statement for the benefit of an internal and external audience. Internally, it provided a focus for staff efforts and externally, it focused attention on library direction. The mission of a department also related to, and supported, the higher mission of the organisation. To discover adoption and use of a mission, Cole evaluated websites of 50 business schools offering a Masters degree in Business Administration. Thirty-two had such a statement on their website and these tended to be simple texts with a focus on the terms 'business leader' and 'management'. Kuchi (2006, pp.148-50) also focused on the importance of communicating library mission to alert stakeholders to library direction and to provide a context for decision-making. The recognised importance of developing a mission was evidenced by the 78% of 111 ARL websites making it available. However, despite its availability prominence given to it on these websites was questioned. None featured any mission text on their homepage and only one had a direct link to it from their homepage. Brophy (1991, p.135) described the UK perspective by first acknowledging that mission statements were less common in the UK than in the United States (US). Brophy (1991) surveyed 89 UK academic libraries requesting a copy of their mission statement. From the 72 respondents, 35 provided a statement with common themes addressed. Those being: to serve users' needs, provide access to information and to support learning and research. Franklin (2009) reported on library strategy from the perspective of aligning strategy and service

structure to that of their university's mission. This shift in perspective was instigated by the University Provost who charged departments with the task of adapting their strategic plan, to support the university's new academic plan (Franklin 2009, p.496). Organising around library functions shifted to organising to support the university plan, with metrics incorporated into the library's strategic plan for measuring success.

Leading on from mission was strategic planning; Decker & Höppner (2006) addressed this issue from the perspective of librarians' budgetary decisions and contributions to teaching and research. In their view, user satisfaction was a key element in evaluation of services and library effectiveness. Strategy was framed by a library's mission and service-level agreements with efficiency gains being realised through data analysis. They considered customer intelligence stored in a database and the amount and complexity of these data required for analysis. A similar perspective was presented by Whang (2007, pp.95-96) who argued for strategic website management, referring to library strategy, institutional mission and web measurement, achieved by defining website goals and associated metrics.

Hendricks (2007) identified a gap in the literature relating to library web policies. This was addressed by surveying librarians for information on such policies and the presence of web advisory committees. An invitation to library webmasters to complete an online questionnaire was circulated through three email lists resulting in 60 responses. Questions covered the role of webmaster, presence of a web committee, availability of a web policy, degree of control, availability of support and connection to the university through their webmaster and corporate design. Hendricks (2007) found that:

- 64% had an advisory committee;
- 54% had a web policy with the majority (93%) conforming to university web policy;
- 53% had full control over their library's website and 23% had minimal control;
- less than half their time per week was spent on website duties;
- 48% had their own logo;
- 15% contacted their university webmaster with questions; and

- 43% followed their university's website design.

Hendricks (2007) recommended that a web policy and an advisory committee were necessary due to increasing technical complexity and range of content. In addition, to achieve a fair workload, distribution of duties under a decentralised maintenance model was preferred. Recognised limitations of this review were that calculating an accurate return rate was difficult, and the content of library web policies was not investigated.

Management of library websites was an important factor in achieving long term success. Garrett (2003) outlined the crucial success factors for web teams. His "nine pillars of successful web teams" were categorized as either tactical or strategic dimensions forming a honeycomb of adjoining dimensions. User research related factors appeared to one side, and project management factors the other. These two factors (user research and project management) were two of the pillars, the remaining seven being: website strategy, technology strategy, content strategy, abstract design, technology implementation, content production and concrete design. In Garrett's experience successful web teams were comprised of staff whose combined competencies (skills) encompassed the nine pillars outlined above. This model could be viewed as an 'ideal world' scenario against which the realities of managing and developing an academic library website are compared.

There was a scarcity of literature discussing UK library website management and development. Available studies from the UK and other countries revealed a range of methods by which library websites were managed. The role of webmaster has evolved over time and as workloads have increased responsibilities were more likely to be distributed across a web team. Duties covered by this team included editorial, managerial, technical and design aspects of website provision. (Griffiths 2004, pp.59-65). Being a lone web manager required a diverse skill set including: design, content creation, technical capabilities and management skills (Fichter 2004). The early model of library website production involved a number of enthusiastic individuals creating and maintaining pages in an ad hoc fashion. This evolved into a more structured process of management by teams or committees to provide direction (Medeiros 1999, p.528). A web

committee added authority to the decision making process. The committee's role was to discuss policy and practical issues, keep up-to-date with all aspects of the website and involve other staff in website delivery through creation of information and resources (Griffiths 2004, p.148). Without decision making authority the process of redesigning a website was reported to be too protracted with everyone contributing their views on website design (Felker & Chung 2005, p.59).

McCready (1997, p.89) discussed the process of creating a library website and recommended adopting a web committee of between three and five individuals. The rationale for this was that small groups were able to make decisions easier and quicker. It was recommended that a web committee be comprised of a representative delivering front-line services, a webmaster and at least one additional member of staff. A small team approach to website delivery also featured in Vaughan's (2001) detailed description of the University of Nevada-Las Vegas library's website implementation and redesign processes. Their library web team drafted the original website proposal and a committee was convened to implement the project. This web team committee consisted of six staff representing various sections within the library. From the outset they wanted to create website policy describing their website mission, goals, content and maintenance. When this document was finally devised it covered website mission, personnel responsibilities, design guidelines, project guidelines and maintenance/administration. Since its inception the website was managed by a team/committee structure with a mix of experienced web staff, and those with a fresh perspective on the website. Speight & Perkins (2007, pp.51-53) also recommended a small team approach and in their case two individuals were tasked with redevelopment work to ensure consistency of approach. Although this improved decision making and consistency it placed a considerable workload on the two individuals concerned. In contrast, a large team approach to website redesign benefited from the involvement of subject specialists and customer services staff that understood their website users' needs and distributed the workload across a number of people (Tolliver *et al.* 2005, p.158).

In applying best practice in a website redesign project, Mellone & Williams (2010, p.178) highlighted the characteristics of leadership and teamwork as essential criteria for website

success. They added that this extended to coordination and collaboration between librarians and Information Technology (IT) staff, and between project groups. Their library migrated from its initial model of web management by systems personnel and a web committee, to a web team and advisory groups. The web team consisted of a coordinator to facilitate meetings/discussions and who assisted with web mark-up; and a part-time technician who focused on website design, mark-up and programming. Two advisory groups, of three librarians and four bibliographers respectively, contributed to website design, website architecture, content, electronic resources and mediation of any website issues.

One limitation of these papers in gaining a perspective on sector wide practice was that they reported the perspective of individual libraries. For an overview, reports on surveys needed to be consulted as they provided a broader view from a larger number of respondents.

Church & Felker (2005, p.546) considered success factors for web teams by reference to the literature. They identified three main challenges for web teams:

- forming a team;
- effective management; and
- implementing the role of web administrator.

They added that, web projects required individuals with appropriate skills and this requirement should be the driver for team selection, not internal politics. However, they also noted that, with interest, it is possible to learn the required skills and so team working is needed for success. Provision of a budget for training in website management and administration duties was a prerequisite. Through a synthesis of the literature they defined seven key web development skills:

1. project management and resource allocation;
2. information design skills;
3. graphic design skills;

4. graphic and page production skills;
5. programming skills;
6. technical and networking skills; and
7. content creation/editing skills (Church & Felker 2005, pp.547-548).

Other important considerations were ensuring staff had adequate time to undertake their web duties, failure to do this resulted in stress and frustration, and giving the web team the authority they needed to make decisions and achieve their work. This was confirmed by Griffiths (2004, pp.71-72) who noted that web team members require training and time allocation to ensure all aspects of website duties are covered, including understanding technical developments. Attendance at conferences and other web related events is also necessary to ensure the website remains competitive.

Project management skills were central to a survey conducted by Kinkus (2007). A review of librarians' project management skills was carried out via a survey of 47 American Library Association Accredited Masters Programs and analysis of job advertisements in 'College and research Libraries News' in 1993, 2003 and 2004. The survey realised 26 responses, with 21 programs including an element of project management in their course. Studying librarian job vacancy adverts for specific project management skills proved difficult. Kinkus (2007) looked for evidence of responsibility for project management but excluded involvement in projects. Although inconclusive, there was a general upward trend of including project management in librarians' responsibilities. However, the number of posts featuring project management was small and the author recognised that there were limitations in only analysing data from a single source taking a snapshot of three years.

Taylor *et al.* (2002) identified a gap in the literature relating to website development work. They asserted that discussions on website development methodologies, standards and techniques used are missing. They studied 25 UK organisations in a number of fields including: education, manufacturing, financial services and local government. Their interviews with IT staff revealed that relatively few website design techniques were being used (hierarchy chart, storyboards and webpage layouts) and that 17 of the 25

organisations did not use any of these tools. Furthermore, only seven undertook formalised website testing of individual webpages, checking for failed links, or evaluating different browser compatibility. In all 25 organisations, internal IT staff or external IT agencies undertook website development work. Other staff were involved during website projects in 23 organisations. Website development activities were approached in an ad-hoc manner with very few formal techniques. The common approach was reported to be:

- website content discussed with staff;
- images and text created by project staff;
- prototype developed for staff evaluation;
- website refined to match staff suggestions; and
- website launched when staff were satisfied with it.

Documentation covering website development was rare, being produced by nine of the organisations studied. Where standards for website development were adopted (13 organisations), these had been developed in-house and included guidance on design, layout, contents, development tools and testing. The authors' concluded that IT managers and developers were in danger of frustrating their website users with overly complex websites also adding to their own maintenance efforts. In addition, they noted that further academic research in this area would be valuable (Taylor *et al.* 2002).

Shropshire (2003) addressed the lack of literature on library website management through a multiple case study approach. Her research, of website management at three medium-sized academic libraries in the US, revealed experience of staff involved in a range of website duties, as well as a senior manager perspective via library directors. General similarities in approach were revealed with existing library staff being used for website duties, management was achieved through committee, web authors were drawn from across the library, and none of the libraries involved had undertaken a user study. Themes in common with other studies include:



- using volunteers to undertake web work was not always the best option;
- web managers may lack the authority to ensure tasks were completed;
- decision-making/management through a web committee works well; and
- although user studies are believed to be beneficial, staff lack the time needed to facilitate this work.

Shropshire (2003) also noted that, as well as technical capabilities, the role of web administrator required an understanding of their library's mission, a vision for the direction of the website and the ability to mediate staff disputes. The importance of the library website in respect of the university website also featured, with a member of each library web team having a role on their university's web team. Some of the web managers interviewed believed that their university may attempt to exert a greater influence over the library website in the future. Smaller libraries faced challenges because they lacked technical staff to administer their website (Ryan 2003, p.207).

Alongside library website purpose, strategy, management and staffing technological considerations in website creation and delivery were also considered. Connell (2008) reported on a survey of web developers at academic libraries in the US with the sample being drawn from the Carnegie classification list. Of the 94 respondents reporting that they used a database driven system, only 24 of these used a Content Management System (CMS) (Connell 2008, p.126). Fulton (2010) discussed the drivers for implementing a CMS as being to improve website management and accessibility. A survey of 116 individuals at ARL (US and Canada) member institutions, for whom contact details were located, brought 40 responses. Those using a CMS totalled 28. Of these, 20 libraries were using their own system whilst eight used their university's CMS. Of the 12 not using a CMS, 11 had considered adopting one. When asked if they had considered migrating to a different CMS, 18 replied affirming that they had. This was for reasons related to lack of functionality or difficulty of use of their current CMS. Those not considering switching CMS (10) gave reasons related to being satisfied with their current system, or that the CMS was controlled by their institution. The author noted that concerns were expressed about the cost of maintaining a commercial or open source system. She concluded that sharing views may bring about the development of a CMS

capable of meeting librarians' requirements. Kane & Hegarty (2007, pp.278-279) discussed the benefits their library wanted to achieve in adopting a content management system. These included:

- consistent look-and-feel;
- improved accessibility;
- web standards compliance;
- automation of routine time-intensive tasks;
- managed workflows; and
- content versioning and archiving.

One aspect of their website that they were keen to maintain was its distinctive visual appearance. There were concerns that this would not be possible with the new CMS. However, this was achieved because they managed their own website and a member of staff, experienced in website design, assisted. Speight & Perkins (2007, p.52) reported a different approach to maintaining website consistency. Their method was to implement a website style guide. The guide was made available on the staff intranet but was not adhered to by all individuals. Some believed it to be too pedantic or not applicable to their pages. To overcome these issues a web editorial group was created and the authors suggested that senior management buy-in was an essential component in delivering a strong brand message.

In addition to systems use, website templates were also a factor in library website delivery. Peterson (2006, p.217) described a template as: "a common or shared template used to control the formatting of Web pages in different departments on campus". To discover the extent of university website template use by libraries, Peterson (2006) analysed 216 higher education institutions. A library website was determined to be using an academic template if it shared common elements (banner, navigation and footer) with the university website. Fifty percent of library websites surveyed were found to be making use of an academic template at least on their homepage. However, not all of these libraries made use of all the template elements. This indicated a degree of flexibility in approach to controlling webpage formatting at the universities in Peterson's analysis.

Advantages and disadvantages to website template use were reported by Peterson (2006, pp.218-220). Advantages included: a professional design, uniform style, improved usability and compliance with accessibility requirements. Disadvantages included: limited space for library content, design not meeting library requirements, difficult to modify, confusing functionality (for example, does search cover library, university or the Web?), confusing terms (catalogue: is this course catalogue or library catalogue?) and finally the time required to train library staff. Harpel-Burke (2005, p.206) also addressed the issue of libraries use of academic templates noting that librarians were not always able to control elements of their website design due to template use and lack of influence over university systems. There were a range of strategies for effectively using an academic template beginning with developing a mission and strategy in-line with library and university mission. Staying current with usability and web design trends and sharing experience with other librarians were other useful strategies. Other important factors include integrating into the university web committee and educating university administrators and designers about the library and its website requirements. Peterson (2006, p.220) concluded that because of the importance and complexity of institutional websites academic template use was set to increase. One example of a university web team recognising the need for a flexible approach to a complex library website was reported in Speight & Perkins (2007, pp.52-53). Following user studies and extensive work to ensure their library website met users' needs the university announced plans to implement a uniform website template. Recognition of the library's case for meeting their website users' needs indicated that all aspects of the new corporate template would not have to be adopted.

Lombard & Hite (2007) addressed the issue of balancing library website users' needs and university web guidelines. They identified a gap in prior studies relating to website administration and investigated this through adoption of university website templates and processes involved in website administration. They surveyed individuals in university libraries with responsibility for webpages and 73 usable responses were returned. Four departments maintained the university web presence (IT services, public relations, the library and administration). Library website needs were accommodated by university web managers and they were not adversely hampered by university web guidelines.

However, individual responses highlighted some restrictions resulting from a corporate template and technical limitations resulting from university systems. Their survey also showed that librarians did not believe that their library web service would be more effective if they controlled their own web presence. This was attributed to the technical expertise required, for example, in running a web server. However, the findings highlighted differences in perceptions of librarians having control over their own web services, with a greater degree of difficulty experienced by those reliant on another university department. Authors noted that perceptions in the terms used to describe website administration, maintenance, management or development, required clarification across the library sector.

Hinton (1998) wrote about the issues faced by university web managers in unifying the corporate web presence. The difficulties faced by The Australian National University were encapsulated as:

- unifying over 100 web servers into a single identity;
- providing effective resource discovery for a diverse audience; and
- guaranteeing quality (Hinton 1998, p.311).

They developed a ‘home site concept’ with the website serving a single purpose, to aid resource discovery. This was supported by the website structure and uniform design grid with university branding.

A survey of UK university web managers was conducted by Cox & Emmott (2007) to fill a gap in knowledge of website management covering staffing, resources, technologies and future direction. The survey received 107 usable responses from university web managers at 87 institutions. They identified the purpose of the university website as serving the needs of internal and external audiences. This was reflected in the drivers for web provision which were: recruitment, reputation/brand/external communications and information/internal communications. There was no common standard job title for university web managers and activities carried out within the role varied according to seniority and gender. Common activities included liaison, interface design, project

management, planning and supervision. Web managers tended to manage a small team of staff. The strengths of the university web presence were its comprehensive content, accessibility and navigation. Weaknesses included: issues with consistency in presentation (particularly with departmental websites), poor navigation or website architecture, and currency and accuracy of content. Threats to the web presence focused on resourcing and support, such as: lack of investment, lack of central control over web authors and lack of management strategy. Cox & Emmott's study provided valuable context for this research into library website management and development as it presented university web managers' perspectives on institutional website management.

The literature on website management and development activities revealed that US libraries were more likely to have a visible mission statement on their website than UK libraries. There was some evidence of web policy being created and management was handled via an advisory web group. A range of skills were required for effective website delivery with evidence of skills gaps in some areas and web managers did not always have authority to drive work through. Development methodologies, standards and techniques were not reported to be commonly used. Content management system use was also sporadic, but thought to be beneficial as it improved standards compliance and provided a consistent look and feel to the corporate website. Libraries benefited from corporate templates as these delivered a professional appearance to their websites. However, space for library content within a template could be limited and library needs were not necessarily considered. It was noted that university web managers strived for consistency across the corporate web presence.

This research will add a much needed UK library web manager perspective to the existing literature.

### *2.3 Website evaluation: user studies and web metrics*

One area for consideration was assessing what librarians gained by studying the use of their website. Vaughan (2001, p.88) stressed the importance of assessment in establishing an effective and intuitive service for users. Fourie & Bothman (2007, p.264) listed a

number of benefits and areas of potential advantage to conducting user studies. These included: improved interface design, navigation and information skills, and better search engines and website architecture. The best approach to gathering web usage intelligence was reported to be one which provided both quantitative and qualitative data (Fourie & Bothman 2007, p.265).

There are a number of tried and tested methods for evaluating websites including heuristic evaluation, surveys, focus groups, task based analysis and interviews. Web analytics, a relatively new technique when this research was undertaken, can be added to this list. There are advantages and disadvantages to each of these methods but conducting user studies can aid organisations in their understanding of their website and its visitors. The use of these methods were reported in the library and business literature (Casaló, Flavián & Guinalú 2008; Ghaphery 2005; Harley & Henke 2007; Nicholas, Huntington & Williams 2002; Tan & Wei 2006; VandeCreek 2005; Yeadon 2001;).

The structure, design, functionality and content of library websites were the focus of a range of studies. Reasons for investigating website use varied, but essentially these studies set out to establish the utility of a range of websites. A systematic evaluation was often undertaken to measure whether a website was fit for purpose. This was achieved by recording the importance of a range of dimensions relating to user satisfaction with websites. For example, some studies set out to define a set of criteria for website evaluation (Adams & Cassner 2003; Cohen & Still 1999; Detlor & Lewis 2006; Gardner, Juricek & Xu 2008; Harpel-Burke 2005; Kim, Shaw & Schneider 2006; Osorio 2001), or a framework or model for website evaluation (Chung & Law 2003; Huizingh 2000; Liu & Arnett 2000). Simeon (1999) discussed the merits of using the AIPD Model (attract, inform, position, deliver) in website evaluation. The validity of developing a checklist for measuring website design success or failure was questioned by Zhang & von Dran (2000, p.1253). They stressed the importance of visitor motivations and in identifying factors that are of interest to website visitors. The value of testing only what is in scope for library staff to change was also noted (VandeCreek 2005, p.184).

Before embarking on their own evaluation many authors conducted extensive literature reviews. These provided a useful starting point for this research with respect to website usability, web guidelines and standards, website quality, task and performance related dimensions. For example, Kim, Shaw & Schneider (2003, p.9) provided a summary table of website evaluation criteria established in 22 prior studies. A visual representation of the commonality of the criteria under scrutiny can be seen in Figure 2-1. Some authors called for, or contributed to, a standard set of criterion for website evaluation and in support of benchmarking activities (Kim, Shaw & Schneider 2003, p.19; Palmer 2002, p.163). Maps of the elements investigated in other studies are presented in Appendix A.

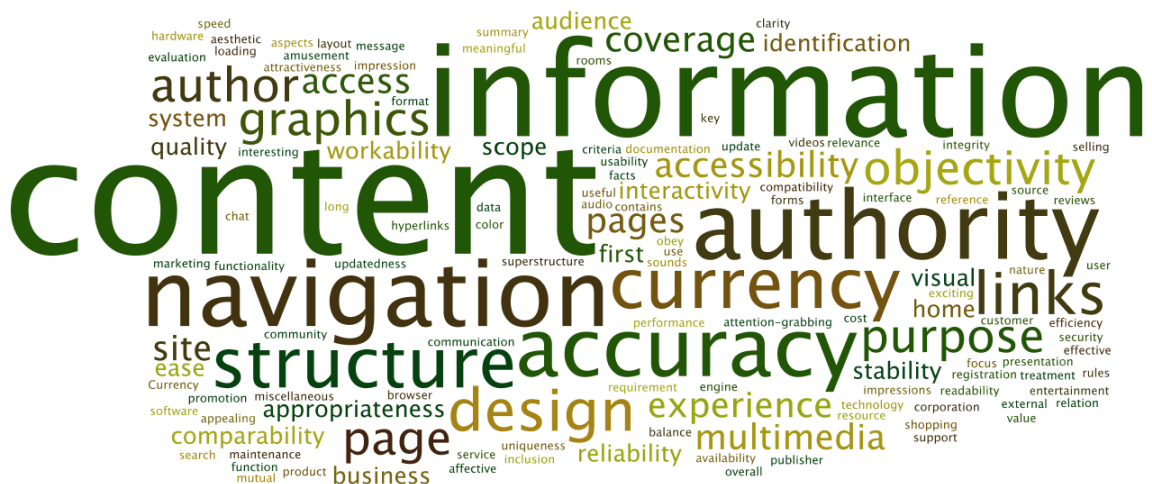


Figure 2-1: Website evaluation criteria (Derived from: Kim, Shaw & Schneider 2003, p.19)

### 2.3.1 User studies

The work of Nielsen is often referred to by researchers in the fields of Information Science and Human Computer Interactions (HCI). Nielsen's work informs the disciplines of user interface design and usability studies. Nielsen & Tahir's web guidelines have been described as being based on professional practice and experience rather than from empirical research (Brown, Rahman & Hacker 2006, p.255). The authors add that the foundation of Nielsen & Tahir's work suggested that a de facto design standard was being

derived from users' experiences of the websites they visited (Brown, Rahman & Hacker 2006, p.255).

Website effectiveness was evaluated by conducting usability testing which "involves the collection of data about how users actually interact with a product by performing a task in a given environment or work setting" (Norlin & Winters 2002, p.3). The purpose of usability testing was to identify any issues users experienced when navigating a website. Subjects tested a website by completing real tasks in a controlled environment while observers gathered information on their actions and expectations of the website. This process identified strengths and weaknesses of the website from the end user perspective which could then be used to make improvements (Norlin & Winters 2002, p.5).

Other methods of determining website usability were surveys, questionnaires, focus groups and field observation. Surveys and questionnaires provided measures of satisfaction while focus groups generated information on website use and involved a moderator. Field observation were made in the users' environment which could be distracting for participants (Norlin & Winters 2002, p.3). Pre-assessment activities, like surveys and focus groups helped to improve usability studies. Surveys were particularly useful where resources were limited, while focus groups were good for gathering in-depth information as follow up questions could be asked (Norlin & Winters 2002, pp.26-27). Limitations of usability testing related to reliability and validity (Norlin & Winters 2002, p.5).

According to Sterne (1995, p.5) there were three key elements that web designers needed to address:

1. navigation;
2. interactivity; and
3. feedback.

Initial designs may be arrived at through prototyping methods where the client outlined their requirements. A website design was then developed and this was refined through



testing and feedback mechanisms. Prototyping as a method was also applied to existing websites to arrive at a model or composite design (Osorio 2001).

Usability studies often considered website characteristics such as: design, navigation, interactivity, responsiveness, content, playfulness, security, privacy and learnability in their evaluations. Massey, Khatri & Montoya-Weiss (2007) discussed the concept of Technology Readiness (TR), the beliefs, attitudes and motivations of a user, in relation to the use and development of a website and its usability. They maintained that individual users' characteristics were not addressed in current usability research or guidelines. They made the point that:

*Overall, usability design guidelines (derived from application of theory or practice) do not prescribe which specific aspects of usability are more (less) important for different types of customers or more (less) critical for different types of online service or access methods (Massey, Khatri & Montoya-Weiss 2007, p.280).*

Developing visitor profiles can provide broad understanding of user segments and their intentions and actions when they are interacting with a website. In part, this understanding may come from the development and use of personas. A persona has been defined as “a hypothetical user archetype, developed for interface design projects and used for guiding decisions about visual design, functionality, navigation, and content” (Head 2003). These archetypes can be used to guide website design (Head 2003) but, as Massey, Khatri & Montoya-Weiss (2007, p.280) suggested, there may be scope for bringing these strands of research together. This would result in a matching of user profiles with specific usability guidelines. Although the homepage evaluation criteria developed by Nielsen & Tahir (2002, p.7) were extensive, the authors emphasised that website developers needed to evaluate the relevance of each guideline in the context of their own homepage and its visitors.

Conformance to established design and usability conventions was stressed in the literature. However, librarians appeared to be placing less emphasis on the value of

involving users in identifying the content and features that they expected to see. The strand of literature representing website content and feature analysis through checklists did not involve end users in a needs gathering exercise. Users were mentioned in relation to the following:

- the use of personas to establish typical tasks and users (Detlor & Lewis 2006, pp.254-255; Head 2003);
- adopting the use of prototyping methods as a technique for devising a common model for a library website design. Osorio (2001) suggests that the library literature does not report using prototyping in the development of its websites. This situation is changing as several studies have reported on the use of prototyping (Felker & Chung 2005; George 2005; McMullen 2001; Tolliver *et al.* 2005); and
- the necessity of ensuring that the gap in understanding that can occur between librarians and their users is removed. For the library website this is manifested in the use of jargon or library terminology (Adams & Cassner 2002, p.10; Detlor & Lewis 2006, p.255; Gardner, Juricek & Xu 2008, p.17; Hutcherson 2004, pp.349-354; Osorio 2001; Wilson 2004, p.22). Conversely, Gardner, Juricek & Grace Xu (2008, p.23) reported that the websites they investigated did present clear language.

It should be noted that the lack of information on website visitors in these papers may be a reflection of the fact that the majority focus on analysing website features and content. However, user studies do form an important element in the creation and development of a website. Although, it may be worth acknowledging that library and users' requirements may be constrained by institutional directives applicable to the library website (Harpel-Burke 2005, p.206).

Usability testing was reported to identify problems with a website and involved facilitated sessions with users completing tasks on a website with their actions being observed and noted (Griffiths 2004, p.102). Students were often recruited to undertake the completion of questions designed to simulate common information seeking tasks on

library websites (Felker & Chung 2005, pp.56-57; Holland 2005, p.32; VandeCreek 2005, p.184). The process could also include a needs assessment with information gathered by survey and user feedback (George 2005, pp.167-180). Usability testing provided valuable information on good and bad aspects of the website to inform redesign.

Felker & Chung (2005) reported on a range of methods including: log file analysis resulting in data on frequently and infrequently used pages, a staff survey which provided questions for task setting exercises, and heuristic evaluation which identified problems with website structure, page layout and help. George (2005) discussed prototyping methods used by Human-Computer Interaction (HCI) students on behalf of the library. The usability study they undertook adopted think-aloud protocols with participants verbalising their actions on a test website whilst being observed carrying out a number of tasks on that website. Through this method a prototype website was developed and later refined by library staff.

McMullen (2001) described the use of prototypes in the redesign process of an American library website. This method was used at the start of the design process and it helped to conceptualise designs onto paper before developing them with web editing software. Cognitive walkthrough followed, with librarians acting as evaluators. Further refinements to their methods and website followed in an effort to meet their users' needs. This included addressing terms used on the website and a reduction in the amount of text. One key realisation arising from their studies was that librarians did not appreciate the ways website visitors interact with their website.

Card sort technique, which was used by Cornell University library to organise concepts for a help section of the library's gateway collection of online resources, was described by Faiks & Hyland (2000). The technique was used because it was reported to be helpful in organising information (Faiks & Hyland 2000, p.350). Their research involved 12 participants drawn from under graduates, graduates and faculty staff. The process proved time consuming but it provided insights into the way that users would organise a help section and it informed library committee decisions. The research did not identify usability issues as the system itself was not studied.

Swanson & Green (2011) tested the trend of presenting library website visitors with a single 'Google like' search box, in a prominent position on the homepage, during the process of redesigning their own library's website. The decision to investigate this strategy on their own homepage arose from an observation study of over 60 library websites, coupled with a growing body of literature they observed reporting on the competition library search tools faced from Google. User expectations for a simple search tool presented librarians with a challenge in achieving this aim across their website, catalogue and subscription resources. Liu (2008, p.6) noted that there were a variety of alternative tools available to students, such as Google, which provided them with user-friendly interfaces. These were viewed as competition for library websites even though they provided access to better quality resources. During testing of their new design Swanson & Green (2011, pp.222-223) reported that users mistakenly attempted to use the single search box to meet all their requirements from the library's website.

Librarians' concerns about students' abilities to search for information were also expressed by Kesselman & Watstein (2005, pp.380-381). One view they presented was that students favoured Google Scholar over library websites because it was easier to locate and navigate compared with the range of menu options library websites featured. Searching Google Scholar was also more straightforward than library databases and results were presented in order of relevance making them readily accessible to students.

Mia & Nesta (2006, p.412) argued that Google, the company, was in direct competition with libraries as their stated mission was to organise information to make it accessible to all. They also highlighted differences in perceptions between librarians and students, as librarians were concerned with organising information by subject and offering instruction in information searching. On the other hand, students preferred to use Google to search for information as it was quick and easy to use (Mia & Nesta 2006, pp.416-417). Before featuring Google Scholar on their websites librarians were advised to have an understanding of its functionality (search engine, database or federated discovery tool). It was suggested that there was an opportunity to facilitate discussion about Google Scholar and educate students in its use (Kesselman & Watstein 2005, p.385). It was clear that

library websites were not simply search engines as they provided students with a wealth of additional information and instruction.

Data gathered from a limited number of users was often extrapolated to represent a mass audience. However, through the web it is possible to ask all website visitors for their views (Sterne 1995, pp.146-147). This standpoint has since been updated as usability studies have shown that the majority of usability issues on a website were identified in testing by five individuals (Nielsen 2000). However, web metrics and web analytics provided web developers with an opportunity to analyse composite data on website usage. Web metrics are discussed in more detail in Section 2.3.2 below.

Porter (2007, pp.126-135) outlined some novel usability methods employed in business and suggests that these methods may benefit librarians in their efforts to create usable websites. Six categories of method are defined and an example from business provided (Table 2-1).

	<b>Purpose</b>	<b>Method</b>	<b>Activities</b>	<b>Benefit to librarians</b>
Process-oriented testing  Aim: to improve visitor movement around a website and increase online bookings.	Make an online purchase (book a holiday).	Twelve participants categorised by their activities on the website ('intenders' or 'repeaters'). No other demographics.  Test time: 30-60 minutes.	Interview to gather process information about the processes involved in booking a holiday.  Real task of booking a holiday using the existing website.	Gather information about the process of student research activities.

	<b>Purpose</b>	<b>Method</b>	<b>Activities</b>	<b>Benefit to librarians</b>
<p>Side-by-side testing</p> <p>Aim: to understand customers' experiences and expectations of making an online purchase.</p>	<p>Make an online purchase (buy printer cartridges).</p>	<p>Six participants categorised by their Internet experience (novice, intermediate or experienced). Other demographics were used.</p>	<p>Prototype website tested against a competitor.</p> <p>Formal usability testing with participants completing 10 tasks and providing feedback after completion of each task. Open-ended questions asked.</p> <p>Competitor's website tested first to put participants at their ease.</p>	<p>Gain insights into students' research activities.</p> <p>Test prototype website and use this as an opportunity to educate students to the benefits of a library versus commercial website.</p> <p>Test features available on other websites with a view to incorporating in the library website.</p>
<p>Hybrid testing methods</p> <p>Aim: to test specific website features.</p>	<p>Focus on specific website features, including shopping activities</p>	<p>Group testing sessions with up to six participants (total participant numbers: 20).</p> <p>One individual usability session.</p> <p>Participant selection based on experience of level of online shopping.</p> <p>Test time: two hours.</p>	<p>Group task comprised three task scenarios with participants adopting a persona. Tasks increase in complexity to represent repeat visits to the website. Participants were presented with the scenarios through screen shots and prototype website.</p> <p>Five minute group discussion with notes made on a flip chart.</p>	<p>Group sessions are not as threatening to participants as individual test situations.</p> <p>Discussions between participants provide an opportunity to understand website use through their experience and capture their natural language.</p>

	<b>Purpose</b>	<b>Method</b>	<b>Activities</b>	<b>Benefit to librarians</b>
<p>Qualitative data gathering methods</p> <p>Aim: to inform website redesign.</p>	<p>Website redesign of a non-profit organisation by a web strategy firm.</p>	<p>Focus groups.</p> <p>One-to-one interviews in the home setting with seven participants lasting two hours each.</p> <p>Sixteen participants were asked to maintain a visual diary for a period of four days.</p>	<p>Interviews performed in a comfortable setting enquired about information searching activities, strategies for dealing with issues and daily routines.</p> <p>Diary activities included answering questions and recording experiences in text and visual forms.</p>	<p>Librarians could interview students in their halls of residence and public spaces on campus.</p> <p>Map of daily routines and where library and research activities fitted would aid understanding of student research activities.</p> <p>Gather examples of students' natural language.</p> <p>The method might appeal to students.</p>
<p>User-driven testing</p> <p>Aim: to redesign a key page on the website and to aid visitor understanding of the concept of the page to facilitate successful task completion.</p>	<p>Online buying and selling website.</p>	<p>Usability testing, online surveys and conference calls (focus group style).</p> <p>Usability metrics gathered for comparison (ease of use, time on task, assists and error rates).</p>	<p>User driven real world activities and processes completed on a prototype.</p> <p>Soft launch of page linked for existing page with user feedback through survey.</p> <p>Foster and maintain an 'open dialogue' with users throughout the development process (relationship building).</p>	<p>Involving users during a website redesign would encourage good relations between library staff and students.</p>

	<b>Purpose</b>	<b>Method</b>	<b>Activities</b>	<b>Benefit to librarians</b>
Testing satisfaction  Aim: testing satisfaction with e-commerce websites against five measures (content, accuracy, format, ease-of-use and timeliness).	Research to test satisfaction with e-commerce websites.	Task-based test involving 176 college students grouped according to level of internet experience and gender.  Participants recorded their own progress through the tasks.  A time limit of 10 minutes was allocated to each task.  Tasks were accompanied with end-user computing satisfaction instrument and intent to return survey.	Tasks were based on scenarios with participants assuming a fictitious role. A generous time allocation for task completion gave participants time to read the scenarios and think about the task and their actions on the website.  The satisfaction survey consisted of open-ended and non-direct questions. These provide qualitative information in support of the quantitative.	Having participants record their own task activities would make the process easier for librarians and would capture students' natural language.  User-satisfaction goes beyond data on task completion helping to inform website design.

*Table 2-1: Usability inspection methods (Derived from: Porter 2007, pp.126-135)*

Businesses are often concerned with building customer loyalty in their website, this can be discovered through investigating usability, reputation and satisfaction (Casaló, Flavián & Guinalú 2008, pp.328-329). Another area of concern is the quality of a website; Cox & Dale (2002) examined this dimension through available data and creation of a checklist to inform website creation or design. The WebQual survey instrument was designed for gathering user feedback on website quality dimensions. It has been used by Barnes & Vidgen (2003) to record views on a website before and after a redesign. A model for establishing the quality of a website (WQM – Web Quality Model) has been developed by Calero, Ruiz & Piattini (2005, p.229). This model comprises three categories: features, life-cycle processes and quality characteristics, being measured by in excess of 380 metrics.



### 2.3.2 Website metrics

Griffiths (2004, p.139) states that: “In order to manage your site effectively you need to know what your visitors are looking at (and what they are not).” This can be achieved by monitoring web server log files which record activity on the web server, or page tagging which records visitor activity on a website. Griffiths (2004, pp.139-140) states that web server logs provide statistical data which is compiled by software such as WebTrends, OneStat, Clickstream and Hitwise. These data offered information on visitors, where they come from and what time of day. Information could be ranked to show popular and unpopular pages with this intelligence being used to remove or improve the visibility of least viewed pages. If analysis did not provide useful insights then this effort is wasted, however:

*..... judicious use of the high level detail (particularly numbers of unique visitors and the identity of the most visited pages) can provide exactly the sort of evidence that senior managers consider to be the evidence that convinces them of the value of the organization’s web presence (Griffiths 2004, p.201).*

Web analytics as a method “..... is concerned with collecting, analyzing and interpreting web metrics” (Weischedel & Huizingh 2006, p.463). One tool used in the process is Google Analytics, it can help an organisation to understand the behaviour of visitors to its website (Tyler & Ledford 2006, p.7). There are a wide variety and number of metrics available but the choice of metrics to monitor needs to be guided by website purpose. Websites primarily focused on content, rather than e-commerce or leisure, will be interested in the time visitors spend on their website, how deep into the website they navigate and how often they return (Tyler & Ledford 2006, p.5).

According to Phippen, Sheppard & Furnell (2004, p.286) there is a need to define aims for a website so that its success can be measured. Customer experience and the relationship between customer and company are considered important factors when measuring website success. As web metrics show the relationship between the customer and the website, measures based on customers and their engagement with the website are key. For additional benefit, web metrics can be combined with other data, such as,

demographics and subscription information. They note that: “..... there is very little academic or empirical work examining how Web analytics might impact on an organisation and what benefits they might bring” (Phippen, Sheppard & Furnell 2004, p.287). Prior to this, a literature review of the use of website statistics in libraries conducted by Hightower, Sih & Tilghman (1998, p.61) showed a lack of published research in this area.

There were a number of means for measuring the performance of a website and these data could be used to inform future initiatives and website developments. However, there were areas where analysis tools were inadequate, the data they supplied was inaccurate and misleading, and within organisations staff lacked the time or skill to interpret these data (Nicholas *et al.* 1999, p.144). There was also a lack of industry standard definitions for web metrics and basic metrics could be misinterpreted (Phippen, Sheppard & Furnell 2004, p.285).

The issues with web metric data and its use were well documented. Discussions on a range of themes associated with web server log files included: a lack of agreement of terms used for describing these data, difficulties in determining the start and end point of a visitor session, the issue of caching (browser and server), defining what is being measured (hits, visits, page impressions, geographic location of a visitor), and what can be determined from the available data (Fourie & Bothman 2007; Nicholas *et al.* 1999; Nicholas, Huntington & Williams 2002; Sterne 1995, pp.229-233; Yeadon 2001). A useful starting point for organisations considering adopting web analytics was to consider the strengths and weaknesses in web tracking software. These were summarised by Fourie & Bothma (2007) who discussed some of the available web tracking software and provided criteria for its evaluation and selection. Sterne (1995, p.232) offered a note of caution when analysing server logs as these recorded computer activity rather than individual users' activity on a website.

The software available for analysing web server log files could be beneficial in providing analysts with information that was easier to examine. However, different software treated log files in a different way, the size of the file was problematic for some software, and the

software determined the information an analyst had to work with. One solution was to parse log files to remove extraneous data and then to present these data in a format suitable for statistical analysis (Nicholas *et al.* 1999, pp.149-195). This gave analysts greater control over the available data. Yeadon (2001, pp.59-60) argued that having control over the data was an important factor and one which was not available when using external statistical services. Unfortunately, this was not always an option for libraries where another department at their university had control over the web server. Memmott and deVries (2010, p.801) reported that their institution does not provide access to web server log files or any detailed statistics on website usage. In order to collect website activity data they installed Google Analytics which works via the page tagging method.

Website managers were advised by Peterson (2004, p.8) to consider website download times. This process can be started by assessing commonly used pages and access methods (modem, Integrated Services Digital Network - ISDN). The method advised for establishing a baseline is to record times for the homepage and three or four other pages. The information provided by this analysis was reported to be invaluable for improving overall download times. As Peterson related, visitors to a website are reluctant to wait too long for a page to download to their browser. A number of other authors also recommend monitoring page download speeds (Nielsen & Tahir 2002, p.39; Mistic & Johnson 1999, p.386).

Aggregate usage metrics have been described as basic and lacking in detail and are, therefore, only useful in providing general information on website usage (Nicholas, Huntington & Williams 2002, p.64). On the other hand, Yeadon (2001, p.56) reported that log analyser packages gave a useful picture of website use over time and they provided web administrators with detailed and customisable reports. This flexibility in reporting facilitated data broken down to section or page level view; it identified issues with navigation to inform the design process; and, gave intelligence used for scheduling server down time (Yeadon 2001, pp.56-57).

Web analytics was reported to help organisations improve the quality of their websites, although web metric data remained under used (Weischedel & Huizingh 2006, p.463). There were recognised limitations in these data as although they reported “when” and “what”, they provided few insights into visitors’ reasons for their actions (“how” and “why”). There were also gaps in the available data which managers needed to take into account when studying these data. Research into managers’ uses of these data to make improvements to their website were rare in the literature (Weischedel & Huizingh 2006, pp.463-464). Through a case study approach Weischedel & Huizingh (2006) revealed how metric data and customer interview data were used by managers of a US IT Company to improve their website. The company was selected because of their commitment to using and resourcing web metrics. Eight employees involved in various activities associated with web metric use were interviewed and documents and metric information were analysed. Findings were divided into themes: use of web metrics, limitations and overcoming these limitations. They identified a range of data uses including analysis of website search queries, clickthrough rates and referrals from other websites, and browser use to inform redesign. In addition, traffic was monitored following a page change to see how user behaviour was affected and they prioritised tasks their visitors performed most often. Metric and survey data were combined to provide a more complete picture of website use. Metrics were valued because they informed on website activity whereas website users might report their actions differently in surveys. Metrics added a qualitative dimension to website analysis enabling the measuring of change and objectives. This included having measures that were not previously available, such as evaluating marketing campaigns. One limitation was data overload, although company managers mitigated against this by linking metrics to objectives associated with self-help, customer service or sales. Other concerns were lack of industry standards, web metric training for staff, selecting metrics and interpreting data. Limitations were overcome by careful selection of metrics and clearly defined objectives and triangulation of data to bring in demographics, usability testing, and competitive intelligence via rankings and reports from web analytics vendors. Thus, qualitative data added meaning to quantitative data which aided interpretation of the statistics. This concept is illustrated in the following phrase:

*The managers [interviewed] expressed a need for blending in qualitative data, meaning the need for a methodology that can create a picture of a web experience from both a quantitative and qualitative standpoint (Weischedel & Huizingh 2006, p.468).*

This research, although concerning company web metric use, highlighted some of the benefits and pitfalls in adopting web analytics to improve website usage. A methodology for blending qualitative and quantitative website usage data, if generic, could be applied to academic websites.

As identified in Weischedel & Huizingh (2006), goals need to be set to measure the success of a website's design. These goals should be "reasonable, achievable, and measurable" (Sterne 1995, p.5). One reason librarians were encouraged to engage with website evaluation was that "without detailed and comprehensive use data many strategic questions cannot be answered until, perhaps, too late" (Nicholas *et al.* 1999, p.144). A metric is created to answer a question from management and its use is strategic. It is, therefore, important to define key performance indicators and to be clear about what is required so that the right metric is used to provide meaningful data. In this way data will provide a pertinent answer to the question posed leading to the creation of a purposeful solution. This approach also avoids wasting valuable time and money in collecting and analysing data that will not provide useful information (Klubeck, Langthorne & Padget 2006, pp.56-57). The authors suggested devising an implementation plan to guide metric creation, purpose and use through the following details:

- define metric;
- outline its purpose;
- state who it will be useful to;
- provide a visualisation of the 'story' the metric data will tell;
- outline the 'story' itself and how it answers the original question;
- define when data collection will begin and end;
- define the data to be collected and method of collection;
- define the method of analysis;

- set out the benchmarks to work towards and to measure against; and
- record lessons learned along the way (Klubeck, Langthorne & Padgett 2006, pp.57-58).

The authors concluded that metrics are “indicators to help answer a question” and therefore require careful analysis and use (Klubeck, Langthorne & Padgett 2006, p.58).

WebTrends server log analyser was used by Xue (2004) to assess website usage of government publications on a library website. The main drawbacks in this study were that the filtering of web crawler activity was not activated on their installation of WebTrends, there was no way to assess the level of usage of cached webpages, and that data on visitor segments were not discernable (Xue 2004, pp.182-183 and p.189). Despite these failings, the study revealed levels of usage; search engine referrals and search phrases; and the success of their subject directory (Xue 2004, pp.188-189). Another library study involving analysis of web server log file was conducted by Manduca, Iverson & Fox (2005). They used Sawmill to evaluate use of their digital library. They also recognised the drawbacks of log file data but their analysis enabled them to reconstruct users' activity. In addition to server log file analysis, they also took part in a web metrics pilot study conducted by the National Science Digital Library (NSDL). This involved tagging pages with JavaScript, thus avoiding caching problems associated with web server logs. Both methods revealed similar usage patterns. As expected, users typically found the digital library through a search on Google. Their arrival at the library was driven by the search for geoscience information. Visitors often arrived at a point deep within the website, bypassing the homepage. The website was designed to encourage upward navigation to their pedagogic materials and this was confirmed by the metric data. An experiment using banner advertisements to drive online requests for DVD or videotape purchases and online renewals of loan items was reported by Whang (2007, pp.98-103). Although the results of this experiment were mixed, requests increased while renewals decreased, it suggested a method whereby web managers can monitor and attempt to increase their web-conversion rates. The author notes that a single web server was used in this experiment (Whang 2007, p.104); however, no additional details on the methodology for obtaining the web metric data were provided. Following a study of their website log

files Asunka *et al.* (2009, p.44) concluded that the primary reason for visiting their library's website was to access scholarly materials and that visits remain high throughout the year.

Web server log file analysis can also provide insights into the use of a particular feature on a library website. An example of this was reported by Ghaphery (2005) who studied use of the quick links section on their website. Analysis of the logs indicated that visitors were not always successful in their use of the dropdown menu choices. In these cases visitors clicked the button to go to a webpage without selecting which page they wanted from the list (Ghaphery 2005, p.152). Thus web design choices and decisions about access to subscription resources can be guided by studying usage data (Ghaphery 2005, p.155).

Website statistics from server log files are a useful addition to a library's statistical report offerings and illustrate the ways in which a library supports its university's mission. It illuminates frequently accessed pages for locating resources, library information and services. These data provided evidence of professional activities, could be used to inform website design (placement and prominence of links) and as justification for staff time in creating library webpages (Welch 2005a, pp.375-378).

A study of the State Library of Victoria was undertaken to improve librarians' knowledge of the content being accessed on their website. Data were provided by Hitwise, WebTrends and Google Analytics although the focus of the research was intelligence provided by Hitwise. These data are network centric and cover more than a third of Australian Internet subscriptions. It was also combined with lifestyle data resulting in visitor profiles. The reported benefits of these data are that demographic data are included, web crawler activity are excluded, it is a non-invasive method, data from a large number of website visitors are gathered and it is a low cost solution. Its disadvantage is that it only includes a sample of their website usage, albeit a representative sample. Although the author notes that Google Analytics could have provided the data required for their research, it was not a practical option for analysing all their pages as their website contains hundreds of thousands of individual pages and only a

subset of these pages are tagged with Google Analytics code. Their analysis provided them with information about website activity, where visitors came from and where they go to from the website. Other limitations in their data were that it did not distinguish between search and browse visitors and did not reveal whether visitors found information to meet their needs (Waller 2009).

When considering web analytics Cutler & Sterne (2000, p.3) noted that it was a relatively new discipline and many e-businesses were struggling with the concepts in the belief that there is value in these data. Despite this Palmer (2002, p.152) believed that “Metrics help organizations generate more effective Web sites and provide measures that managers understand and that academics can replicate and analyze.” There was also a lack of library literature offering advice on using usage data to make website improvements (Arendt & Wagner 2010).

Website statistics, as evidence of website use and as a tool to leverage a prominent link to a library from its university homepage, were recorded as early as 1997. McCready (1997, p.89) documented this as a positive outcome of the popularity of Marquette University libraries’ website as recorded in statistics.

Librarians are concerned with benchmarking their library’s services against others and Hightower, Sih & Tilghman (1998) designed a benchmarking program to compare library website statistics. The authors compared data from 14 universities’ science and engineering libraries to derive common metrics and guidelines on how to collect and analyse these data. They discussed the importance of defining a set of criterion to provide a framework for comparison and reducing the variables between websites to ensure more meaningful data collection. They noted that benchmarking requires standards for measures as well as methods for reporting on data measures, their collection and interpretation. As raw data were contributed from libraries in the study, the authors were able to apply the same software process and analysis to all data (Hightower, Sih & Tilghman 1998, p.65). Despite this they encountered a number of methodological problems including: getting the log files before they were overwritten by institutions web servers, file sizes were extremely large and required time to gather, disc space for storage



was required and processing power needed to analyse the log files (Hightower, Sih & Tilghman 1998, pp.65-66). At the time of this research, there was very little practical application for the statistics gathered in the libraries studied. Data was recorded but not analysed and was therefore not actionable, for example, it was not used to make decisions about staff time allocated for maintenance and development of the website (Hightower, Sih & Tilghman 1998, pp.75-76). The authors concluded with seven recommendations for benchmarking library websites:

1. select libraries for comparison;
2. use page requests for comparison (remove multimedia files and error messages from totals);
3. exclude data-rich media files, library catalogue and commercial products;
4. page requests sorted by categories and reported monthly;
5. for comparison, data sorted by shared website characteristics;
6. to facilitate benchmarking a formal reporting structure is required; and
7. ARL Office of Statistics to provide central coordination (Hightower, Sih & Tilghman 1998, p.77).

Reports on the use of web analytics by university librarians are rare, perhaps an indicator that use of web analytic tools represents a new development to this group. An early study by Li (1999) used page tagging to analyse website usability and the impact of advertising on website usage. This research showed that the website was accessible to most visitors and that usage increased following an advertising campaign. Improvements suggested by the data related to designing for all visitors technologies, refreshing content and maintaining promotion efforts (Li 1999, pp.158-159). A later report by Fang (2007) detailed the use of Google Analytics to track visitor behaviour during a project to improve the content and design of Rutgers-Newark Law Library. Google Analytics was used to compare search terms, view visual summaries of website activity, see trends, analyse funnel navigation, identify popular pages, look at link counts on a representation of the website using the website overlay and study visitor segments. Fang reported that Google Analytics was easy to install and the visual reporting tools were well received as they made complex data easy to understand. Using Google Analytics provided them with

valuable data on their users technical set-up and under-used content on their website. However, Google Analytics did not offer suggestions for ways to improve content and design based on the data. Therefore, data needs interpreting before action can be taken to address issues. To overcome this, the Digital Services Librarian interpreted the data and provided information for discussion with reference to librarians and administrators. Comments were transformed into suggested changes, these were then discussed and their administrators decided which aspects of their website would be amended. This detailed case study provides evidence of Google Analytics informing website design and content as well as the processes involved in these activities.

#### *2.4 Advantages and disadvantages of library website user study methods*

The library literature contained valuable information on the advantages and disadvantages of website user study methods, but this information was dispersed within the text on website redesign projects. This summary and in-depth listing in Appendix B provide a valuable synthesis of library web managers and librarians adopted methods and experiences. This confirmed practices and experiences across the sector and introduced new methods or approaches for investigation.

Felker & Chung (2005, p.57) reported that a mix of methods confirmed findings across each method, and provided a more comprehensive understanding of website usage. Another example of this was provided by Black (2009, p.7 and pp12-13) who noted that web server logs record machine to machine activity and analysis needed to be combined with user studies to ensure user motivations are fully understood. Thus the weakness of one method was counteracted by the strength of another.

Several authors noted the value of calling on the services of an expert in web design or usability. There were benefits to be gained from a consultant's wider knowledge and experience of usability issues, as well as having an unbiased input into the website redesign process (Tolliver *et al.* 2005, p.165). However, library staff had considerable knowledge about their website users' requirements and their website content (Tolliver *et*

*al.* 2005, p.165). In addition, Porter (2007, p.127) suggested that librarians could learn from usability methods employed in the commercial sector.

Thompson (2003) summarised the advantages and disadvantages of remote observation strategies and equipment from experience of using this method to inform library website redesign. Although there were some issues with installing recording software, remote access, cost, time required to undertake analysis, and lack of behavioural information, there were benefits to this method. These included unobtrusive recording of sessions which were then available for analysis at a later date. Swanson and Green (2011, p.225) reported difficulties with students not turning up for sessions they agreed to attend. They also acknowledged that participants were a convenience sample and not representative in terms of gender and area of study. In addition, the artificial nature of the test session and the effect this had on participants was noted. Despite these issues they gained insights into their users' actions on their website and that, contrary to their observation following review of peer websites prior to their usability studies, a prominent search in the centre of their homepage did not make their website more user friendly for their users (Swanson and Green 2011, p.227).

Harley and Henke (2007) compared the use of surveys and transaction log analysis based on their experiences. An important insight from their case study was that neither of these methods captured the views or activities of individuals who do not use library websites. They stress the value of incorporating non-users into the planning and development process.

The process of conducting usability studies highlighted a need for a formal instrument to guide the process (McMullen 2001, p.14). A key concern was designing for website users rather than information professionals; achieving this required an understanding of library website users, terms and navigation choices (McGillis & Toms 2001, p.366; McMullen 2001, p.16).

## 2.5 *Conclusions*

Although there are a plethora of studies reporting individual library website redesign projects, the literature review highlighted a shortage of information on UK library website management. Studies provided insights into the website redesign process including internal project planning and application as well as website users' views on the existing or redesigned website through user studies. However, there was a tendency to focus on examination of individual library websites, rather than a sector wide view. There was also a strong bias towards reporting the experience of American and Canadian libraries.

In relation to common content and design of library websites, studies focused on analysis of homepage content and features. These analyses were undertaken by completion of a checklist of content, features and novel elements or new technologies identified on library website homepages. This approach proved to be an effective way of evaluating websites and enabled comparison across existing studies and bringing new studies in-line with existing knowledge. An on-going concern with library sector websites related to poor design quality (Tolppanena, Millerb & Wooden 2000) However, Harpel-Burke (2002) found that library websites compared favourably to company websites when compared to Nielsen & Tahir's (2002) analysis of homepage designs. A mismatch in understanding of terms used to describe library services and resources leading to navigation issues also featured (Harpel-Burke 2002; McMullen 2001). Use of new technologies and personalisation features on library websites were regarded as being under-used. These papers informed Objectives 1a. and 1b. of this research by contributing to the creation of a checklist of content and features against which UK library website homepages were recorded. Adopting some of the features and content previously studied allowed for cross-comparison.

As a core element in advertising and delivering services and resources to a range of stakeholders (university managers, faculty, students, researchers, potential students and members of the public), effective management and development are crucial. Research into website management was given context where library mission and strategy were discussed. A greater cultural driver for devising and advertising library mission

statements was evident in US and Canadian studies. In the UK this area received little attention except for Brophy (1991) who accepted that UK academic libraries were less likely to have a mission statement than their counterparts in the US. However, a mission was recognised as an effective way to communicate with stakeholders. Further evidence was derived from the strategic planning processes and documents.

Website management through web groups or committees predominated with web teams taking an active role in the decision making process. Early surveys highlighted the prevalence of self-taught volunteer library web workers. Librarians contributed a range of diverse skills to website creation, content and development. Project management and effective communication skills were both highlighted as important for successful website delivery. Later articles reported that matching or developing skills to the available web work were more profitable approaches to achieving completion of that work than a volunteer workforce. Areas where improvements could be made included updating skill sets, facilitating additional time and resourcing for website duties, allocating web managers more authority to push web work through, greater attention to strategies for improving website design and usability, and formalising approaches to website development.

Library websites were delivered within the context of a wider organisational unit and this had a bearing on the systems and website design available to library web managers. Use of a university content management system and website template featured in a limited number of studies. Advantages and disadvantages for library website delivery were highlighted and balanced by library website managers' presence on their university's web group. Cox & Emmott (2007) provided valuable insights into UK university web managers' experiences and issues in managing a corporate website. A national survey of UK university library web managers and case studies, involving a range of library staff, revealed current practice in these areas to achieve research Objective 2.

Creating a vibrant and usable website to engage and instruct users in the face of competition from other resources on the Web is not an easy task. Library website user demographics varied but gathering feedback to inform website development, or canvas

opinions on a new website design were undertaken through a variety of formal and informal methods. Barriers to undertaking user studies included available time, skills and methodological issues. Some of these problems were addressed in Porter's (2007) suggestion for adapting treatments used in the business sector to libraries. Research Objective 3 addressed these issues via data collected from national survey and case studies.

In summary, literature reporting the experience of web managers in UK university libraries followed a case study approach. Descriptive reports of past redesign project approaches, project management and staff responsibilities, and user input into website redesign predominated. Broader studies evaluating practice across the sector covering website strategies, management and the impact of university website management on library practices were rare. Thus, in the UK environment institutional drivers and environment seem to be underplayed in the literature and the tendency to a case based approach highlights a lack of knowledge of the national perspective.

This research built on existing studies to provide valuable insights into UK library sector wide website content, management and development. An analysis of UK university library website content and features had not previously been undertaken. This research filled the gap through evaluation against a checklist of features using prior studies feature lists as a starting point. Library website management and development activities were revealed through a national survey of UK university library website managers. In addition, case studies presented a more detailed localised view of library staff experiences of managing and developing their library's website. As the institutional influence is under reported, this research highlighted web managers' experiences of maintaining and developing their website within the university setting. The scope of adoption of web analytics and how website activity data were gathered and used to inform development was missing from the literature. This information was gathered by analysing these websites' code for evidence of web analytic software adoption, via questions in the national survey and case studies. These data were then synthesised into a website organisational framework (Objective 4) representing library website management and development practice in the context of the institutional setting.

The following chapter discusses the methodological framework for this research, and addresses methods used to gather and analyse appropriate data to address its objectives.

## Chapter 3      Research Methodology

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### *3.0 Introduction*

This chapter sets out the research philosophy, design and methods adopted to achieve the research aims and objectives. The purpose of the research was to provide a greater understanding of the ways UK university library websites are managed and developed. The need for this research was identified in the literature review. Significant gaps in a number of areas relating to the content, management and development of UK university library websites were revealed. The gaps informed the development of the specific objectives for this research. The literature review also highlighted methods used in prior studies of website management and development. Included was the adoption of a checklist to analyse content and features of a website; a survey for gathering views from a wide group of practitioners on the topic; and, case studies for detailed views of events within a library or small number of libraries. Based on these prior studies, the proposed methods for achieving the research objectives are outlined in Section 3.0.1. In addition, a mapping of research objectives, methods and thesis chapters is provided in Figure 3-1. The appropriateness and validity of these methods for this research are examined in this chapter.

#### *3.0.1 Research objectives*

Objective 1a. To conduct a literature review to establish website design recommendations and standard characteristics of university library websites.

The extant literature was scanned for website design guidelines and library website content analyses. A list of appropriate design guidelines and website characteristics (content and features) was compiled for comparison with UK university library websites.



Objective 1b. To analyse the content of UK university library websites to establish core characteristics and compliance with usability design guidelines.

The objective was achieved through document analysis of UK university library websites to establish usability design features, core content and features of UK university library websites and adoption of web analytic tools via website code inspection. Prior website content studies achieved analysis via a checklist of elements. The same approach was adopted in this examination of UK university library websites.

Objective 2. To record and analyse UK university library website management and development practices, including strategic dimensions.

This was achieved through a national survey of UK university library website managers and case studies. The survey involved an online questionnaire and interviews and presented an overview of the national position. Case studies were more suited to gathering in-depth information on a smaller number of examples. The combination of these two methods provided a comprehensive picture of UK university library website management and development activities.

The analysis of website code to establish the uptake of web analytic software in UK university libraries complemented data gathered through national survey, as well as providing information on adoption by a greater number of UK university libraries.

Objective 3. To evaluate the advantages and disadvantages of the methods used for establishing UK university library website effectiveness.

Prior studies provided information on the benefits and drawbacks of the methods that librarians used to gather feedback from their website users. Although these studies provided a wealth of information there was a lack of literature addressing the experience of UK university librarians. Therefore, the prior literature was used to provide a comparison for the data gathered via national survey and case studies from UK university libraries. In addition, as web analytics was a relatively new method it had not been

reported in relation to UK university libraries. Therefore, analysis of the advantages and disadvantages of this method added a new dimension to the extant literature.

Objective 4. To identify and describe the factors required for effective management and development of UK university library websites, and to construct a framework around these factors.

Data gathered through literature review, website content analysis, national survey and case studies was analysed to inform the design of a framework for successful management and development of UK university library websites.

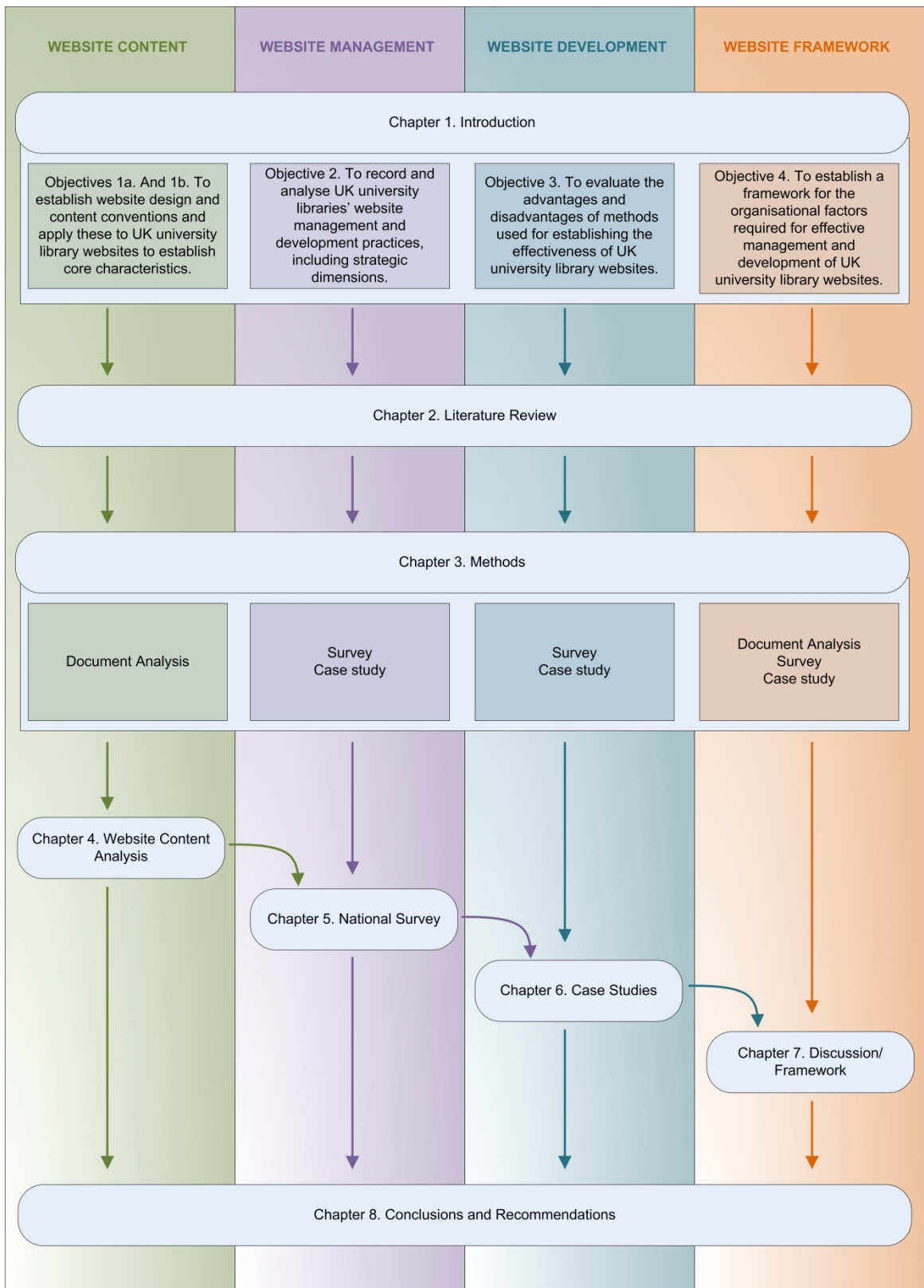


Figure 3-1: Map of research objectives, methods and thesis chapters

The remainder of this chapter is divided into two sections; the first discusses research design and implementation. This encompasses philosophy, paradigms, methodologies, strategies, and data collection and analysis. The second section presents the research techniques deemed appropriate for the research to achieve its aims and objectives. This includes the research approach, strategy, methodology, and data collection and analysis.

### *3.1 Research philosophy and paradigm*

The world can be understood from different perspectives: philosophical, religious and cultural (Allison 2001, p.7). Every researcher brings their own perspective of the world to their research activities (Creswell 2007, p.15). Brewer (2007) described two principal research paradigms:

- positivism: is concerned with facts and events which are observable. Experiment is the preferred research method although survey and existing statistics can be used where experiment is not possible; and
- interpretivism: is concerned with describing and classifying phenomena. Qualitative data are gathered from interviews and case studies.

Positivism is a scientific method, dealing with facts and observable phenomena. The aim of this approach is to describe and explain phenomena and to generalise, predict events or formulate laws (Allison 2001, pp.7-8). It is valued because studies can be replicated and in this way knowledge is tested and confirmed (Neuman 2007, p.42). Conversely, interpretivism is associated with social science and it sets out to describe and classify phenomena. Events are believed to be unique, being governed by a number of variables, and they are studied in their natural setting. The researcher acts as an observer with research questions arising from the process of enquiry. Due to the unique nature of phenomena, generalisations are not possible (Allison 2001, pp.7-9). Whereas, adding to knowledge by gaining an understanding of phenomena rather than replication to test knowledge is valued (Neuman 2007, p.44). Positivism (quantitative foundation) and interpretivism (qualitative foundation) have traditionally been viewed as opposing standpoints. However, Allison (2001, p.9) believed that they were not in opposition,

rather that there exists a degree of overlap in the different methods, such that they complement one another. This view was also supported by Walliman (2006, p.20) who noted that these approaches to research need not be used in isolation.

The foundation of a third paradigm, pragmatism, also regards positivism and interpretivism as being compatible.

- Pragmatism: rejection of a single standpoint on quantitative or qualitative data in favour of an approach where research questions drive the selection of method for gathering data. Quantitative and qualitative evidence are equally valid.

Through the pragmatic standpoint it is the research problem being addressed that guides the selection of methods, rather than favouring one theoretical standpoint over another (Denscombe 2007, pp.108-109).

### *3.2 Research methodology*

#### *3.2.1 Qualitative methodology*

Qualitative research is classified as scientific research as it begins with a research problem, involves a literature review, defines research questions, gathers and analyses data, and a research report written (Creswell 2007, pp.41-42). It begins with assumptions about phenomena and through the research process an understanding of how individuals perceive their situation and react to it is established. It is a close study taking in complex interactions in a given situation (Creswell 2007, p.37). Qualitative methodology is used for exploring issues to gain an understanding of the factors involved and the interplay between people and places. It involves primary research processes where a researcher develops their own research protocol rather than relying on instruments developed and used elsewhere. It is used where no prior theory exists, or where the theory does not adequately describe the issue under investigation. It is useful where quantitative data is not able to provide answers to the problem being addressed (Creswell 2007, p.40).

Although a literature review is undertaken it may only play a small part in the research process in that it identifies the research purpose and the problem to be addressed. It is not used to guide research questions as the researcher must remain open to participants' views and experiences. The primary purpose of qualitative research is to understand a situation from the experiences of those involved. It takes a holistic view of a phenomenon with factors being interlinked and studied in context. For this reason participant numbers are limited. Researchers gather data from a number of sources (interviews, observation and documentary evidence) using open-ended questions so that detailed data are provided. Data are analysed according to an inductive approach ('bottom-up') with texts being coded to aid identification of patterns or themes. Although sources of data may result in qualitative and quantitative data, analyses are concerned with describing these data. The researcher interprets their own observations and data gathered and thus their experiences and biases are stated in the report as this shapes their interpretation of data collected. Validity is assured through involving participants in checking themes and the case report and in the use of multiple data sources (triangulation). The research process and design are not fixed, they are adjusted in reaction to the data (Creswell 2007, pp.37-39; Creswell & Plano Clark 2007, pp.28-31; Denscombe 2007, pp.249-250).

One of the strengths of this methodology is that it uncovers core issues, the motivations and connections between elements studied. However, there is an inherent weakness in any research focusing on a small number of individuals or cases. That being, generalisation to the wider population is not possible (Hakim 1992, pp.27-28).

### *3.2.2 Quantitative methodology*

Quantitative methodology is a scientific approach where the research design is established at the beginning of the research process, research questions are devised through hypotheses and methods are determined prior to data gathering. Quantitative research is concerned with measuring phenomena and is therefore focused on numbers as units of analysis. A review of the literature is an important aspect of quantitative research as it establishes the research problem and identifies theories or questions to be addressed. Specific data (numbers or scores) to test these theories and questions are derived from

standard instruments, checklists or available documents. Large-scale research studies are required to improve the reliability of the findings. Instruments used for data gathering include checklists and schedules. This approach is adopted to ensure that researcher objectivity is maintained throughout. Data are analysed through measurable comparison and correlation. Through these statistical procedures, numbers and scores are analysed with the purpose of confirming or rejecting hypotheses to establish theories based on evidence gathered. The researcher is removed from the process to reduce the introduction of bias in the process and validity is assured by the weight of evidence in support of their interpretation of the research results (Allison 2001, p.15; Creswell & Plano Clarke 2007, pp.28-31; Denscombe 2007, pp.248-250).

The focus of quantitative research is very specific and involves comparison of variables. These variables are taken out of their original context so that the researcher is able to study the nature of their influences upon one another (Denscombe 2007, p.249).

### *3.3 Research approach*

Research falls into one of two approaches, deductive ('top-down') or inductive ('bottom-up'). Deductive research moves from the general to the specific, whereas inductive research moves from specific observations to broader generalisations or theories:

- deductive: begins with theories, hypotheses, or observations then moves to confirmation or rejection of these assumptions through empirical data; and
- inductive: observations, patterns, tentative hypotheses leading to theories (Neuman 2007, pp.29-30).

A deductive approach is used to test the validity of emerging categories, properties and hypotheses. The researcher analyses their data to find out whether there is sufficient evidence in support of their assertions. Elements not validated through these processes are discarded. An inductive approach derives theories from the data via categories, properties and hypotheses:

*.... hypotheses emerge simultaneously with the collection and analysis of data. The researcher tries to support tentative hypotheses while at the same time remaining open to the emergence of new hypotheses (Merriam 1998, p.191).*

Through this process theories emerge guiding further data collection and analysis. Case studies fall into the inductive research category, which is exploratory and descriptive. Therefore, they are not used to test hypotheses as in deductive strategies. These approaches can be viewed as opposite ends of a spectrum and are seldom used in isolation. Thus a third approach, the hypothetico-deductive method, is adopted to enable researchers to employ both processes where theories lead to observations, which in turn lead to identification of new patterns leading to the development of new theories (Walliman 2006, pp.16-27).

Hakim (1992, p.10) asserts that research design should address the research issues or questions, prior research and knowledge of the topic. It should also take into account resource availability, staff time and staff skills required to undertake the investigation.

### *3.4 Research strategies*

*Strategies are broad approaches to research that are concerned with the direction and scale of a research project and its underlying philosophy. Strategies involve the aims and design principles that shape the overall investigation (Denscombe 2007, p.332).*

#### *3.4.1 Mixed method*

Mixed method is a scientific method where specific approaches are adopted for their 'fit' with the particular research problem being addressed and its ability to provide answers to the research questions. Knowledge is acquired and tested through empirical enquiry. That knowledge is transitional being based in the context of its setting at the time of enquiry (Denscombe 2007, pp.116-117).



*Mixed methods research is a research design with philosophical assumptions as well as methods of enquiry. As a methodology, it involves collection and analysis of data and the mixture of qualitative and quantitative approaches in many phases of the research process. As a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides better understanding of research problems than either approach alone (Creswell & Plano Clark 2007, p.5).*

Mixed method is adopted by researchers to improve the accuracy of their findings through the use of different methods. It can also be used to develop research instruments, for example, focus groups conducted to guide development of a questionnaire (Denscombe 2007, pp109-110).

Mixed method involves collecting and analysing qualitative and quantitative data. The process must lead to a better understanding of the research problem beyond that which is gained by the use of either method in isolation. Data are brought together through a number of ways (triangulation):

- merging: two data sets are brought together in the research results;
- connecting: one data set builds on another; and
- embedding: one data set is embedded in another and provides a supporting role (Creswell & Plano Clark 2007, p.7).

Key benefits to adopting a mixed methods approach are:

- the strengths in one method balance the weaknesses in another;
- comprehensive evidence is gathered to address a research problem;
- individual data sets expand or explain one another;
- enquiry across paradigms and the qualitative/quantitative divide are encouraged; and

- it is a practical approach because a range of methods are available to researchers.

For example, inductive and deductive thinking can be used as well as words and numbers. This makes for a more complete picture of reality and a more persuasive argument (Creswell & Plano 2007, pp.9-10).

Along with the benefits of a mixed method approach, there are challenges for researchers:

- data collection and analyses are time consuming;
- research procedures are complicated;
- presentation of the data needs to be clear for the reader; and
- researchers have to be able to conduct qualitative and quantitative methods (Creswell & Plano 2007, p.10).

### *3.4.2 Survey*

Survey research is a strategy involving a number of methods. It is “an approach in which there is empirical research pertaining to a given point in time which aims to incorporate as wide and as inclusive data as possible” (Denscombe 2007, pp.7-8). Thus, surveys gather data to measure or record real events.

Fowler (2009, p.11) believes that “the purpose of a survey is to provide statistical estimates of the characteristics of a target population”. For this enquiry to be effective respondents have to mirror the target population and their answers must provide an accurate measure of the characteristics under investigation (Fowler 2009, p.12). Therefore, the sample selected for investigation has to be representative of the target population. There are two areas where this may not be achieved:

- sampling errors: random differences in the sample can result in one that does not mirror the population. (Fowler 2009, pp.13-14); and
- bias: can be introduced where survey respondents are intrinsically different to the population. This form of error is introduced as a result of the design or execution

of the survey and leads to inaccurate generalisations to the whole population. It can be minimised by careful selection of the '*sample frame*' so as not to exclude any particular variable and random selection of individuals in the sample (this is important as the profile of volunteers is likely to differ from non-volunteers). Non-responses may also introduce an element of bias. (Fowler 2009, pp.13-14).

A sample which effectively represents the wider population is known as a probability sample. One that does not carry this association is a non-probability sample (Denscombe 2007, p.13).

Survey types might encompass: postal, Internet, face to face interview, telephone interview, document analyses and observation (Denscombe 2007, pp.8-12). There are acknowledged differences between methods of administering questionnaires. As far as honesty in responses is concerned, distance between researchers and respondents plays a part where questions are likely to cause embarrassment to the respondent. Thus, postal questionnaires are preferred over face-to-face interviews in these situations. There is a trade-off though as researchers have less control over situations where questionnaires are completed outside of the sphere of their influence (Gomm 2004, p.157).

Survey question formats may be closed or open ended. Both types have advantages and disadvantages for the researcher. Closed questions are usually preferred because they facilitate comparison as all respondents receive the same questions and the same limited options for their responses. They can be used to collect data from a large sample in a limited time-scale and they are easy for the researcher to code for analysis. It is possible to make use of scales, such as the Likert scale, as a gauge of strength of opinion. Questions need to be phrased carefully to avoid ambiguity. For example, expert terms may not be understood by the study population. Researchers have a number of options for ensuring their survey instrument will be understood:

- trialling questions before releasing to the population;
- using open-ended questions to gather phrases used by the intended audience; and
- using different versions of the same question.

In addition, unstructured interviews or focus groups can provide a starting point for development of a survey instrument (Gomm 2004, pp.162-163). Leading questions also present problems, although Gomm (2004, p.164) asserts that all questions can be viewed as leading because they direct respondents to provide answers to questions. The important factor is whether phrasing leads respondents to answer truthfully. Phrasing questions in a negative or positive way can lead to different results. Issues may arise when comparisons are made across surveys presenting questions in different ways (Gomm 2004, pp.164-165). The closed question format has also been criticised for leading respondents to lines of reasoning that may not reflect their experience. It might also force them to use terms they would not necessarily adopt. In addition, a larger sample size is required for effective use of scalar questions (Gomm 2004, p.158-161). Open-ended questions provide an opportunity for respondents to express their views in their own way. However, they can be difficult to analyse as the researcher may misinterpret terms used, in addition, themes may not be easy to detect or classify (Gomm 2004, p.160).

One of the strengths of survey research is its transparency as the methods and procedures used are available for inspections and evaluation. One of its weaknesses is that it delivers less depth of information than other methods (Hakim 1992, pp.48-49).

### *3.4.3 Case study*

A case study is defined as “an empirical inquiry that investigates a contemporary phenomenon in-depth and within its real-life context” (Yin 2009, p.18). It is used to contribute to the knowledge in a specific area, taking related phenomena into consideration (Yin 2009, p.4). In case study a researcher focuses on in-depth investigation into a single or limited number of cases. This depth view provides insights from a range of perspectives relating to the inter-play between individuals, processes and factors within a case (Denscombe 2007, pp.35-36).

Case studies are particularly good for answering ‘*how*’ and ‘*why*’ questions relating to current events where the researcher is an observer to the process (Yin 2009, pp.8-9). Direct observation, systematic interviewing and the consultation of a range of documents

and artefacts all form part of case study research (Yin 2009, p.11). The ability to utilise a range of data sources and methods within case study is one of its key benefits over other research strategies. Documentary evidence, interviews and questionnaires are all valid forms of evidence. Data are gathered following an inductive approach and information from analysis is used to explain situations. However, case study has also been used to test theories using a deductive approach. Although data are gathered from a number of methods, case study is more closely aligned to qualitative than quantitative research (Denscombe 2007, p.37-38). Bryman (2008, p.53) expressed a different view, stating that case studies frequently involve qualitative and quantitative approaches to data gathering and analyses.

Case studies have been criticised for a number of reasons with a major concern being lack of rigour in the research process. Brewer (2007, p.38) noted the importance of developing a structured research framework and cautioned against generalisation based on a small number of cases. Researcher bias influences the data collection process and, in turn, the findings and conclusions (Brewer 2007, p.38). However, there are methodologies available to aid the research process and researcher bias can also be introduced into other methods, such as experiments and surveys (Yin 2009, p.14). Yin (2009, pp.15-16) identified a number of other issues with case studies:

- case studies cannot be generalised to the wider population;
- case studies take too long to perform and lead to the creation of lengthy narrative reporting; and
- unlike randomized field trials, case studies are not designed to establish causal relationships.

These limitations are countered by the following arguments:

- case studies, like experiments, can be generalised to theoretical positions;
- case studies should not be confused with ethnographic studies where extended periods of observation in the field are required. In fact, they can be conducted within a short time period. Writing up a case study can also be effectively achieved without resorting to lengthy narrative texts; and
- despite their limitations in revealing causal relationships, case studies can add valuable contextual information to explain ‘*how*’ and ‘*why*’ a phenomenon occurs (Yin 2009, pp.15-16).

Other strategies for addressing the issue of generalisation from case studies are to conduct multiple case studies, adopt a team research approach so that a number of cases can be studied or use a typical case having a particular set of characteristics to provide the focus. In the latter example, an alternative view would be to study an outlier having different characteristics from other like cases (Bryman 1988, pp.87-90).

The research protocol sets out the instrument to be used as well as the procedures and rules to be followed during the study. The benefits to the research process are that of increased reliability in the case study process (Yin 2009, p.79).

### 3.5 *Data collection methods*

Denscombe (2007, p.133) described the four main data collection methods in the social sciences as being: questionnaires, interviews, documents and observations.

*Research methods are tools used for the collection of empirical data. They are the means by which the researcher collects or produces different kinds of data (Denscombe 2007, p.332).*

The research strategy selected dictates data gathering methods, for example, questionnaires are used in survey research while observation is conducted in ethnographic research. However, within any research strategy it is possible to utilise a range of methods as appropriate. Each method has inherent strengths and weaknesses; therefore, selection of a method should be guided by which one will provide the most useful data for analysis. Methods can be combined to give the added benefit of triangulation to provide a more complete picture of a topic thus improving understanding, or to validate data and findings. There are disadvantages to triangulation as a researcher is required to acquire the skills involved in conducting each method employed, and data analysis is more complex as it involves comparing, contrasting and bringing findings together. In addition, triangulation can reveal contradictory evidence rather than corroborating findings (Denscombe 2007, pp.134-139).

### *3.5.1 Literature review*

A literature review is often undertaken prior to empirical research as it provides a synthesis of the extant knowledge on a given topic. The scope of a literature review can vary. The emphasis may be on a review of research methods to determine which approach to adopt or examination of current knowledge to inform policy decisions. An essay style review was criticised by Hakim (1992, pp.18-19) for its subjective approach and partial coverage. The preferred style is a meta-analysis which introduces more rigour into the process. Meta-analysis involves statistical analysis to highlight significance in reported study findings. It is a useful tool for reviews of quantitative studies but is not believed to be as appropriate for reviews of qualitative studies (Hakim 1992, pp.19-20). An alternative approach is to carry out a systematic review where explicit procedures are followed making bias less likely to occur (Bryman 2008, p.85). Systematic reviews involve a series of defined steps:

- purpose statement;
- criteria for selection of published works;
- all in-scope works are included in the review;

- study features recorded against a defined protocol (location, sample size, data collection methods and key findings); and
- results summarised and synthesised, possibly presented in a table (Millar 2004, p.145).

One limitation of a systematic review is that differences between studies are not highlighted, resulting in a loss of important detail (Millar 2004, p.146).

A narrative or descriptive literature review is useful for gaining an insight into a topic which is further understood by empirical research. This form of review is more wide ranging, exploratory and not as clearly defined as other types of literature review (Bryman 2008, pp.92-93). Prior studies are compared for trends or patterns in their results (Millar 2004, p.142).

Literature reviews are advantageous because they can be conducted relatively quickly with little cost. They are, however, limited to published literature which may not adequately cover areas under investigation (Hakim 1992, p.24).

### 3.5.2 *Questionnaires*

The criteria for research questionnaires are that they should:

- collect information for analysis;
- comprise a set list of questions which is presented to all respondents; and
- gather information directly from subjects (Denscombe 2007, pp.153-154)

They are ideal tools to use where the researcher wishes to gather information from a large number of individuals who are geographically dispersed, where standard data are required and respondents have the ability to understand the questions being asked. Questionnaires tend to gather information around '*facts*' or '*opinions*' and the researcher must have no ambiguities regarding the focus of their investigation (Denscombe 2007, pp.154-155).



The length and complexity of the questionnaire is a matter of judgement for the researcher. The decision needs to be made by taking into account the audience and time required to complete the questionnaire, however, a major deterrent to completion is its size. Therefore, key research issues should be addressed by the questionnaire (Denscombe 2007, pp.161-162). In addition, when compared with interviews, self-completion questionnaires need to be easy to follow, short to minimise the risk of survey fatigue, and have a limited number of open questions as closed questions are easier to answer in the absence of an interviewer to guide the process (Bryman 2008, p.217).

Prior to releasing a questionnaire to its intended audience it needs to be tested and refined. This pilot process ensures optimal wording and question ordering, tests letters of introduction and analysis of pilot data assists in developing a plan for final data analysis (Oppenheim 1992, pp.47-64).

One of the weaknesses of structured questionnaires is that they provide less depth of information than interviews (Hakim 1992, p.49). To be effective the researcher needs to ensure that questionnaire respondents mirror the wider target population. Failure to do so can introduce bias into the results. Responses also need to be an accurate measure of respondent characteristics (Fowler 2009, pp.12-14).

### *3.5.3 Interviews*

Interviews are a useful source of preliminary information for the researcher and they can help to frame the research to follow (Blakeslee & Fleischer 2007, pp.30-31). In this respect they provide a mechanism for identifying issues and themes. They are also used to obtain in-depth data when “information based on insider experience, privileged insights and experiences” are required (Wisker 2001, p.165). Interviews can take a variety of formats from formal structured, through semi-structured to informal or opportunistic. Formal interviews follow a set structure and question list; for the researcher they are a way of gathering a standard set of data which is consistent across all

interviewees (Blakeslee & Fleischer 2007, p.133). Semi-structured interviews have a defined list of questions but provide scope for discussion (Wisker 2001, pp.168-169).

Interviews are conducted from the perspective of the interviewer; their views will have a bearing on the interview process and subsequent analysis of the transcript. It is therefore important to follow ethical practices, to avoid bias and to be open to the views of the interviewee (Wisker 2001, pp.142-143).

One of the drawbacks of adopting interviews as a research method is that they are time consuming (Gillham 2000, pp.65-66; Wisker 2001, 165). Thus, it is advisable to maintain a focus on the research topic (Blakeslee & Fleischer 2007, 138-139; Gillham 2000, pp.65-66).

#### *3.5.4 Document analysis*

Document analysis draws on written, visual and audio files from a range of sources. Written documents include Government publications, newspapers, meeting notes, letters, diaries or webpages. Particularly attractive sources of data for researchers are those which are freely available and accessible. Documents that are not freely available require the researcher to negotiate access or undertake undercover activities to source. Researchers need to assess the validity of the documents they examine; for a website this involves consideration of the authority of the source, trustworthiness of the website, whether information is up-to-date and the popularity of the website (Denscombe 2007, pp.227-234).

When conducting research based on documents the context within which these artefacts were created and the intended audience should be considered. Bryman (2008, p.527) offered the example of an organisation's meeting minutes which may have been crafted to exclude certain discussions because they could be accessed by members of the public. Background information to meeting minutes might also be available internally, thus connecting them to wider internal events. Researchers may have to probe into the broader picture of events to help them interpret documentary evidence.

### 3.6 *Data analysis*

In quantitative data analysis facts expressed in numerical form are used to test hypotheses (Neuman 2007, p.329). Raw data are processed by software and charts or graphs representing these data produced. Summaries of the data are explained and given meaning by the researcher (Merriam 1998, p.178; Neuman 2007, p.248). Qualitative data consists of words, photographs and other materials which require a different treatment for analysis. Researchers begin data analysis early in their research by looking for patterns and relationships in the data (Neuman 2007, p.329). Data analysis is achieved through a series of steps which involve preparing, coding, identifying themes and presentation (Creswell 2007, p.148). These activities are broken down into six stages: data managing, reading/memoing, describing, classifying, interpreting, and representing/visualising. The following activities are carried out during the process of collating and comparing these data:

- data managing: creating and organising files for the data;
- reading/memoing: reading, note taking in the margins and initial coding;
- describing, classifying and interpreting: describing the data and its context; analysing to identify themes and patterns; making sense of the data and bringing meaning to its interpretation; and
- representing/visualising: findings are presented by narration and visual representations (models, tables, figures or sketches) (Creswell 2007, pp.156-157).

Data analysis is designed to aid the understanding of an event; therefore, core elements of complex events are identified. Data are studied for themes, common issues, words or phrases. These are coded (tagged) into broad categories to develop an understanding of a phenomenon. Codes are not fixed; they change and develop as the research progresses. Thus, initial coding is descriptive and applied to broad chunks of text (open coding). Relationships between codes aids identification of key (axial) components and this leads on to a more focused effort on the core codes (selective coding) which are essential in explaining phenomena (Denscombe 2007, pp.97-98).

This approach is mirrored in the analysis of case study research data. Where data are interpreted and analysed for patterns in order to gain an understanding of the case and surrounding influences and conditions. The researcher questions the data, reading it over and again; taking the time to reflect on the data, their assumptions and analysis. In this way meaning and significance can be better understood and through coding and triangulation the process is enhanced (Stake 1995, pp.78-79).

Stake (1995, p.108) noted that “All researchers recognize the need not only for being accurate in measuring things but logical in interpreting the meaning of those measurements.” The protocol by which this validation is achieved is *triangulation*. There are four methods of triangulation:

1. data source triangulation: identifies whether a phenomenon occurs or carries the same meaning under different circumstances;
2. investigator triangulation: is achieved by having an independent observer of proceedings, or to present research observations and discuss appropriate interpretations with colleagues;
3. theory triangulation: data are compared by researchers with different theoretical perspectives and where agreement is reached triangulation is achieved. When different meanings are derived from the data, there is an opportunity to enhance understanding of the case; and
4. methodological triangulation: findings are confirmed by following a sequence of methods. In case study the most commonly used methods are observation, interview and document review. Adopting a range of methods can confirm events but it may also uncover an alternative perspective or reading of a situation (Stake 1995, pp112-115).

### 3.7 *Research ethics*

Research involving human subjects needs to be conducted in an ethical manner to ensure individuals are not adversely affected by the research (Fowler 2009. p.163). The standards for ethical research practice involve ensuring informed consent, data protection

and privacy (Pauwels 2007). Gaining informed consent from subjects willing to be involved in a research project necessitates that the following points are explained by the researcher and understood by the participant:

- research goals are clearly stated;
- side effects or potentially detrimental factors are transparent;
- gratuities do not act as an inducement to participate in the research; and
- participants can withdraw at any time without prejudice (Pauwels 2007, p.20).

To this list Fowler (2009, p.164) added further guiding principles for research surveys involving general populations including:

- making participants aware of the name of the organisation under which the research is being conducted and providing the interviewer's name;
- notifying subjects of any sponsoring body involved in the research;
- stipulating terms of confidentiality; and
- ensuring there are no negative consequences for non-participation.

Data protection and privacy exist to ensure that data sharing does not infringe an individual's right to privacy. Therefore, researchers are bound to protect identity by coding data during processing and anonymising it to ensure that the connection between an individual and data stored on them are not associated in any traceable way (Pauwels 2007, pp.27-28). Care should be taken when reporting data from small categories of respondents as they might be identifiable. In addition, completed responses should not be available to individuals beyond the project team. It is a researcher's responsibility to ensure that the completed survey instrument is destroyed, or its continued storage is secure, once the research is completed (Fowler 2009, p.166).

Benefits to participating in research are usually altruistic and inducements should not be excessive so that the principle of voluntary participation is upheld. Researchers should not overstate any benefits and any promises made should be met (Fowler 2009, p.167).

### 3.8 *Research approach adopted*

There is no single correct approach to conducting research; however, the approach selected should be that which is most suited to the research problem being addressed (Denscombe 2007, p.3). The selection and application of methodology and methods for this research were guided by prior studies and the range of data required for addressing the research questions.

Due to the gaps in knowledge surrounding UK university library website management and development, identified in the literature review, this research followed a pragmatic view within an experimental and inductive framework. This research was exploratory, answering ‘*what*’ and ‘*why*’ questions, and exploring practice to answer ‘*what if*’ questions (Wisker 2001, pp.118-122). A mixed method approach was, therefore, deemed most appropriate for gathering a variety of data for analysis. A range of research activities were involved at different stages in the process. Views at a macro-level were achieved by quantitative research while views at a micro-level were gathered through qualitative methods (Hakim 1992, p.28). Thus, content analysis was adopted to provide a context for the content and features present on UK university library websites. An online questionnaire was used to provide a broad range of data from a large number of UK university library website managers. Interviews added information to elaborate on the questionnaire in the form of additional examples from practitioners. Case study was adopted to provide in-depth information and real life examples of the practicalities of managing and developing a UK university library website. This holistic approach to data gathering provided strength and depth of information for analysis and interpretation to achieve the research objectives.

The benefits and drawbacks to each method adopted were assessed by reference to the pertinent literature. The practicalities of conducting research on a part-time basis were also taken into account when making the selection of research methods, and in the specific tasks undertaken. The methods adopted are listed below:

- literature review: identified extant literature through keyword searching on appropriate databases. Distilled website usability guidelines, content and features for formation of a checklist applied in this research;
- website content analysis (homepage design, content/features and web analytic code): documented and analysed constituent parts of library websites and recorded the presence of web analytic code over time;
- survey: online questionnaire and telephone interviews; and
- case study: in-depth case study analysis incorporated fieldwork which involved interview and examination of documentary evidence.

The research was conducted over a five year period (2007-2012) with its starting point being a literature review. Empirical data were gathered between 2008-2010 through website content analyses, national survey (online questionnaire and follow-up interviews), and case studies. Website content analysis provided quantitative data on various aspects of website content, features and the presence of web analytic code. A survey was adopted to gather quantitative data to highlight examples of 'typical' and 'minority' cases within the sample population (Hakim, 1992, p.28). It provided an overview of the current situation from the perspective of a large number of practitioners.

In addition, further quantitative collection procedures involved three case studies conducted between August – October 2010. These case studies captured the unique experiences of library staff involved in managing and developing their library's website. Gathering data from multiple sources facilitated triangulation to ensure the credibility of the research (Anfara & Mertz 2006). Each method informed data collection and analyses for the next round of data gathering. Comparison of data sets derived from each method meant that assumptions and results from each stage of the research were tested.

Specific methods, samples and timings of research activities are detailed below:

- literature review: established current themes relating to website design, content/features, management, development and evaluation methods - October 2007 and continued throughout the research;

- document analysis: content analysis of 130 UK university library websites against a checklist of features established core features - October 2008;
- document analysis: longitudinal survey of the code of 130 UK university library websites established the presence, or absence, of web analytic code - November 2007 to November 2010;
- national survey pilot: online questionnaire and interview - eight East Midlands Universities Association (EMUA) library website managers - June to November 2008;
- national survey: online questionnaire and interview - 112 UK university library website managers - February to May 2009; and
- three case studies (first one incorporating pilot survey): joint semi-structured interview with website practitioners having a range of roles in delivery of their library website - August to November 2010.

As a number of methods were adopted, often with overlapping timescales, an overview of the timing of these activities was deemed appropriate (Figure 3-2).

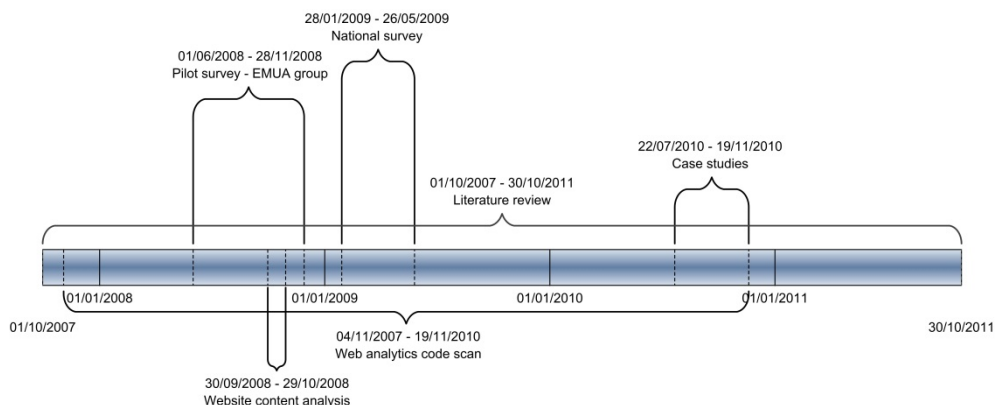


Figure 3-2: Timeline of data gathering activities

Pilot studies were recommended as they contributed to the refinement of the research process and procedures to be followed. They assisted in the development of suitable lines of research enquiry and helped to establish a realistic protocol for use in the field. In case study, the pilot site might represent the most complex example of a case studied, and the general enquiry may be broad in its design. Pilot case study selection is generally driven



by convenience, access and close proximity to the researcher (Yin 2009, pp.92-93). Throughout this research pilots were employed to test the robustness and validity of the instruments. They informed the appropriateness of the data gathered with respect to the research questions. Adjustments in approach indicated by these investigations were enacted prior to final data gathering.

### *3.8.1 Research samples*

A list of UK university library websites was created with guidance from two sources: HERO (n.d.) and Universities UK (2008). The initial list was refined with a number of websites being removed from the study population because they were not classified as universities, or because they were a sub-campus sharing the main campus library website. The final list was rationalised to 130 university libraries (Appendix C) and it formed the basis of the samples used at each stage of the research:

- document analysis: 130 university library websites (October 2008);
- pilot for national survey: Eight East Midlands University Association (EMUA) member libraries (ten member institutions – Bishop Grosseteste University College Lincoln and The Open University were removed from the sample) (June – November 2008); and
- national survey: 112 named contact details were located for the questionnaire, nine follow-up interviews (February – May 2009).

### *3.8.2 Literature review*

Literature relating to library website design, management and development were discovered through structured database searches. Literature from other sectors on these topics was also assessed for pertinent information relevant to library websites. Common and unique approaches to themes under investigation were established and a descriptive review written. The review provided current information on library website issues and informed the research methods adopted for data gathering. In particular, it guided the development of a checklist of website elements and survey questions.

### 3.8.3 Document analysis

Document analysis was adopted because it was an activity which could be undertaken by the researcher independent of any external input from library website practitioners. It provided a valuable opportunity to assess the content and features of UK university library websites. In addition, it provided a context for data gathered at later stages in the research process.

Through analysis of UK university library websites key information relating to two broad dimensions were gathered. Firstly, common website features such as branding, navigation, images, multimedia, search facility, content and services were established. Secondly, the presence of web analytic code was observed over an extended time period. As web analytic software was a relatively new website analysis tool to librarians this activity established uptake across the sector. It also identified the most commonly used web analytic products. Gathering such data involved monitoring and recording various aspects of the websites as detailed below:

- establishing common homepage characteristics (design and content features) of 130 UK university library websites via a snapshot taken in October 2008; and
- monitoring and recording the presence of web analytic code on 130 UK university library homepages at three monthly intervals (November 2007 – November 2010).

The unique decisions designers faced in creating effective homepages were analysed in relation to the design choices and content features of UK university library websites. A map of common page elements was devised through a systematic review of the literature. Factors under investigation in the literature on library, and other categories of, websites were extrapolated and their relevance to this analysis assessed. Broad categories identified in the literature were: design, navigation, search, content, general features, technology and language/terms. Some elements referred to in the literature were subjective; making the researcher put forward a personal view of the website being studied. These elements were more commonly observed in research relating to commercial websites and included: effective use of graphics, visual attractiveness, fun to

use and colourful. Such elements proved difficult to compare and validate, and as such were not included in this research. Other characteristics evaluated were drawn from a list of 40 homepage usability issues and recommendations for business websites devised by usability experts Nielsen & Tahir (2002, pp.52-53). Their recommendations were formulated from a combination of evidence of the way people interacted with websites, and analysis of websites and their common design features. Recommendations were categorised as 'Essential', 'Strong' or 'Default' with these being defined as follows:

- essential: needed to be applied unless there were data to prove that users had another preferred option;
- strong: should be adopted unless website needs dictated otherwise; and
- default: recommendation should be followed unless there was a better option.

Although the focus of their research was business websites, their guidelines have been applied to other categories of website, including libraries. Therefore, twenty of their 40 issues and recommendations were applied in this research. Data collected from UK university library websites were then compared with these recommendations for effective homepage design to establish whether this group of websites met these criteria. Harpel-Burke's (2005) evaluation of medium-sized US university library websites was also taken for comparison.

Elements relating to the library catalogue were often included in library website studies. For the purposes of this research, Prytherch's (2000, p.770) definition of a website was followed: "A set of web pages with an organizational or subject focus." With this in mind, the library catalogue was viewed as a discrete system accessible via the website. It could be argued that visitors to the library website regarded webpages and resources as being interchangeable. However, this research took the view that library website improvement efforts were better directed towards aspects under local control. In this way librarians could be more effective in gathering feedback to inform changes to content and features on their website. Therefore, elements associated with the library catalogue and other databases were excluded from this analysis.

A list of common websites elements was distilled from the literature review and a visual scan of UK university library websites. In this way core design, content and interactivity features were established, and their applicability to UK university library websites assured. These features were then developed into a checklist for use against 130 UK university library homepages. Although the validity of using a checklist to record webpage dimensions was questioned (Zhang & von Dran 2000, p.1253), it had several benefits for this research, namely:

- a standard set of data were returned;
- the instrument was easy to implement across a large sample of websites; and
- it could be used in other studies for validation at a later date.

Thus, adoption of a checklist ensured that recording the design and content features of this group of websites could be repeated, and that the checklist could be scrutinised or tested by other research practitioners.

The checklist was tested on a sample of library websites homepages for ease of use, standardisation, and any ambiguity in the terms or interpretation across a range of library websites. The instrument was also validated by independent testing and a comparison of recording practice was undertaken. This activity showed that there were no significant differences in recording practice. However, a number of minor amendments to the checklist were made to ensure accuracy and uniformity in the data gathering process. The final checklist comprised 86 elements under eight categories (Appendix D). The first category referred to accessing the library website from the university homepage. The remaining seven focused on the library homepage. The categories and number of elements studied are listed below:

- university homepage: accessing the library website from university homepage (five elements);
- library homepage search features (18 elements);
- library homepage navigation features (17 elements);
- library homepage design and typography features (15 elements);

- library homepage content and general features (16 elements);
- library homepage technology and interactivity features (11 elements);
- library homepage strategy and policy features (three elements); and
- library homepage advertising (one element).

This protocol was then applied to the homepages of 130 UK university library websites. A single PC with 17 inch monitor with resolution set to 1280x960 was used by the researcher. Sklar (2012, p.10) reported that in the mid-1990s most monitors in use had a screen resolution of 640x480. By 2010 this position had changed with the most common resolution being 1024x768. However, trends were changing and higher resolution (1280x1024) wide-format monitors were being introduced (Sklar 2012, pp.44-45). The monitor used in this research represented a point between these in resolution. In all cases the browser used to access each website was Internet Explorer with default settings for hyperlinks visited, unvisited and mouse hover over. Internet Explorer was selected for a number of reasons:

- it was the preferred browser at the researcher's institution;
- it provided incomplete support for cascading style sheets and was, therefore, most likely to display a webpage with errors; and
- it was assumed that website managers/developers checked their website for cross-browser compatibility.

The key consideration was to maintain consistency during data gathering and analysis to ensure direct comparison was achieved. Once the matrix for each page was completed, data were entered into an Excel spread sheet to facilitate data analysis. Data were tabulated using simple percentages and charts produced to illustrate common features and anomalous facts.

In-line with Tolppanena, Millerb & Wooden (2000) this research established a core set of content, design features, navigational tools, and technical elements for UK university library websites. Their suggested figure of 50% for determining a core characteristic was adopted in this research.

Alongside the analysis of design features and content, the presence of web analytic code on 130 UK university library websites was established by means of code inspection. Initially, each library website homepage was subject to a visual scan of the source code. This approach had a high degree of accuracy but it proved time consuming. An alternative approach was to source a freely available automated system of code inspection. Web Analytics Research Vendor discovery tool (Web Analytics Research 2008) was such a system. After inserting a webpage Uniform Resource Locator (URL) into its online search box, the tool checked for the presence of web analytic code. This solution was much quicker for the researcher, but it had limitations as not all web analytic codes were identified (e.g., small companies) and URL changes where a redirect page was implemented were not always recognised. Therefore, any anomalies in results recorded over time were visually checked against the code of the website in question. Findings were entered onto an Excel spreadsheet for analysis and the activities were repeated at three monthly intervals to present a graph of adoption over time.

This research established the level of uptake and interest in the emerging field of web analytics. The presence of web analytic code was suggestive of library staff efforts to analyse and understand the use of their website.

The financial implications of implementing and maintaining a web analytic solution might be a deciding factor for an organisation looking to evaluate visitor activity on their website. Direct costs are associated with the purchase of a web analytic solution, and indirect costs associated with implementing metric code and analysing website visitor data. With this in mind, the type of web analytic solution adopted was established to ascertain whether there was a higher frequency in the use of free web analytic tools in UK university libraries. It also revealed whether this group of libraries had adopted a single solution or multiple technologies.

The method adopted allowed prior studies into website design features and content to be taken into account for this research. It also facilitated a comparison of UK university library websites to these prior investigations. Direct analysis of a sample of UK university library websites ensured the appropriateness of the elements recorded.

Analysis of website code for web analytic code provided evidence of the adoption of such code by UK university libraries which was not available in the extant literature.

### *3.8.3.1 Document analysis: alternative approaches*

An alternative approach for gathering data on library website design features, content and web analytic software usage would have been to develop a self-completion survey instrument. However, this process would have introduced a number of constraints in respect of the number of examples to be drawn from, website element coverage, consistency in recording and likelihood of repeat activities being undertaken:

- achieving 100% response rate from the libraries under investigation would have been impossible. Reducing the number of library websites in the sample would have been a valid approach but would not have delivered the comprehensive coverage the researcher desired;
- to encourage responses, a reduced set of elements describing library website design features and content could have been circulated. However, this would not have provided as rich a picture of library websites compared to the extensive checklist developed for the researcher;
- web managers might have been invited to describe the content of their website but this would have resulted in a loss of control over element categorisation and, therefore, reduced the possibility of comparison across the sample; and
- it was believed to be impractical to expect busy library web managers to commit to complying with requests for data about their website at regular intervals, as was the case in the web analytic code study.

In spite of the time consuming nature of these two activities for the researcher, undertaking these evaluations independently ensured consistency in the results obtained and provided a wealth of previously unavailable data on UK university library websites.

#### *3.8.4 National survey*

The literature review illustrated the lack of prior research into website management and development practices at UK university libraries. Therefore, a national survey approach was deemed most applicable for gathering broad data from a large number of respondents. Because data were not available from another source known to the researcher, the survey instrument developed was extensive. It encompassed self-completion online questionnaire and follow-up interviews. The survey gathered data from UK library website managers on their website management and development approaches.

Prior to implementing the national survey, a pilot study was undertaken to test the survey questions and delivery mechanism (online, telephone and face-to-face). The pilot ensured that appropriate lines of enquiry were being pursued and addressed, and that the methods adopted would deliver the required data for analysis. To this end questions were reviewed by a web manager and web analytics expert. The workings of the online questionnaire instrument were tested by a library systems manager. The questionnaire enquired into website management and development practices and it featured a section on web metrics/analytics. Pilot follow-up interviews with respondents to the questionnaire were conducted over the telephone or face-to-face. A semi-structured interview format was adopted to allow for unexpected issues or areas of concern to surface. Lines of enquiry were broad to allow as much scope as possible for respondents to elaborate on their library's situation. The pilot was undertaken between June and November 2008 and was completed by library practitioners from UK EMUA libraries. Appendix E details the findings and lessons learned for the national survey. Appendix F documents the changes implemented in the online survey instrument prior to national release.

The pilot study was followed up with a full-scale national survey comprising online questionnaire and follow-up telephone interviews. The survey was implemented between February and May 2009. From a list of 130 university libraries, contact details for an individual with responsibility for their library's website were gathered, either directly from the library website, or through the library's enquiry system. Some librarians were not able to identify one individual with overall responsibility for their website, this



phenomenon was reported by Taylor (2000, p.116). Invitations to complete the online questionnaire were sent to the 112 confirmed contacts.

The online questionnaire was made available for a two month period (February – March 2009) and it gathered quantitative and qualitative data. Although lengthy, featuring a maximum of 90 questions, the average completion time was just over 30 minutes. Question matching was used so that respondents were presented with appropriate questions for their situation. Not all respondents answered all the questions put to them. The reported percentages were calculated on the number of respondents to each question set, regardless of whether respondents provided an answer to each question. Open and closed questions were included in the questionnaire and every opportunity provided for respondents to elaborate on their answers. Where strength of opinion was required, scalar questions were used. Additional information was wide ranging and included sensitive themes, such as areas of weakness in respondents' library website. Basic statistical analyses were undertaken with Excel and SPSS. Descriptive statistics, presented in tables and charts, were used to highlight patterns and relationships in these data (Brewer 2007, pp.20-21). Free text comments were compared for themes derived by keywords and interpretation of the meaning in the text. Online questionnaire results are provided in Appendix G.

Respondents to the online questionnaire were asked whether they were prepared to take part in any follow-up activities, 20 (15%) indicated their willingness. These individuals were contacted to ascertain whether they were available to take part in a 30 minute follow-up telephone interview. The resulting interviews gathered information relating to website purpose, the relationship between library and corporate website, examples of management activities, development approaches and future directions.

Nine questionnaire respondents agreed to be interviewed; in addition two of the pilot interviews (one face-to-face and one telephone) were included in the analysis. Interviews were conducted between March – May 2009 using a semi-structured interview protocol. This approach provided scope for practitioner themes to be freely expressed and explored. A total of seven questions were asked with the aim of gathering background

information regarding the university and library websites, and the connection between the two websites. Library website management practices, website evaluation techniques and future developments were discussed. To conclude, interviewees were invited to make any other comments on their library website, or suggestions about this research. The interviews lasted between 23 and 46 minutes.

#### *3.8.4.1 Interview questions*

1. What roles does your university website fulfil for the university?
2. What role does the library website fulfil for the library?
3. What is the connection between the university and library website?
4. Can you tell me how your library website is managed?
5. Can you describe how you evaluate the effectiveness of your library website?
6. How do you see the library website developing in the future?
7. Do you have any other comments you would like to make at this time?

An audio recording of each interview was transcribed and presented to the interviewee to be checked. Interviewee corrections were made to the transcript before analysis of key words and themes. Key themes were mapped onto a coding frame for statistical analysis in the form of frequency counting. This analysis led to the development of a series of models to illustrate the setting within which library websites were managed and developed. Website user study methods were mapped against the influence that they had on the development of a library website. A particular area of focus of the models was the use of web analytics and how web managers and librarians adopted and adapted to this new method of website inspection.

#### *3.8.4.2 National survey: alternative approaches*

Alternative methods for data gathering from a broad spectrum of UK university library web managers include a series of short questionnaires focused on a single topic or focus groups (face-to-face or via a Web conferencing tool). Some of the issues and potential benefits involved with these activities include:

### *Series of short questionnaires*

- Inconsistency in respondents presenting a different set of answers to each questionnaire would make it difficult to get a reliable picture of experiences across the sector.
- Responses to questionnaires were likely to diminish over time as survey fatigue set in.
- Individuals with a particular interest in a topic were likely to only respond to one questionnaire; this may lead to a biased view overall.
- The reverse of the points raised above might have been the case. Shorter questionnaires may have encouraged a greater response rate and individuals with an interest in a specific topic might have revealed greater insights into that topic.

### *Focus groups*

- Scheduling interviews with individuals can be problematic and so gathering focus groups would present additional barriers to contribution.
- Group discussions would present an opportunity for library website practitioners to share experiences and to ask questions that the researcher may not have considered, or be in a position to ask.

Focus groups are useful for gaining insights into activities and providing a forum for practitioners to share experiences. They present difficulties in recruiting participants, scheduling and financial cost (reimbursing participants for travel, subsistence and their time). Assistance from a note taker is required and they are difficult to facilitate ensuring all participants have an opportunity to contribute to the discussion (Walliman 2006, p.87; Denscombe 2007, pp.178-181).

#### *3.8.5 Case study*

Case study was adopted as an appropriate method for gathering information to supplement and enhance data from the national survey. Case study research was ideal for

gathering in-depth data on a small number of events in context. Therefore, employing that method facilitated exploration of the reasons why certain website practices were adopted by UK university library website managers for managing and developing their library's website. The units of analysis were UK university libraries and the actors studied were library website managers, web editors, a technical consultant, content editors, a marketing specialist and academic librarians.

Selection of the cases was based on prior involvement in earlier stages of this research (questionnaire and interview) and because cases exhibited different factors in relation to website evaluation practices. This approach ensured a representative sample of cases was investigated and that a clear link existed between national survey and case studies:

- Library A was selected as a pilot case study because staff members were involved in website user studies and web metrics. Library staff expressed a willingness to continue their participation in this research and their close proximity to the researcher made them a convenient case;
- Library B was selected because user studies and web metrics informed staff evaluation of their website; and
- Library C was selected as a case study because, at the time of the national survey, staff members were not conducting user studies or web metric evaluations. However, during the course of the group interview it became apparent that this position had changed as user studies had recently been conducted and the university was in the process of implementing Google Analytics.

A broad range of options for gathering information from case sites were adopted:

- primary evidence: interviews with the web manager, technical consultant, content editor, marketing specialist, academic librarian, website project member were conducted; and
- document analysis: policy/strategy, web group minutes, website evaluation data (recent surveys, analytic data, and so forth) were consulted where available. In addition, independent of case study participants, their university websites were

consulted for documentation relating to website policy or use of Google Analytics, as applicable. university advice for website managers and content contributors illustrated specific areas of importance to the university.

In advance of the case interviews, details of website management and development practices derived from the national survey were studied. This gave the researcher an opportunity to gain familiarity with the case conditions and provided pointers to themes and questions for discussion.

The pilot case was an opportunity to test themes to be investigated and the research approach. From initial contact with one study participant it was clear that their university's 'informal approach' was also adopted by the library. In this context a tightly defined research plan including a series of formal questions was not deemed appropriate. Adopting a more informal approach, as suggested by the phrase: "The responsive interview as an extended conversation" (Rubin & Rubin 2005, p.108), was considered more appropriate in this case. Therefore, a more discursive atmosphere might be created at the interview by exploring general themes interspersed with a number of questions on specific lines of enquiry. General themes and key areas of investigation were devised prior to interview. These provided a reference point throughout the interview, acting as a checklist to ensure that all topics were covered. In this way discussions flowed naturally and the interviewer was able to ensure that themes were addressed. Discussions provided a forum for library staff to relay their own experience of working on their website. It was intended that their priorities and concerns should surface at this stage in the research process. Some of the research themes were not discussed at interview because it became apparent that they were not appropriate to this case.

Another key factor in determining both the format and tone of discussions was influenced by the interview setup. For the pilot case "multiple person interviews" were conducted (Rubin & Rubin 2005, p.122), a practice which introduced the dynamic of the relationship between participants. Interactions between participants and interviewer were an important determinant in the course of discussions, and in questions posed at interview. This dynamic was observed at one point when a participant asked questions of

their colleagues and the interviewer. Taking part in open discussions of this nature provided opportunities for all involved to present their perspectives on the topic in question. An outcome for interviewees was that they made discoveries about their colleagues' website analysis practices and areas for potential exploration were revealed. The interviewer was also able to witness the dynamic of the working relationships between interviewees, and benefited from questions being asked that she may not have been able to pose.

Informal group interviews were conducted at each case study site between August and November 2010. Individuals involved in managing, maintaining or developing their library's website were in attendance:

- Library A: group interview conducted on Wednesday 4th August 2010. Interviewees included an individual with an overview/strategic input to the website, technical development, and a webpage owner/content contributor who was also heavily involved in a recent website rejuvenation project;
- Library B: group interview conducted on Thursday 21st October 2010. Interviewees included an individual with a strategic management role in the website, the website content manager and the library's marketing manager; and
- Library C: group interview conducted on Thursday 18th November 2010. Interviewees included the Website Manager and two Trainee Web Editors.

A list of research question guided discussions around broad themes (website background; management and maintenance; user studies and web metrics; and corporate influence) (Table 3-1).

<b>Theme</b>	<b>Question(s)</b>	<b>Information provided</b>
Background	Approximately how many pages are there in the website?	Size of the library website.
Management and maintenance	How many full time equivalents working on website?  Which development model is adopted?  Are the benefits of evaluation weighed against staff time?  What drives decision-making in the absence of website strategy?  How are decisions made with regards to technical and strategic areas of website delivery?	Staffing levels.  Continuous improvement or major change?  Justification for evaluation.  Alternate approaches to website direction.  Group dynamics.
User studies and web metrics	Which metrics are gathered and which ones are used?  What is the balance of feedback and how does it inform website development?  How do you measure resource use in a Web 2.0 environment?	Specific metrics in action.  Do methods used provide complementary or conflicting evidence? Are the strengths and weaknesses in each method understood?  Measuring different services.
Corporate influence	How does university policy influence the library website?	What areas are covered: design, development, content, management or technical systems (Content Management System - CMS)?

*Table 3-1: Case study themes*

A digital recording of the interview was made for analysis; full transcription was not undertaken due to time constraints. Instead, discussions were summarised and potential quotations of key points were written out in full and identified in the text. The broad research themes provided a starting point for analysis of the text. Key themes arising from interviewees' perspectives were also identified and passages covering these themes were grouped together for reporting purposes. An initial draft report did not present the researcher's summary and the interviewees' comments clearly enough. This highlighted the fact that:

*Though the analysis is based on the descriptions presented by the interviewees, the interpretations in the final report are those of the researcher (Rubin & Rubin 2005, p.201).*

However, a clear delineation between the researcher's interpretations of the facts presented at interview and direct quotations is imperative. In short:

*Whatever the level of precision of the transcript, you need to be clear on the distinction between what the interviewees said and what you interpreted or summarized (Rubin & Rubin 2005, p.204).*

With this in mind, the case report was adjusted to ensure that a clear distinction between interviewees' comments and researcher interpretation was presented. Comparison across case studies was not made as each case was viewed as a separate unit, and the case report viewed as a descriptive write-up of events within those units. Each case reflects the unique factors within the library and the staff involved in managing their library's website.

The case studies provided examples of website management in the context of real-world issues and solutions. Findings were presented as a case report with sections describing activities associated with each broad theme.

#### *3.8.5.1 Case studies: alternative approaches*

Alternative approaches to case studies, whilst still maintaining depth of information from a small number of libraries, include inviting staff involved in website work to keep a diary of events, or site visits involving observation of website duties, meetings and evaluation activities. Some of the issues and potential benefits involved with these activities include:



### *Practitioner diaries of events and activities*

- Maintaining a diary would present too great a time commitment for participants. In addition, unless guidelines on content, structure and length of diary entries were provided, comparing experience through individual diaries would be difficult.
- Keeping a diary might have been insightful for library website staff.
- Analysing individual diaries would potentially reveal detailed information on management and development activities. It may also have shown participation from library staff or departments on campus that were not highlighted elsewhere.

### *Site visits*

- It would be difficult to recruit libraries willing to allow the level of observation required.
- Visits would be potentially disruptive to host library staff.
- These activities were considered to be time consuming for researcher in both data gathering and analyses.
- Resulting write-ups would have limited value to a wider audience.
- The presence of an outside observer could make library staff consider the activities and workflows involved with their website activities.

### *Action research*

Action research is used by social scientists involved in small-scale practical research projects. It is often undertaken by professionals to improve understanding of work activities with a view to improving their own working practices, for example, organisational development. It involves a cyclical research process with those affected by the intended change being involved in the research process. As action research tends to focus on aspects of practice, change tends to occur at the micro level, rather than across an organisation. Practitioners are involved in reflection and systematic research activities provide data for analysis. Because action research is so closely tied to practitioners and their organisational setting, generalisation and development of theory are not applicable.

However, existing theories can be utilised in the research process and existing knowledge can be evaluated (Denscombe 2007, pp.122-130). Bryman (2008, p.380) stated that as action research was rooted in achieving practical outcomes and was, therefore, more widely adopted by organisations and in the education sector.

The possibility of conducting action research was explored in the early stages of this research. One of the obvious benefits of conducting such a study was that theories could have been tested in practice. Direct feedback on the appropriateness of suggested methodologies could also have been gathered from library staff. At a practical level this could have included: evaluation and testing a strategic management and development methodology; close examination of the workings of a library web group and website duties performed by staff; evaluation of website feedback methods and tools; analysis of website design and any changes made to a library website in response to web analytic and other feedback; and, development of a blueprint for effective library website management and development.

Despite the many merits of action research, the appropriateness of conducting a study within the researcher's workplace was re-evaluated when website responsibilities were reallocated. At that time, it was felt that gaining the level of access required for undertaking a study involving high levels of intervention in the management and development processes within a host library would have been very difficult to negotiate. In addition, the time commitment involved from the researcher would have been impossible whilst working in a full-time post elsewhere. However, there is clearly scope and considerable value to be gained by undertaking such a study.

### *3.9 Conclusions*

To meet the research objectives a range of methods were required. This chapter set out the methods used and how they aligned with the research objectives. As this research revealed unique insights into UK university library website management and development activities it was essential to employ a range of data gathering and analysis techniques. The methods adopted were established in prior studies of other groups of

libraries and individual cases reported in the literature. In summary, the literature review informed methods, dimensions investigated and questions included in the national survey. The methods adopted in this research were in-line with prior studies and provided a range of breadth and depth data.

The following chapter represents the first phase of this research and it establishes the content and features present on UK university library websites and the uptake of web analytic software. These data provide context for later rounds of information gathering.

## Chapter 4      Content analysis of UK university library websites

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### *4.0 Introduction*

This chapter identifies the content and features of UK university library websites established through analysis of these websites against a checklist. It also establishes interest in web analytics, a relatively new method for analysing website usage patterns. The two activities both provide context for other research activities and the resulting data.

The value placed on the homepage of a website was evident in the number and variety of studies in which it was the focus of research. This was seen to be the case in the domains of education and business. For example, Vaughan (2001, p.86) noted that successive library website redesign efforts paid particular attention to the homepage. In this research, the web presence of UK university libraries was evaluated. Common website elements across these websites were identified through systematic review of the literature and preliminary analysis of the websites in question. A checklist of elements was created with which to record library websites against. In a parallel study, an aspect of website monitoring was investigated by inspecting for web analytic code.

Adopting a multi-faceted approach facilitated the disclosure of UK university library website design conventions, core content and adoption of web analytic software.

#### *4.0.1 Research objectives*

The objectives of these studies were to provide a comparison of website content and features across UK university library websites, and to discover the uptake of web analytic software over time.

Objective 1b. To analyse the content of UK university library websites to establish core characteristics and compliance with design guidelines for usability.

The checklist devised by analysis of prior research was applied to UK university library websites. Compliance with design recommendations for usability was established and the presence or absence of web analytic code tested to achieve this research objective.

Objective 2. To record and analyse UK university library website management and development practices, including strategic dimensions.

The presence of web analytic code informed objective two in that the presence of this code was suggestive of website analysis activities. The presence of a library mission was considered to be an indicator to library strategy.

#### *4.0.2 Accessing the library website from the university homepage*

Under half (51 - 39%) of these library websites were directly accessible from their university's homepage. This finding contrasted with that of Welch (2005b, p.227) who found that out of 106 US colleges and universities in her study 80% featured a direct link on the corporate homepage to their library's website. Conducting a search using the university's search tool proved to be the most successful method of locating the library's website with 122 libraries (94%) being accessed by this method (Figure 4-1).

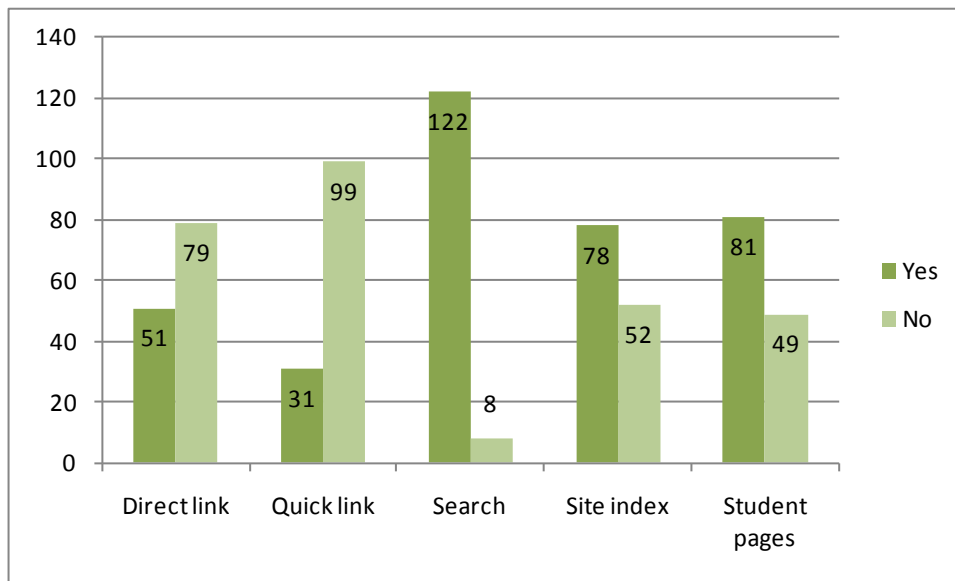


Figure 4-1: Accessing the library website

#### 4.0.3 Library homepage search features

The majority (117 - 90%) provided one form of search option or another. This included the option to search the library website (44 - 34%) or a link to search the library website (37 - 28%). The availability of links to search either the library catalogue (126 - 97%) or electronic resources (107 - 82%) were much more common than for website search (Figure 4-2). In comparison, Harpel-Burke (2005, p.201) found that 65% of the libraries in her study had searchable websites. In addition, Detlor & Lewis (2006, p.253) studied 107 ARL homepages and found that 70% had search options, although over 10% were inadequately labelled.

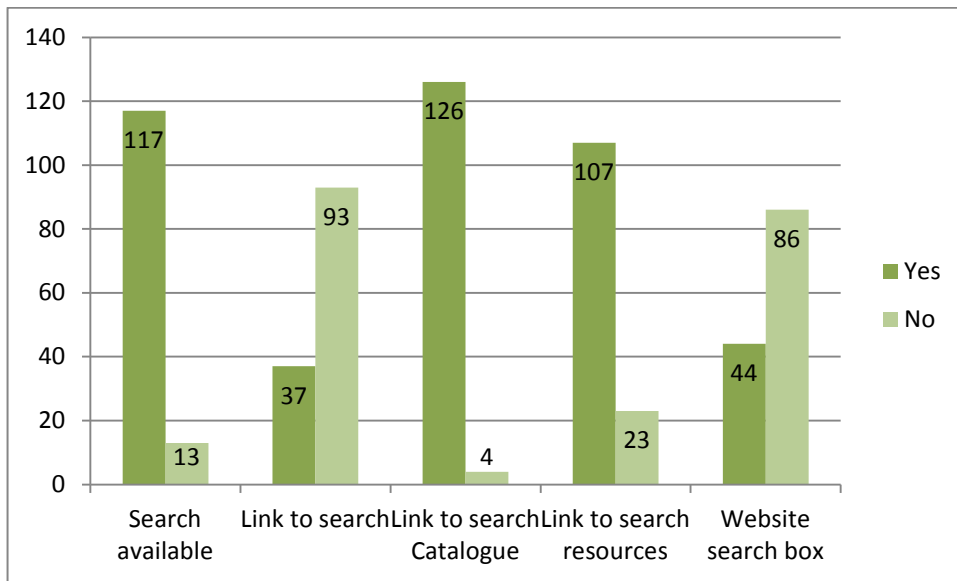


Figure 4-2: Search options

One limitation of the search function was that it did not always allow for a dedicated search of the library website. In these cases search coverage included the whole university website taking in faculties and departments.

Just over half (74 - 57%) of the libraries in this study had a search box on their homepage. This figure was slightly higher than the 47% reported by Harpel-Burke (2005, p.201). A quarter (33 - 25%) had no search box while others provided multiple search boxes (23 - 18%).

Nielsen & Tahir (2002) regarded a search feature as an essential criterion for a homepage which they stressed should be a box. Although the availability of a search option was adhered to by the majority of libraries this was not always a search box. In some instances, when a search box was provided it did not allow for an exclusive search across the library website. Only 44 (34%) library homepages complied with this criterion.

#### *4.0.4 Library search box features*

The following figures relate specifically to the 44 instances where the library website featured a dedicated search box capable of searching across the library website to the exclusion of the university website as a whole. Comparison to Nielsen & Tahir's (2002) guidelines should be viewed with caution because of the reduced number of libraries featuring a search box on their homepage.

Just over half (26 - 59%) of the search boxes featured a descriptor. Nearly all (43 - 98%) provided a search button. The inclusion of a search button was strongly recommended by Nielsen & Tahir (2002) who added that it should be labelled 'Search' or 'Go'. The label 'Search' was applied by 18 websites (41%) while 'Go' was used by 19 (43%).

The majority (37 - 84%) of library website search boxes allowed a visitor to input a search string of fewer than 25 characters into the search box while still remaining visible on screen. Nielsen & Tahir (2002) strongly recommend that at least 25 characters be allowed but added that 30 was preferable. Only seven (16%) homepages featured a search box of 25 characters or more. A much greater proportion (53%) of libraries in Harpel-Burke's (2005, p.201) study adhered to this guideline.

The most popular option for the placement of the search box was the upper right section of a webpage (28 - 64%). This complied with Nielsen & Tahir's (2002) essential recommendation that a search box should be located in the right or left corner. Detlor & Lewis (2006, p.253) commented that the placement of a search box did not always aid discovery as it was often located at the bottom of the screen. However, they did not quantify this finding, therefore, direct comparison with this study was not possible although it suggested that UK libraries had better placed search boxes as they were rarely placed in the lower portion of the homepage (4 - 9%). The upper centre of the homepage (34%) was the preferred option for libraries in Harpel-Burke's (2005, p.201) study.



Having a simple search option proved the most popular (33 - 75%) and was a strong recommendation from Nielsen & Tahir (2002). Eleven libraries (25%) offered a more advanced search feature on their homepage. In Harpel-Burke's (2005, p201) study nearly all of the libraries provided a simple search option (97%).

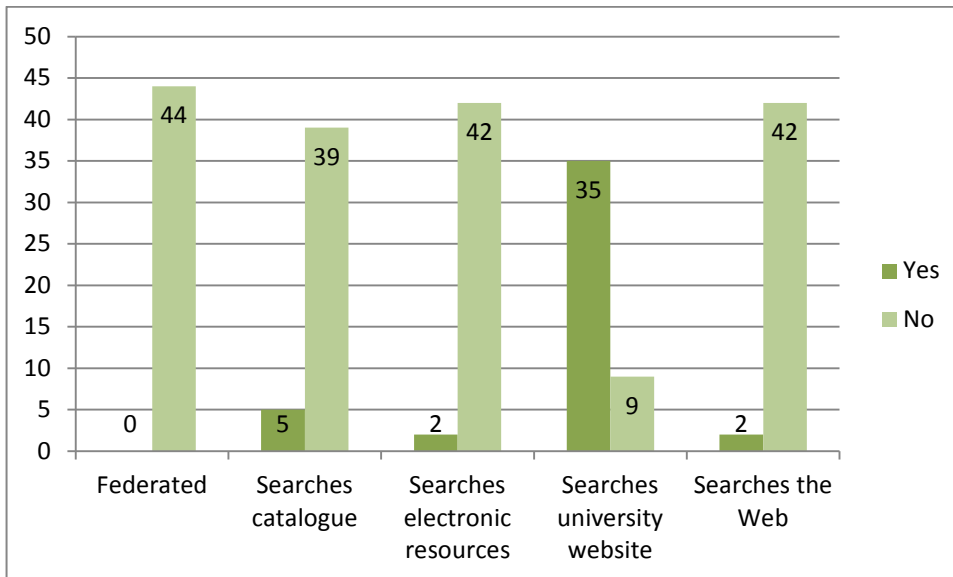


Figure 4-3: Search options available

Additional search options were quite limited with the most popular being to allow visitors to search across the university website (35 - 80%). In a very small number of cases (five - 11%) the library catalogue could be searched from within the library website search box (Figure 4-3).

#### 4.0.5 Navigation features

Relatively few libraries provided links to either a website index 39 (30%) or a website map 28 (22%) from their homepage. A link to a website map was classified as a strong recommendation by Nielsen & Tahir (2002). Harpel-Burke (2005, p.203) provided a single count of 50% for the presence of a sitemap (sitemap, link or other term), this was comparable with this study. Detlor & Lewis (2006, pp.252-253) recorded 54% having a site index and only 24% a site map.

There were three main locations for navigation bar/links on the homepage, these were to the left side (75 - 58%), top (30 - 23%) or on the central area of the page (19 - 15%). Nielsen & Tahir (2002) strongly recommend that one of four options (left side, tabs, links at top of page, or categories on the centre of the page) be adopted. Libraries complied with this with the exception of those opting to put navigation links on the right side of the page (three - 2%), or other option (two - 2%).

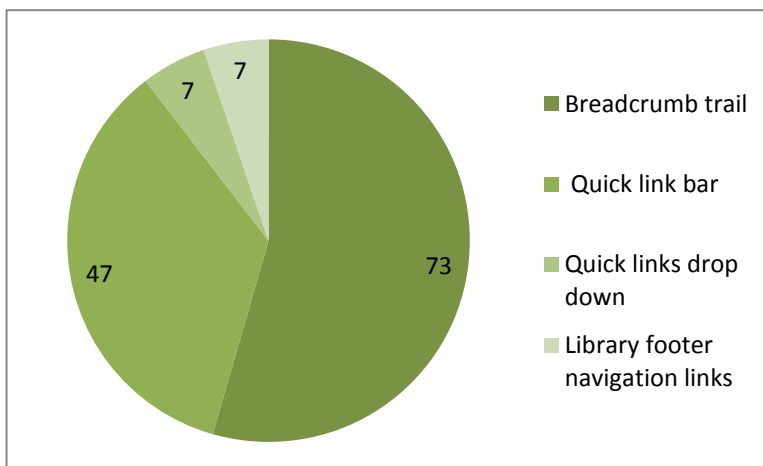


Figure 4-4: Navigation options

The provision of a quick links bar for regularly accessed resources was provided by 47 (36%) libraries. In addition, seven (5%) examples of this feature were presented as a drop down menu. A link to the Intranet or VLE was provided on 41 (32%) homepages. A breadcrumb menu to aid navigation through the library website was available on 73 (56%) websites (Figure 4-4).

Ten libraries did not have any hypertext links on the central area of their homepage. In these cases, access to other library pages was via menu links, navigational links or buttons. The following data refers to the 120 libraries that had hyperlinks on the central area of the homepage. The convention of advertising a hyperlink on the page by having it underlined was followed by 104 (87%) libraries. Link underlining was a strong recommendation of Nielsen & Tahir (2002) with the exception of navigation bar links.

A range of options were observed for the hypertext link colour on the page, the most popular being blue (90 – 75%). This feature was also strongly recommended by Nielsen & Tahir (2002). In addition, two libraries provided hypertext links in two colours, another offered links in six different colours, and one library provided a background colour to the links. Visited hypertext links displayed in a number of colours but the predominant choice was blue (60 – 50%). Nielsen & Tahir (2002) recommend purple as a safe default, but only nine (8%) complied with this recommendation. Representing a visited link in a different colour to an unvisited link was regarded as essential by Nielsen & Tahir (2002). In this research 49 (41%) libraries complied which compared favourably with 26% in Harpel-Burke's (2005, p203) study. There was no clear preferred option for mouse hover colour. Red was a popular colour, with 27 (23%) choosing this option, black was used by 15 (13%); finally purple, grey, blue and orange were each used at 10 (8%) libraries. Link popup text on mouse hover only appeared on seven (6%) library homepages.

Most homepages (95 - 73%) were displayed within the confines of a maximized browser window on the test PC setup of a 17 inch monitor with a screen resolution of 1280x1024 pixels. Display within one or two screens was the strong recommendation of Nielsen & Tahir (2002), but certainly no more than three (1000 to 1600 pixels as a maximum for displaying content). Only one library homepage extended to four screen lengths.

#### *4.0.6 Design and typography*

Three quarters of library websites (98 - 75%) had a homepage which was very similar to other pages in their website. In some cases this may be explained by the use of a content management system or standardized single website template.

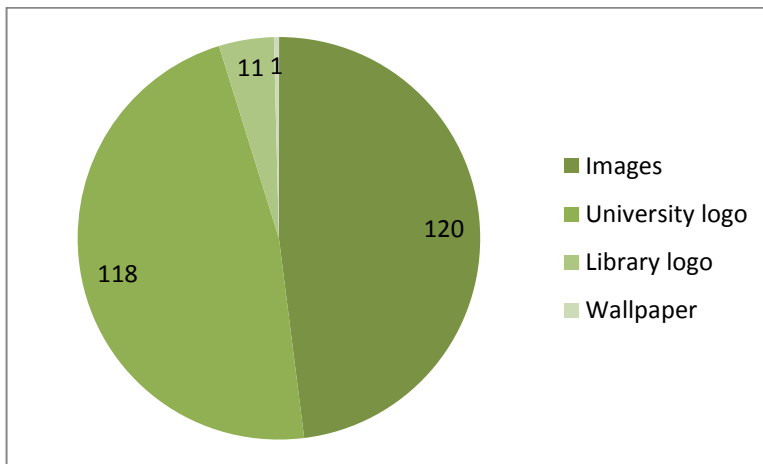


Figure 4-5: Visual appearance

University branding in the form of a logo (118 - 91%) was common amongst the websites evaluated. The presence of a library logo was rare, with only 11 (8%) examples found. Nielsen & Tahir (2002) regard logo placement to the upper left side of the page as being essential (Figure 4-5).

Most (120 - 92%) libraries made use of images on their website, but avoided using a background image to their homepage (129 - 99%).

Sixty-three (48%) gave visitors the ability to resize their browser window whilst still displaying the entire contents of the page (liquid layout). This option was strongly recommended by Nielsen & Tahir (2002).

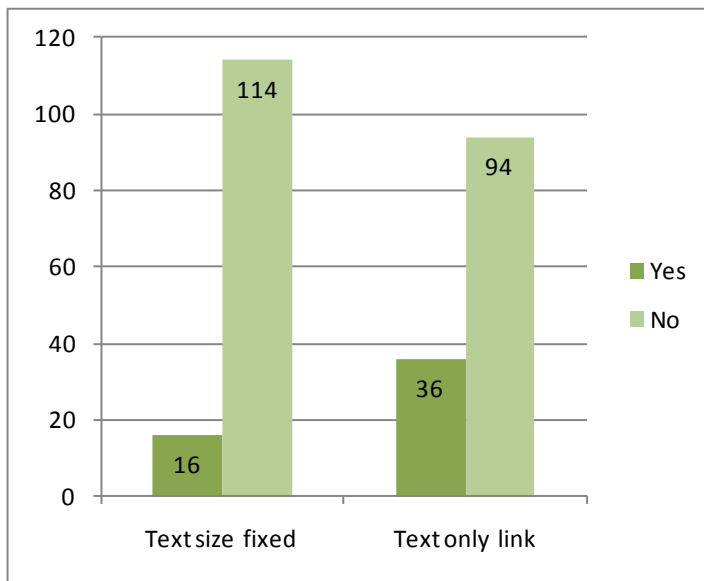


Figure 4-6: Accessibility features

In most cases (114 - 88%) homepage visitors were able to alter the text display size through their browser settings (Figure 4-6). This figure was similar to the 74% reported by Harpel-Burke (2005, p.204) and it was a feature Nielsen & Tahir (2002) regarded as essential.

One accessibility option observed was the provision of a text only version of a website. This was available on 36 (28%) of the websites studied.

A white background to the homepage was preferred for most libraries in this study (117 - 90%). Nielsen & Tahir (2002) made this a strong recommendation, and it was a feature of 83% of libraries in Harpel-Burke's (2005, p.204) study.

A black (88 - 68%), or dark (17 - 13%), text colour was selected to contrast with the predominantly white background to the page. Black was the strong recommendation of Nielsen & Tahir (2002). One website included body text of two different colours.

Just over half the websites used between six to 10 colours (57%) on their homepage, while around a third opted for between zero to five colours. For this count, the colours appearing on images on the homepage were not included.

The number of words counted on these libraries' homepages ranged from 30 to 871, with the average number of words per homepage being 285.

#### 4.0.7 Content and general features

The most popular content features were found to be a contact us link (105 - 81%) and news/announcements (97 - 75%). The provision of a contact us link was regarded as essential by Nielsen & Tahir (2002) and its importance was recognised by the 85% of libraries in Harpel-Burke's (2005, p.205) study matching this criterion. An about link was only available on 64 (49%) websites; Nielsen & Tahir (2002) made the inclusion of an about link a strong recommendation. The provision of a help link was made at 50 (38%) library homepages. Welch (2005b, p.227) recorded a much higher figure of 85%. According to Nielsen & Tahir (2002) a link to help should only be provided in cases where the complexity of the website required it (Figure 4-7). However, for the purposes of this study 'help' was regarded as having a broader remit. It was taken to mean help in using the library or its services.

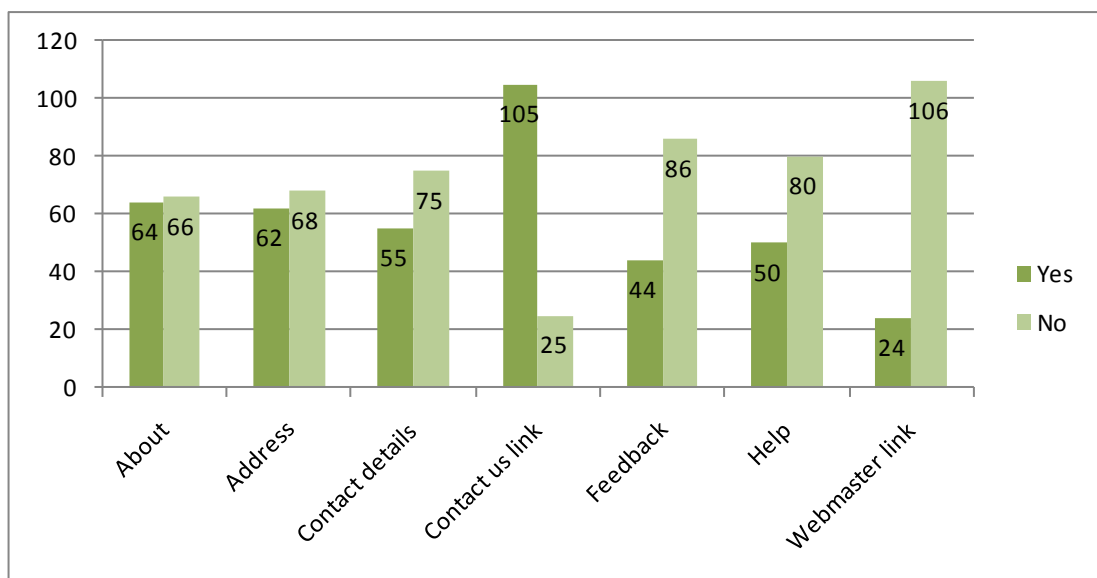


Figure 4-7: Library details 1

Of the 97 homepages having a news/announcements section, 13 (13%) provided a link to a separate webpage for this feature. This was markedly lower than the 68% only providing a link to news in Welch's (2005b, p.227) study. This suggested a trend away from linking to news items in favour of featuring them on the homepage. This proved to be the case for UK library homepages where the remaining 84 (87%) listed the title of each news item (39 - 46%), 31 (37%) gave the title and lead into the full story, and 25 (30%) offered the title and full story on the homepage. Only 21 (25%) added a date to the news item as an indicator of currency. The number of news items available varied, the lowest number being one and the highest 11. Altogether these 84 websites provided visitors with a total of 326 news items, the average number was 3.88. Other features included were a spotlight or special feature, research support, frequently asked questions (FAQ) and date the homepage was refreshed (Figure 4-8).

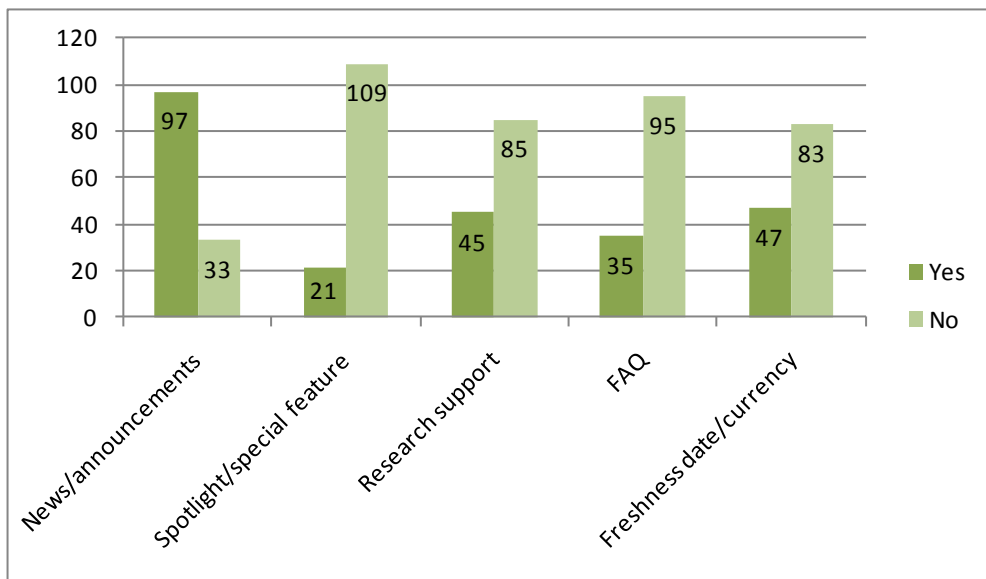


Figure 4-8: Library details 2

The terms used to describe library services were investigated with the library catalogue and databases providing the focus. The vast majority (122 - 94%) selected the term catalogue to describe their online public access catalogue, other terms were rarely chosen.

A wider range of naming conventions was used for describing database resources. The most commonly used term was database (39 - 30%) (Figure 4-9).

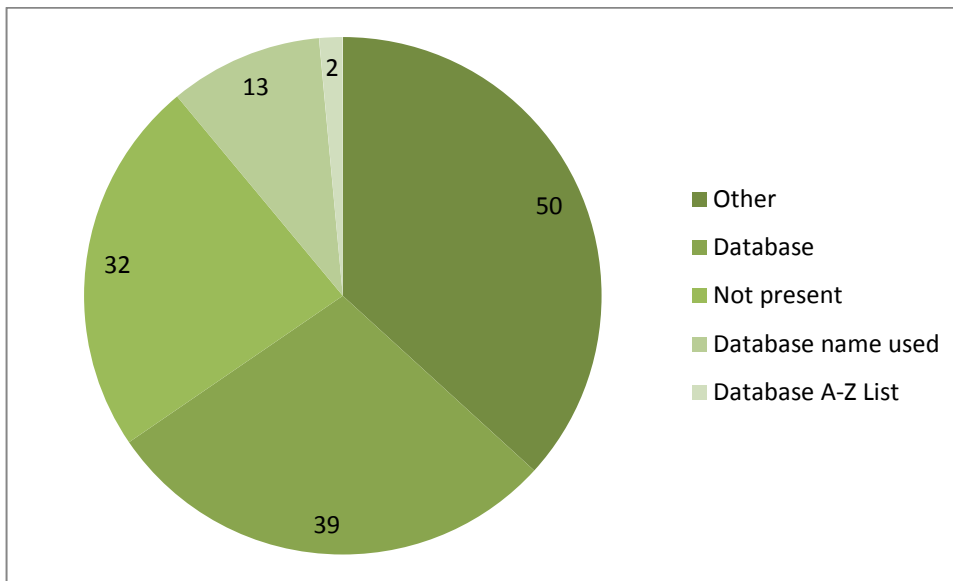


Figure 4-9: Library terminology

#### 4.0.8 Technology features

Of the technologies evident, a link to sign in/customisation (35 - 27%), a news feed (RSS) (25 - 19%) or a blog (21 - 16%) were most likely to be provided (Figure 4-10).

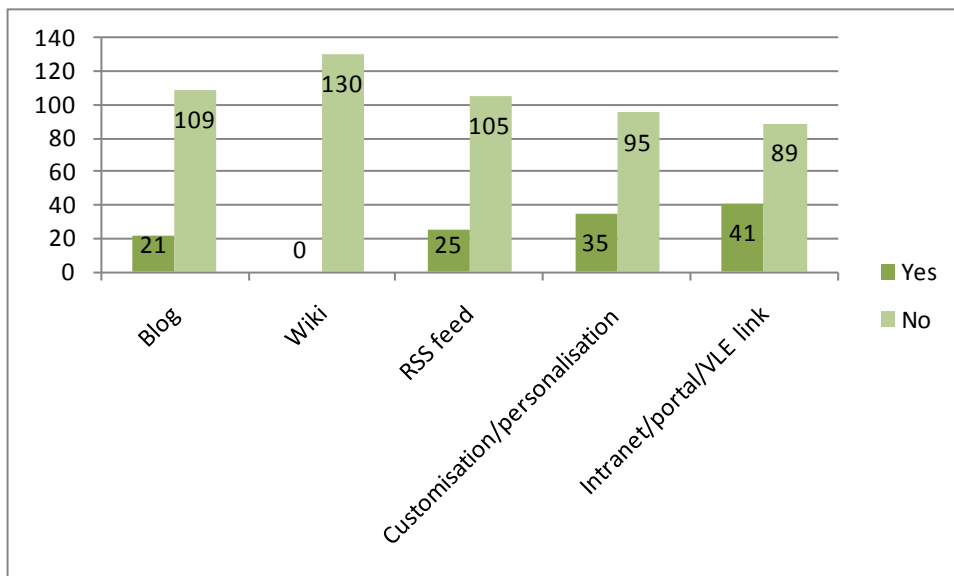


Figure 4-10: Library technology features 1



Other technology features included animation (12 - 9%), video (11 - 8%) and podcasts (nine - 7%) (Figure 4-11). Animation was a feature that Nielsen & Tahir (2002, p.22) advised should not be included on a homepage because it distracted viewers' attention away from other elements on the page. This note of caution was heeded by the libraries in Harpel-Burke's (2005, p.204) study as only 11% included animation on their homepage. The term animation has been interpreted here as changing image display as well as flashing graphics. Both of these have been included in the animation count for library homepages.

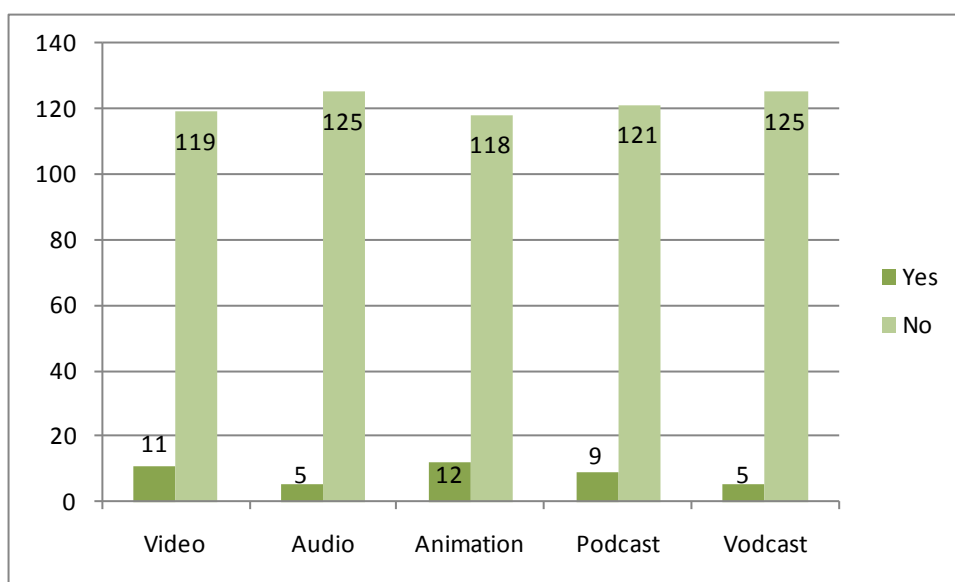


Figure 4-11: Library technology features 2

The notes column on the checklist was used to record novel features of interest not recorded elsewhere. A total of 45 (35%) libraries included an item of note. One such feature was an online chat widget used for the enquiry service. At the time of this research this service was only seen on six library homepages, however, use may increase as librarians look for different ways to deliver services and engage with their users. Relatively few libraries were recorded as taking advantage of social networking sites such as Facebook (five libraries), or resource sharing sites like YouTube (two libraries). The provision of accessibility options for altering text size, background colour or contrast were available on 10 homepages while social bookmarking was present on seven.

#### 4.0.9 Mission and policy features

Although legal and policy information was provided on 75 (58%) homepages, fewer provided a link to accessibility statements or advice (59 - 45%). These policies and guidance documents were often provided by the university (Figure 4-12).

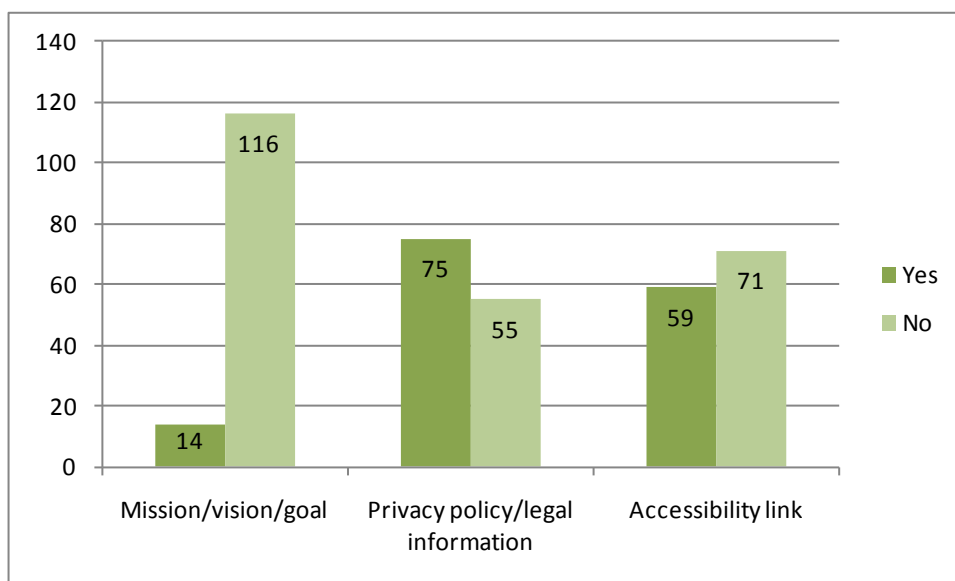


Figure 4-12: Library mission and policies

Few libraries included mission statements on their homepage or featured a link to it from there (14 - 11%).

#### 4.0.10 Advertising

Many library homepages featured advertising (98 - 75%) in the form of a database name, VLE system, search tool provider, reference managing system name, Investors in People icon, campus book supplier and others. A maximum of three advertisements was the strong recommendation from Nielsen & Tahir (2002). Library websites did not have banner advertising or areas on the homepage dedicated to advertising. They did have references to suppliers (supplier logos), a Google branded search box or similar feature.

#### *4.1 Library website content analysis: Summary*

The following section presents the elements that commonly appeared on UK university library websites and showed whether they conformed to the design conventions set out by Nielsen & Tahir (2002) (Table 4-1). Their recommendations were quantified to indicate strength of the requirement for user experience. Thus, 'Essential' recommendations needed to be applied unless there was data to prove that users had another preferred option. A 'Strong' recommendation should be adopted unless website needs dictated otherwise. A 'Default' recommendation should be followed unless there was a better option (Nielsen & Tahir 2002, pp.52-53). Librarians implemented 14 of the 20 recommendations investigated which represented a considerable proportion. Features with an 'Essential' recommendation that were not implemented were, changing link text colour to identify links visited and including a link labelled 'About the Library'.

<b>Characteristics from Nielsen and Tahir</b>	<b>Nielsen &amp; Tahir rating</b>	<b>Nielsen &amp; Tahir recommendation</b>	<b>Library website compliance</b>
<b>Search</b>			
Search	Essential	Search box	Implemented – 74 (57%)
Search placement*	Essential	Upper part of page, preferably to right	Implemented – 28 (64%)
Search button*	Strong	Label button “Search” or “Go”	Implemented – 37 (84%)
Search box width*	Strong	At least 25 characters (30 preferred)	Not implemented – seven (16%)
Type of search*	Strong	Simple search (advanced search should not appear on homepage)	Implemented – 33 (75%)
<b>Navigation</b>			
Navigation	Strong	Either left menu, tabs, links across top or categories on page	Implemented – 125 (96%)
Sitemap link	Strong	Call it ‘Site Map’ and include if you have one	Not implemented – 28 (22%)
Page length	Strong	One or two screens, no more than three	Implemented – 112 (93%)
Link colour, unvisited**	Strong	Blue	Implemented – 90 (75%)
Link colour, visited**	Default	Purple	Not implemented – nine (7%)
Link colour different for visited and unvisited links**	Essential	Yes - unvisited links should be a saturated colour, unvisited links desaturated (not grey)	Not implemented – 49 (41%)
Link underlining	Strong	Yes - exception links in navigation bars	Implemented – 104 (87%)
<b>Design/typography</b>			
Liquid layout	Strong	Use liquid layout	Not implemented – 63 (48%)
Body text colour	Strong	Black	Implemented – 88 (68%)
Body text size frozen	Essential	No - users should be able to adjust size.	Implemented – 114 (88%)
Background colour	Strong	White	Implemented – 117 (90%)
<b>General features</b>			
About	Essential	Always include	Not implemented – 64 (49%)
Contact information	Essential	Call it ‘Contact Us’	Implemented – 105 (81%)
Help	Default	Only provide if website is complex	Implemented – 50 (38%)
<b>Technology/interactivity</b>			
Animation	Strong	Do not include	Implemented – 12 (9%)

Table 4-1: Comparison to Nielsen & Tahir

\* Out of 44 library website search only (excludes other university departments).

\*\* Out of 120 with hypertext links on the page (excluding navigation menus and buttons).

The checklist evaluation of UK university library websites established core content as follows:

- search feature: either a link to 'Search' or search box on the homepage for searching the catalogue, subscription resources or website;
- navigation: user navigation was aided by a navigation bar on the left, a breadcrumb trail, hyperlinks on the homepage were blue underlined and contents were displayed within a single screen;
- design and typography: homepage design was similar to sub-pages, university branding was evident, images were used, text size could be altered in the browser settings, a white background and black text featured;
- content and features: a contact us link invited users to communicate with library staff, news/announcements of library activities and resources were available, and the term 'catalogue' was used to describe the online search tool for library stock items;
- new technology: none of the new technology features on the checklist were present on 50% or more library homepages;
- library mission and policy: a policy or legal statement was provided; and
- advertising: supplier products, systems and search features were advertised by name or branding.

These elements combine to form a general model for the design and content features of a UK university library website.

One measure used to determine the value that a university places on its library was the inclusion of a direct link to it from the corporate homepage. This study illustrated the fact that UK university libraries were not routinely allocated space on their university's homepage. It was much more usual for website visitors to find a link to the library from the university homepage by navigating a website index, consulting a dedicated sub-section for students, or by conducting a search. Depending on the characteristics of

visitors to the library website (i.e., their familiarity with IT) this may not constitute a major barrier to accessing the library website. However, at the very least it introduced an extended navigational path to the library website and may cause some frustration for potential visitors to the library website.

#### 4.2 Website technical dimensions

An adoption curve for web analytics determined by the presence of web analytics code on 130 UK university library websites over the period November 2007 to November 2010 revealed a steady increase in the number of libraries having such code, and a reduction in those which did not (Figure 4-13).

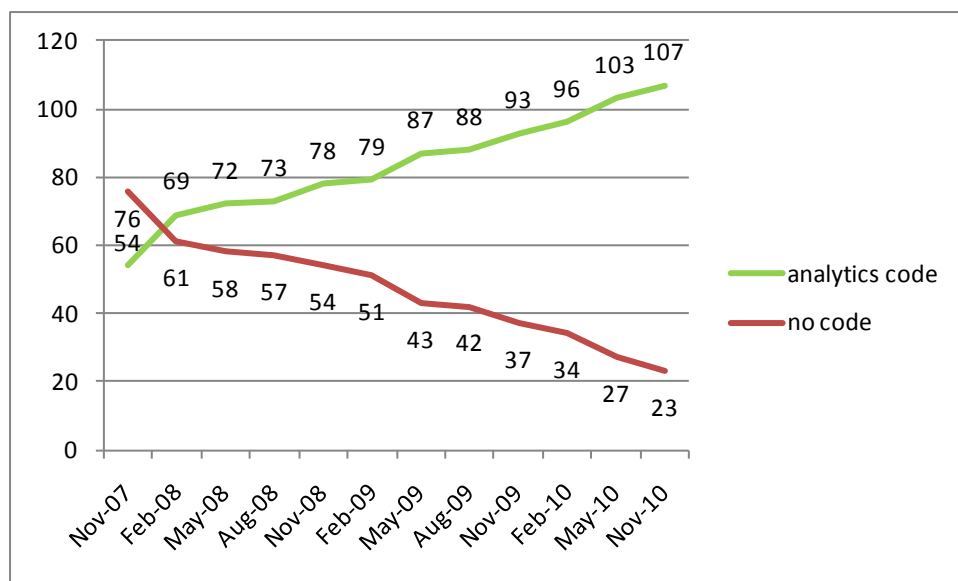


Figure 4-13: Web analytic adoption

The main analytic tools adopted over the same time period were Google Analytics, Sitestat and WebTrends. The use of Sitestat and Omniture fluctuated over this time period (Figure 4-14).

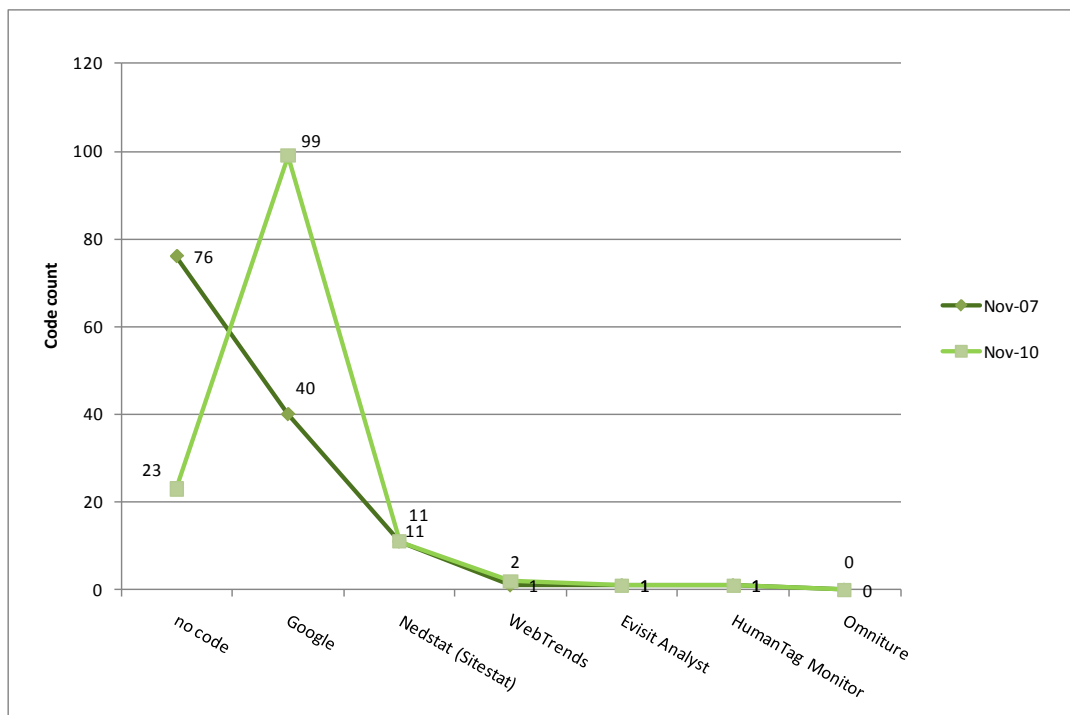


Figure 4-14: Distribution of analytic code over UK university library websites

Figure 4-15 shows a comparison of the market share for web analytic solutions used by UK university libraries in November 2007 and November 2010. The prominence of the free web analytic service provided by Google was evident, with over two-thirds (99 - 76%) of websites studied implementing Google Analytic code by November 2010.

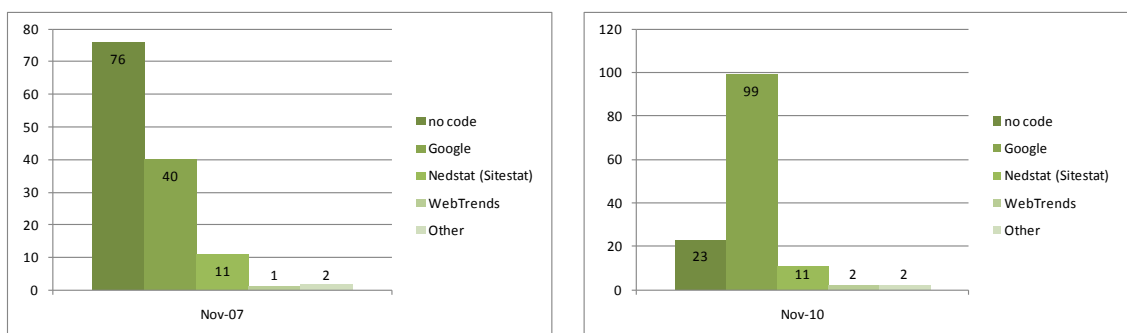


Figure 4-15: Market share for analytic code: November 2007 and November 2010

The dependence on one web analytics solution is illustrated in Figure 4-16. Of the library websites studied, only nine (18%) featured more than one web analytic code in November 2010.

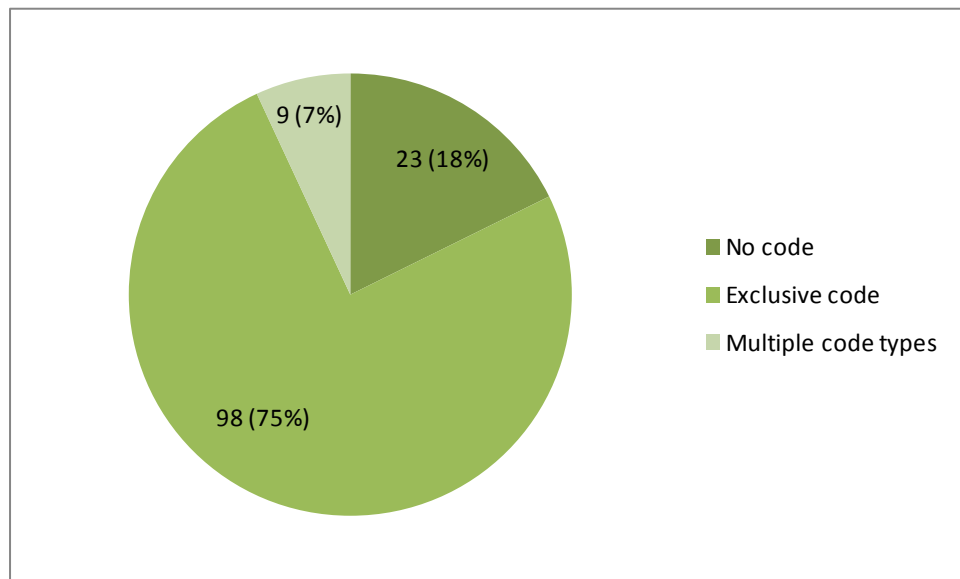


Figure 4-16: Distribution of single or multiple web analytic solution: November 2010

### 4.3 Conclusions

Standard library homepage features were not surprising although the relatively low uptake of new technologies was somewhat unexpected. There was evidence that some of the design and content conventions promoted by Nielsen & Tahir (2002) were adhered to by this group of libraries. One feature notable by its absence was the library mission/vision or goals. These were often found on American library websites (Kuchi 2006, p.50), although as is the case in this research, prominence was not given to the library mission by featuring it on the homepage. This could indicate that a deeper analysis of UK university library websites was required to confirm availability of such statements. It might also suggest that there was a difference in culture between American and UK libraries in terms of defining these statements, or making them available online. One limitation of this content analysis was that it focused on the homepage of library websites rather than addressing the content of the entire website. It was possible that some content and features investigated were available on other pages in these websites. However, visibility of services and resources were considered important in facilitating awareness and easy access for users.



The presence of web analytic code grew steadily over the time period investigated and by November 2011 82% (107) of library homepages featured such code. Google Analytics code was by far the most frequently observed with 76% (99) of libraries using this free software.

Having established core content, features and web analytics use, the following chapter considers approaches to website management and development. The literature, and this homepage content study, illustrated a clear connection between the presentation of features and content on library websites and the use of academic templates or university branding. To understand this connection further, and to gather data for analysis of librarians' experience of maintaining their library's website, a national survey of library website managers was undertaken. This survey provided an opportunity to establish the part that library strategy played in the provision of its websites, to see whether a mission/vision or goals were available internally and to explore methods adopted for gathering feedback from library website visitors to inform development.

## Chapter 5      National survey of UK university library web managers

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### *5.0 Introduction*

The objective of this national survey was to establish practices that were in place for managing and developing UK university library websites. The survey investigated organisational and management factors affecting library websites; methods adopted for gathering and analysing data on website use, as well as users' views on their libraries website; and the outcomes of analyses undertaken in respect of changes made to library websites. These data established UK university librarians existing approaches to website management including strategic dimensions. They revealed the scope of website visitor analysis, the take-up of web metrics and the stage these libraries had achieved with the implementation of a web analytics solution. The survey suggested the levels of sophistication in librarians' data analyses, the advantages and disadvantages in the methods used and associated management issues. It also revealed the ways in which web metric data were used by librarians in their efforts to provide an effective website.

#### *5.0.1 Research objectives*

Objective 2. To record and analyse UK university library website management and development practices, including strategic dimensions.

Objective 3. To evaluate the advantages and disadvantages of the methods used for establishing UK university library website effectiveness.

To achieve these objectives the online questionnaire focused on the following themes: demographics, website management and maintenance, usability studies, website statistics and data analysis, and any other comments in relation to the management and maintenance of library websites. Practitioner interviews provided an opportunity to

enquire about the context of a library website and its relationship to the university's website. More in-depth data on management, maintenance and website improvement practices were also gathered. In addition, interviewees were asked to consider future developments for their website.

### *5.1 Correspondence with potential survey respondents*

Responses to an initial email request for web manager contact details resulted in 11 replies giving details about the senders' situation and explaining why they were not able to take part in the survey. Themes included the influence of the university in the corporate website (six), pressures of work (six), that the survey was not applicable (four), library services were delivered through internal channels (two), the web manager post was vacant (one), no one person could complete the questionnaire (one), there was no access to tracking data (one), that performance indicators were derived from the university portal not the website (one) and that the library only had a minimal presence on the corporate website (one).

Following the release of the questionnaire an additional 35 email messages were received. The majority of comments related to staff roles and responsibilities (41) and these illustrated the variety and complexity of the ways in which library websites were managed and maintained. There also appeared to be a range of approaches to management and contribution of content to the website (14). The influence of the university was illustrated by comments on web servers, publishing systems, templates and in the awareness of responsibility at the institutional level (12). Data availability or collection (four), and libraries that were in the process of organisational change (two) were also factors. Lack of time and heavy project involvement were suggested as a reason for possibly not being able to complete the questionnaire (11). These indicators were suggestive of some of the themes emerging from the questionnaire. From this group, twenty-four individuals went on to complete the online questionnaire whilst 11 did not.

## 5.2 *Questionnaire results*

Detailed questionnaire response data are provided in Appendix G. The following analysis was based on responses to the questionnaire by all respondents regardless of library size and type. This approach was adopted so that a high-level overview of library website management, maintenance and development practices across the library sector could be established. In essence these data were discussed around a number of key themes derived from responses to the questionnaire. One disadvantage of providing such a general picture was that some of the specific issues facing libraries with similar characteristics, for example smaller or research intensive libraries, were not revealed. However, analysis of sub-sets of the survey data was undertaken and reported in the literature (Manuel, Dearnley & Walton, 2009; Manuel, Dearnley & Walton, 2010a; Manuel, Dearnley & Walton, 2010b).

Information from practitioner interviews was introduced as a means of providing a context for library websites, their audience, university influences, management practices, development activities, and future direction.

### 5.2.1 *Demographics*

Respondents were asked to provide the name of their institution. This information allowed for classification of responses, and ensured that follow up requests were not sent to individuals who had already completed the questionnaire. A response rate for the questionnaire was derived from this information. A total of 112 individuals were contacted with a request to take part in this research, 69 responses were submitted to the online survey instrument representing a response rate of 62%.

Some regional bias was seen in the spread of responses to the survey. The East Midlands and London areas attracted the poorest response rates. The pilot study provided detailed data on the views of EMUA library web managers. However, the views of web managers at London university libraries remain under represented.

When asked about their role in relation to the library website the largest group of respondents classified it as being that of webmaster/web administrator 34 (26%). The 23 respondents categorising their role as ‘*other*’ elaborated by providing an alternative definition of their role in the library, or in relation to their website. A number of respondents mentioned that they had more than one role in the delivery of their library’s website. Nine respondents’ role had a website content focus, eight were managerial, five mentioned web management, three were in a web group, three reported having a dual role in relation to their website, and one had a technical role.

### *5.2.2 University policy guidance, website management and website template*

One theme that emerged from the survey was the influence of the university on the library website. This was expressed in terms of university web policy, web group or committee and website template provision.

Many universities provided a steer for their web presence in the form of web policy. This overarching policy might offer useful guidance to all website managers at an institution. University policy was, therefore, thought to be worthy of consideration. Over half (43 - 62%) of questionnaire respondents reported that their institution had such a policy, while eight (12%) did not. Eighteen (26%) indicated that they were unsure whether their university had a web policy, which indicated a degree of lack of awareness in this area.

In comparison, a survey conducted by the Social Issues Research Centre (SIRC) of 134 web managers in UK higher education institutions revealed that 44% of institutions had a web strategy (SIRC 2009, p.26). This was a lower figure than that reported by library web managers indicating that their university had a web policy. This might be explained by the broader population being studied in the SIRC survey and the difference between strategy and policy.

Where university web policy was in place respondents were asked whether this policy impacted upon decisions made in relation to their library website. Thirty-three (77%) indicated that central policy influenced decisions made about their website. The range of

influences was expressed in the 32 free text comments. The number of responses here provided an indicator to strength of opinion in this particular area. Comments ranged from restrictions on library practices relating to style, publishing, editing and website development (60) or that there was minimal influence from the university (three) (Figure 5-1).

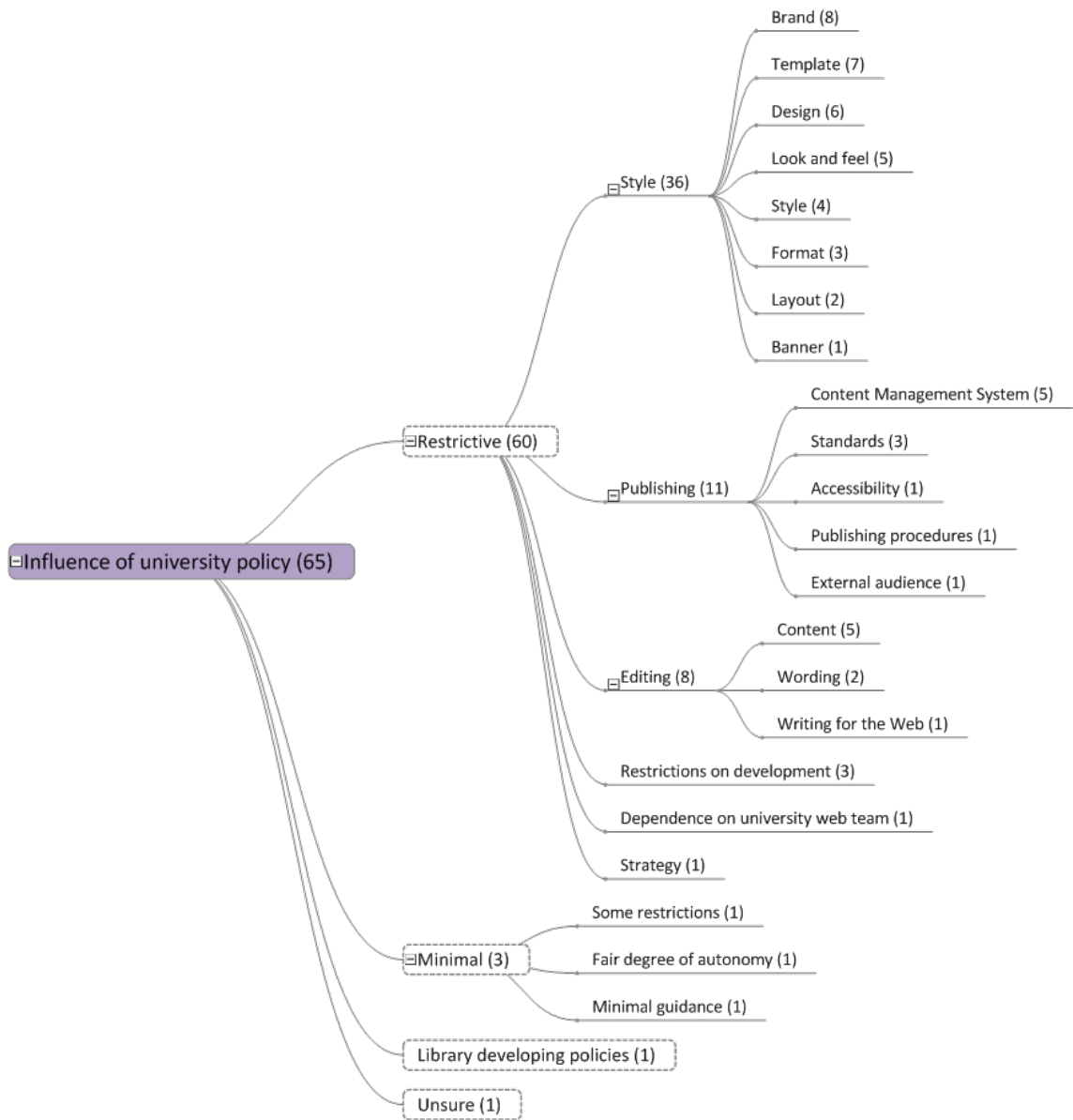


Figure 5-1: Influence of university policy on the library

The provision of a standard website template was seen to be another area of university influence over the library website. Sixty-two (90%) indicated that their university made a website template available to departments. Furthermore, where universities had formulated a web policy they were more likely to provide a website template (Figure 5-2).

		Does your University provide a web template for departments to follow?			
		Yes	No	Unsure	Total
Does your University have a web policy?	Yes	38	4	0	42
	No	8	0	0	8
	Unsure	15	1	2	18
	Total	61	5	2	68

Figure 5-2: University website policy/website template

Where a central website template was provided its use was compulsory at 43 (69%) institutions; this represented a figure of 62% of all questionnaire respondents. This illustrated the fact that over half of the respondents to the questionnaire operated a library website within the parameters of a university derived website template. In addition, a further 17 (27%) noted that their university encouraged the use of their website template. When combining responses where template use was either mandatory or encouraged, and calculating a percentage based on the total number of questionnaire respondents, a figure of 87% was arrived at. Thus, the majority of librarians reported that the preferred option for website design was the use of a university standard template.

A number of other studies have demonstrated that university website templates were evident. The SIRC (2009, p.28) study referred to earlier enquired about the presence of a 'compulsory standard system', one where style, content and branding were defined at the institutional level, and where departments complied with this rule. In this example 43% of their survey respondents fitted into this model. This figure was considerably lower than the 62% of the total sample of library web managers. Once again, any difference in populations must be taken into account when considering these figures.

In a study of US Higher Education institutions' webpages Peterson (2006) studied website template use at a random sample of 216 American colleges and universities. The parameters for academic template use were defined such that pages in the website were visually similar with standard elements, such as a banner and navigation section (Peterson 2006, p.218). Findings of this study indicated that 94% of the colleges and universities used an academic template. The use of a template for library websites at these institutions was recorded at 50%. Although these findings indicated a higher number of universities providing a website template, the take-up by libraries was lower than that reported in this survey of UK university libraries. However, university website template use was evident.

There were benefits and drawbacks for web managers where a university website template was available. It ensured a standard look-and-feel across websites at the institution and users benefited from consistent design and navigation features and their placement. In a survey of web developers at US academic libraries of all sizes and types Connell (2008, p.128) reported that there were some issues expressed in the survey relating to university mandates and the library website. One respondent noted that library staff were able to use an alternative to the university's required template. Another noted that they were not able to provide input to their university template and, therefore, they had to adopt a website with reduced usability. This respondent also noted that there were issues regarding permissions to change their website design and the different needs of a library website compared to others at the institution. Concerns expressed were summarised as follows:

*To librarians and other Web designers, it may seem obvious that a library Web site is complicated and needs to be regularly updated; requiring more autonomy and control than most other campus departments, but this is not always understood by campus Web committees. For that reason, it is important for the library to be represented on, or have a close working relationship with, campus Web committees so that library interests are not forgotten (Connell 2008, p.128).*



Where a central website template was provided by the institution (62 - 90%) the effect it had on library staffs' ability to change their websites design and develop their website is illustrated in Figures 5-3 and 5-4.

		How much control does the library have over its site design?			
		Full control	Some control	No control	Total
Is the Library obliged to use the University web template?	Yes, it's mandatory	1	29	13	43
	No, but it's encouraged	2	15	0	17
	No, it's purely voluntary	1	1	0	2
	Total	4	45	13	62

Figure 5-3: University website template use/library website design control

It was rare for library website managers to have full control over the design of their website where use of the university website template was mandatory. It was more likely that some control over design could be exerted by a library having to adopt a university website template (29) or that changes to the design were not an option ('no control', 13). Where use of a central template was encouraged, web managers reported having some control over webpage design (15).

The situation relating to the presence of central website templates and web managers' abilities to control the development of their website was slightly different, although university control remained evident in some cases.

		How much control does the Library have over its site development?			
		Full control	Some control	No control	Total
Is the Library obliged to use the University web template?	Yes, it's mandatory	7	29	7	43
	No, but it's encouraged	8	8	1	17
	No, it's purely voluntary	1	1	0	2
	Total	16	38	8	62

Figure 5-4: University website template use/library website development control

Where central template use was mandatory, respondents reported having either some control (29) or full control (seven) over the development of their website, whilst seven respondents could not develop their own website. When central website template use was encouraged at the university, web managers retained full (eight) or some (eight) control

over their website development. Only one respondent reported having no control over development in this situation.

In terms of a web manager's ability to direct the design and development of their library website, mandatory use of a corporate website template could be regarded as an external influence upon the library. Respondents reported advantages and disadvantages to central template provision with some website development difficulties and frustrations encountered as a result. This external influence may be mitigated where UK university libraries had a presence on their university web group/committee.

Respondents were asked if their library was represented on their university web group/committee and 33 (48%) reported that they had such representation. As Connell (2008, p.128) noted above, this may have provided these individuals with an opportunity to represent their library and its visitors in any decision making processes. However, the 15 (22%) libraries not represented on their university web group/committee did not have an opportunity to influence decision making, at least through this formal channel. In addition, 13 (19%) respondents indicated that their university did not have a web group/committee and 7 (10%) were unsure whether such a group existed.

### *5.2.3 Library website policy and strategy*

The survey illustrated the fact that for respondents' libraries the process of website management may be less formalised than that of their institution. This was evidenced when library website policy, strategy, and aims and objectives were considered. Information on these areas was gathered by enquiring whether the library had any of the following strategic tools: a web policy document (management and maintenance guidelines), a website strategy (direction and planning) or website aims and objectives (Figure 5-5).

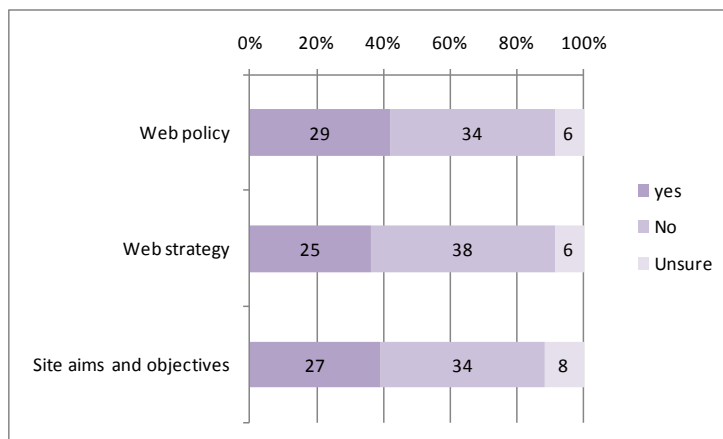


Figure 5-5: Library website strategy tools

A website policy document that set out management and maintenance guidelines was available at 29 (42%) respondents' libraries. Website strategy providing direction and planning was present at 25 (36%), whilst website aims and objectives were available at 27 (39%) libraries. It was considered possible that library policy documents were not devised where university policy documents were available. This may have been the case for the 18 respondents who indicated that their university had a website policy but their library did not (Figure 5-6). However, this was not the case for respondents who noted that their library did not have a website policy and were either unsure whether their university had such a policy (12) or were aware that their institution did not provide policy in this area (four).

		Does the library have a web policy document (management and maintenance guidelines)			
		Yes	No	Unsure	Total
Does your University have a web policy?	Yes	23	18	2	43
	No	3	4	1	8
	Unsure	3	12	3	18
	Total	29	34	6	69

Figure 5-6: University website policy/library website policy

Formal policy documents are not the only way to manage a university library website. Libraries not having these documents might have adopted less formal guidelines, or might not be prescriptive in the way they approach website management.

Other surveys showed similar findings, for example, a survey of ARL webmasters, revealed that two-thirds were guided by written library policies and almost 60% had university policies to refer to (Taylor 2000, p.118). In a survey of 224 small American university and college libraries 52% indicated that their institution had policies to govern their website, 21% stated that their library had developed their own policies and a further 36% had informal but no written policies (Traw 2000, p.15). Hendricks (2007) surveyed academic library webmasters via three mailing lists, two of these were aimed at an American audience while the third had a worldwide membership. Website policy was available at 54% of libraries, 93% of library website policies conformed to university website policy and 19% of libraries followed their university's website policy (Hendricks 2007, p.143).

#### *5.2.4 Library website governance and staffing*

This section considers the methods by which library websites were governed and steered. A range of approaches to library website management were apparent with management under a group or committee structure being the most common (24 - 35%). Designating this responsibility to a solo manager was evident in 17 (25%) cases. Those managing the library webpages within a converged service numbered 13 (19%). Where respondents (15 - 22%) indicated that another option was in place at their library, a mix of group/committee options were outlined. Policy formation and website reviews were conducted by a group whilst day-to-day management was handled by an individual. A solo manager might operate with a support network of colleagues (Figure 5-7).

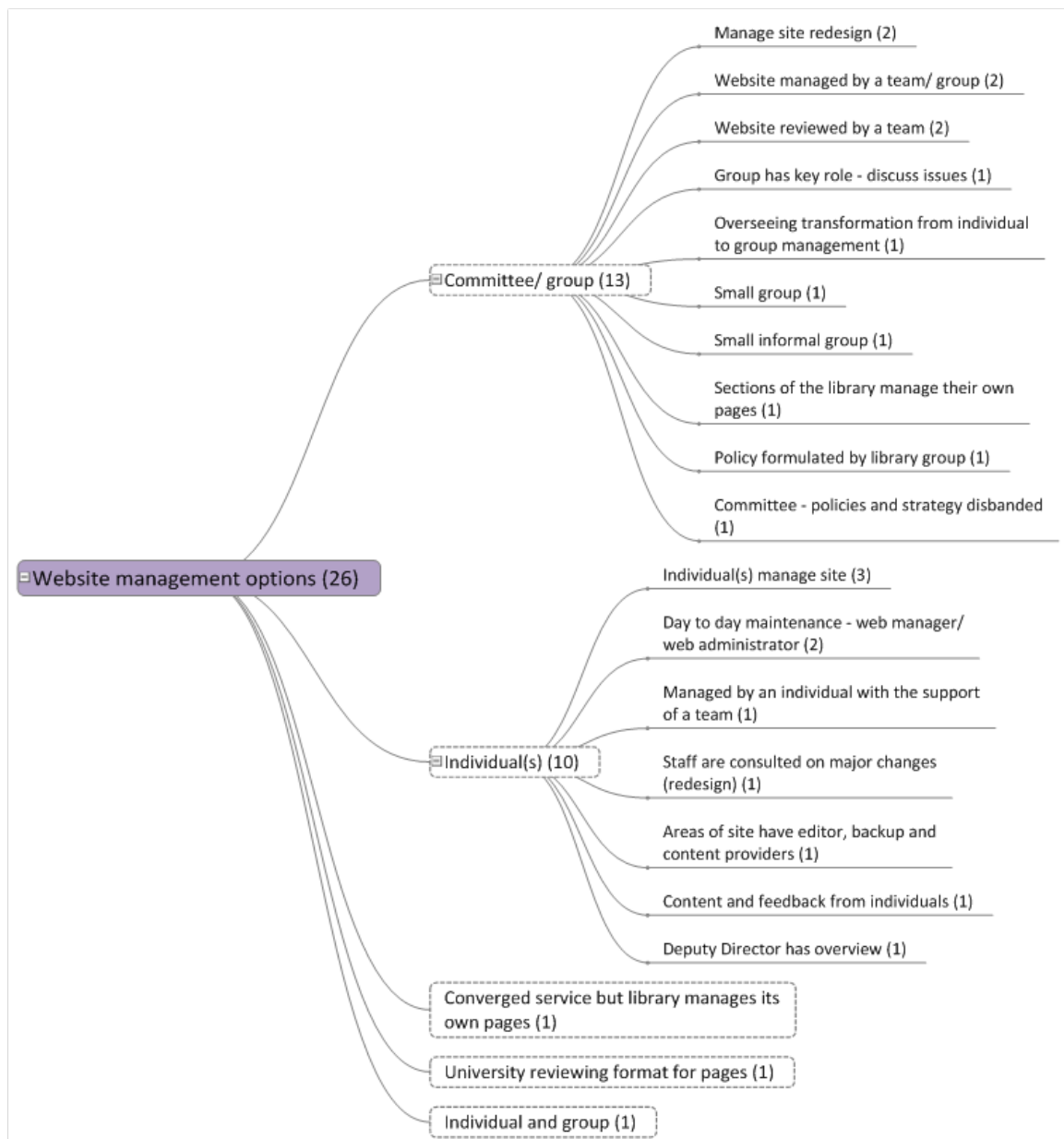


Figure 5-7: Library website management: Other category responses

Traw (2000, p.12) discovered that website responsibilities were administered by a team/committee for 33% of respondents, compared to 31% being the responsibility of the library webmaster. In her survey of library webmasters, Taylor (2000, p.119) found that 81% worked with a web committee. Hendricks (2007, pp.142-143) reported a lower figure of 29% working on a web committee or team, although 64% of respondents stated that their library had a web advisory committee.

Respondents (24 - 35%) who reported that their website was managed under a group/committee structure were asked two additional questions about this aspect of website management. Firstly they were asked to select how many people comprised the library web group/committee from pre-defined categories. The number of staff on the library web group varied, but most appeared to favour between four/five (10 - 42%) or six/seven (six - 25%) individuals. The median number of staff on the library web group reported in Taylor's (2000) survey was eight. Practitioner interviews identified a preference for smaller web or working groups as larger groups tended to delay working processes as members had differing views on what should be done with the website.

Representation on the library web group/committee from a variety of staff grades was also established (Figure 5-8).

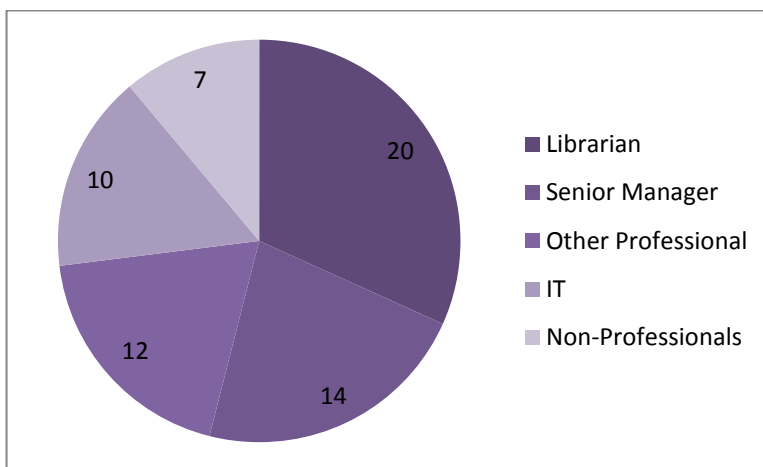


Figure 5-8: Staff groups represented on the library web group

Professional staff formed the majority representation with the inclusion of librarians (20 - 83%), senior managers 14 (58%), and other professionals 12 (50%). Information technology staff were present on 10 (42%) of these groups. This figure might be because information technology staff were not part of the library staff structure or university staff had control over technical aspects of the library website. In addition, a computer science qualification might not have been a requirement for those involved in creating, maintaining or developing a library website. Qualified librarians might have studied

website management and development and many contributors to the library website were self-taught. Prior experience in the role would also qualify a person in the execution of their website related duties. Non-professionals were only present on the web group in seven libraries (29%). This may be appropriate as the remit of the library web group/committee was likely to be providing website direction and policy.

A range of skills were available for library website management and development tasks (Figure 5-9).

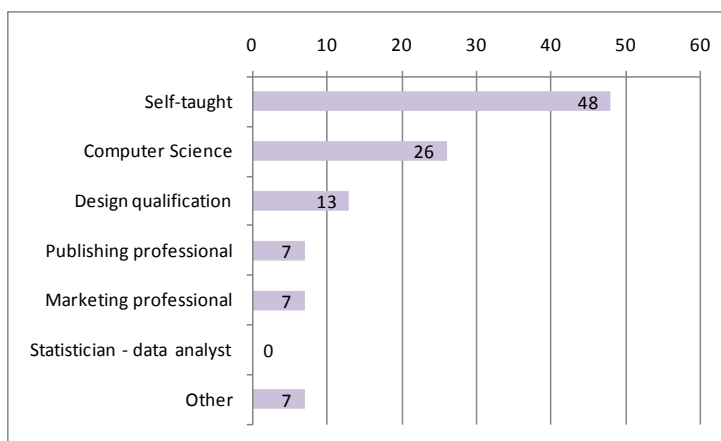


Figure 5-9: Staff backgrounds

The vast majority of library staff contributing to their website had a library qualification (62 - 90%). Those having a computer science qualification were much less frequently represented (26 - 38%), as were those having a design qualification (13 - 19%) and over half were self-taught (48 - 70%). A number of skills gaps were identified in the responses. Marketing and publishing professionals were poorly represented with seven (10%) each and no library reported having a statistician/data analyst evaluating their library's website. The latter may have some bearing on responses to questions about gathering and analysing data from the library website. Only one respondent noted in their free text comments that their library was able to call upon a member of staff's numerical skills for statistical analysis. Additional skills available included: trainer (two), project manager (one), prior website experience (one), publishing (one), market research (one), content management systems (one), art and design (one), business information systems

(one) and numerical (one). One respondent noted that the university provided training in this area.

Evans (1999, pp.309-310) conducted a survey of very large (7,500+ Full Time Equivalents [FTEs]) American college and university website authors in 1997 to gather data on their skills and training. The majority of respondents reported being self-taught (94% of librarians and all non-librarians) (Evans 1999, p.312). When compared with this study the practice of having a self-taught website worker has seen a drop in numbers.

Connell (2008, pp.124-125) enquired about the library website team where libraries managed the design of their own website. In 48 cases (49%) an individual managed the design and where a team was involved it was more usual for this team to be small. As with other surveys, a large percentage of those working on the library website reported being self-taught (66 - 60%).

The majority of respondents to Taylor's (2000, p.116) survey were self-taught (83%), while 31% had taken workshops or seminars to acquire HTML skills. Respondents to Hendrick's (2007, p.141) survey reported that their HTML skills were acquired through training or classes (37%); otherwise they were self-taught in their role (22%). A comparison of these survey results is provided in Table 5-1.

Category	Author, year and region studied				
	Manuel 2009 - UK	Connell 2008 - US	Hendricks 2007 - US/worldwide	Taylor 2000 - US	Evans 1999 - US
	Frequency expressed as a percentage				
Library qualification	89.86	82.7	>60	78.2	78.22
IT qualification	37.68	21.8	-	10	17.21
Self-taught	69.57	60.0	21.7	83	95.08

*Table 5-1: Study findings comparison*

Although these surveys sampled different audiences from different countries some observations can be derived from these data. For example, the numbers of staff with IT qualifications having an input into the library website showed an upward trend. A relatively high proportion of individuals contributing to their library website categorise



themselves as self-taught, although overall this trend was in decline. This indicated a gap in formal education courses or that work on the library website was undertaken by enthusiasts who had acquired their skills through less formal routes. The role of a librarian in their library's website also appeared to be an upward trend. Perhaps the opportunities afforded by working in the academic library sector were not well publicised, or did not appeal to computer scientists.

Free text comments on library website management numbered 22. Themes highlighted included: the influence of the university on the way the library managed its website (17), library website management practices (17), staffing (roles, responsibilities and development) (13), that some libraries were in a period of transition with their website (four) and the library website was not the only delivery mechanism for information and services (four).

#### *5.2.5 Methods of website evaluation*

The ways in which web managers and librarians determined the use of their websites and the ways in which any feedback informed the development process was evaluated. It was clear that library staff were actively engaged in user studies with fifty-two (75%) reporting that they were. Under a quarter (14 - 20%) of libraries were not engaged in this activity. In comparison, 82% of higher education web managers responding to the SIRC questionnaire indicated that user experience or behaviour was monitored (2009, pp.46-47). This was a slightly higher figure than that of library web managers.

Where user studies were conducted, a range of methods were adopted (Figure 5-10).

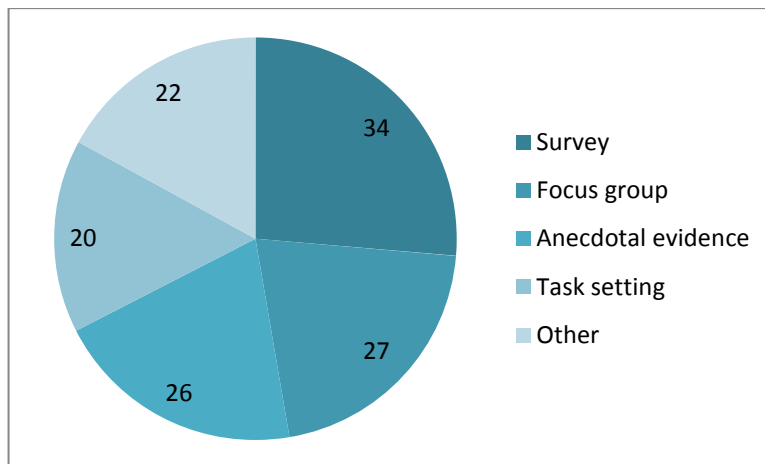


Figure 5-10: User study methods adopted

The most popular method was user survey 34 (65%), followed by focus groups 27 (62%) and anecdotal evidence 26 (50%). Each of these methods had inherent strengths and weaknesses. However, the options adopted illustrated that librarians drew upon a range of formal and informal approaches to the task of gathering feedback from their website visitors.

The SIRC survey enquired about three methods of website inspection. Of these, analytics/website statistics proved the most popular option as all respondents adopted this method. User/usability testing was undertaken by just over 70% and student survey by 52% (SIRC 2009, p.47). These categories did not precisely match the methods enquired of library web managers in this questionnaire but it was possible to make some comparisons. Regarding statistical evidence of website use, 46 (67%) of respondents' libraries used web server log file data or web analytics. This was considerably less than the 100% recorded in the SIRC questionnaire. On the other hand, library web managers were more likely to gather intelligence from surveys (65%) compared to 52% of higher education web managers in the SIRC survey. User/usability testing involved a number of options and the closest match to this category gathered in this study was task setting. Compared to the 70% involved in user/usability testing, only 38% of respondents' libraries engaged in task setting studies. Data were not gathered from library website

managers to confirm whether these task setting studies involved observation of users carrying out the tasks or whether task questions were included in a survey.

Connell (2008) investigated US academic library usability testing and was surprised to find that under half (44 - 47%) engaged in this activity which represented a slightly higher figure than for UK library website managers.

An additional set of options for conducting user studies was revealed in the free text comments section. From the 23 comments, statistical analysis emerged as the dominant theme with 18 mentions. Feedback forms were adopted by three, as were meetings or discussions. Only one respondent cited usability study and one noted that they would be undertaking studies following the implementation of a new system and department merger.

One interviewee referred to the 'user journey' which raised interesting questions relating to the use of the following methods:

- a. persona: archetypal users, their profile, reasons for using the website and possibly standard navigational paths to resources;
- b. metrics: actual user journey; and
- c. eye tracking studies: detailed analysis of the gaze of a website visitor to assess their visual interaction with the website.

The use of metrics was mentioned (17 - 33%) but creating user persona and eye tracking studies were not mentioned in either the questionnaire or practitioner interviews. The case studies developed at a later stage in this research may reveal the use of these forms of website user elaborations and studies.

When asked if the intelligence gathered through consultation processes were used to inform changes to the library website 46 (88%) indicated that it was.

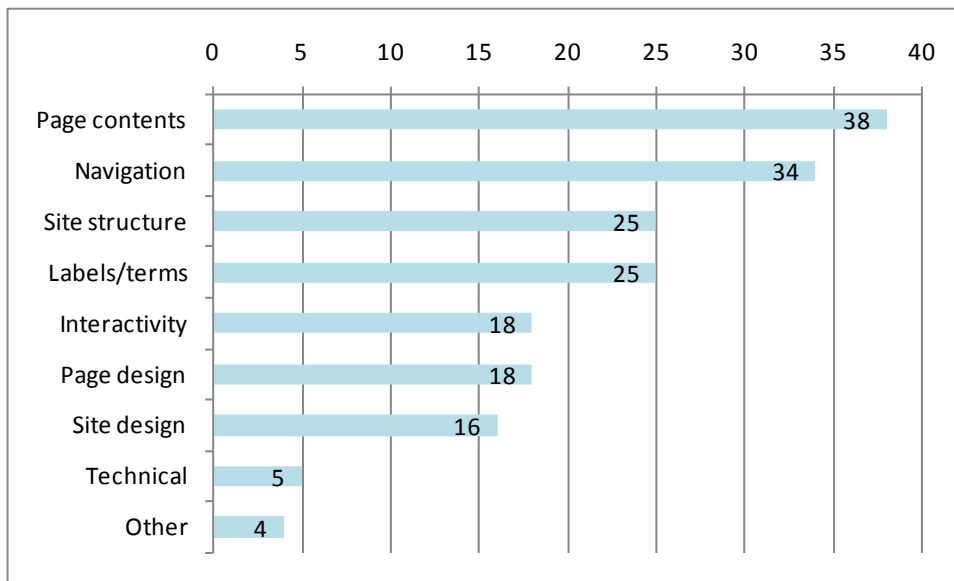


Figure 5-11: Website changes in response to feedback

Specific changes made in response to user feedback included: page contents 38 (83%), navigation 34 (74%), labels/terms 25 (54%) and website structure 25 (54%) (Figure 5-11). Aspects least likely to be changed in response to user feedback were interactive elements, such as blogs (18 - 39%), and technical aspects to the website, such as RSS feeds (five - 11%). There were eight free text responses to this question and they duplicated some of the areas covered in the question as well as introducing a number of new themes. These were: changes to design (two), all areas commented on (two), website structure (one), information priorities (one), new process under review (one), a case for design and structure changes has to be made to the university web team (one). The ability to make changes may be influenced by the presence of a university website template or other factors determined by the content management system.

Another way of establishing website interaction was through analysis of usage data. Two methods were enquired about in the questionnaire, web server log file data and web analytic data. The number of respondents reporting the use of these methods was identical (33 - 48%). In addition, twenty respondents' libraries (29%) opted to make use of both methods. Only nine respondents (13%) were unsure whether web server log file data were being used in their library and for web analytics this figure was eight (12%).

One factor in determining the use of any method was in the time required to develop working practices and experience. The use of server log file data was found to be a more established method as it had been used for two years at 27 libraries (82%) compared to web analytics at 17 libraries (52%). The adoption of web analytics was seen to be greater than that of server log files for time periods under a year. This may reflect the fact that web analytics was a relatively new method and a greater number of libraries were exploring its use when compared with new adopters of web server log file analysis. However, overall usage of web analytics was below the 50% mark.

In comparison, respondents to a worldwide survey of web analytic practitioners and consultants recorded that 58% of the 570 web analytics end-user respondents had two or more years' experience of using web analytics tools (Peterson & Bayriamova 2007, p.14). A more recent survey conducted by Forrester Consulting (2009, p.10) reported that 53% of enterprise organisations had been using their web analytics solution for more than two years. These two figures were broadly comparable with the libraries in this study despite the differences in these populations.

Where web analytics were used, the predominant solution adopted was a freely available tool (24 - 67%). One respondent reported in the '*other*' option that their library made use of Google Analytics, this brings the total to 25 (76%). Reasons for making use of a free solution may be driven by financial constraints. This assumption was backed up by the relatively low figure reporting the use of a fee-based solution (six - 18%), a further three (9%) used a hosted service. In addition to the Google Analytics user, three more respondents selected the '*other*' category response. They indicated that they were unsure which system was used but suspected it was freeware (one), the tool was operated by the web office and so unsure which category to select (one) and one respondent was unsure.

Peterson & Bayriamova (2007, p.13) found that 77% of companies using web analytic tools had a licensed solution from an analytics vendor, 22% used freely available tools while one percent hired the services of a web analytics company. Another study revealed that 53% of organisations used free systems as their primary web analytics tool and 71% used a free tool in some capacity (Forrester Consulting 2009, p.5). This study found that a

higher percentage of companies had adopted a free solution compared to Peterson & Bayriamova's study. As the Forrester Consulting study was commissioned by Google, this may have influenced responses.

Understanding the use of their website was important to respondents. Along with other methods adopted, web server log files (27 - 82% '*agreed/strongly agreed*') and web analytics (29 - 88% '*agreed/strongly agreed*') helped in this endeavour.

When asked what data analysis activities they were involved with the primary uses of both types of data were reported to be for following general trends (25 - 76%). These data informed change to the library website: web server log file 15 (46%) and web analytics 12 (36%). However, there were few examples of in-depth analysis of the data being undertaken for either web server log file data (three - 9%) or web analytic data (three - 9%). Relatively few respondents' libraries were looking at key performance indicators eight (24%) for either method. In the free text comments one respondent indicated that web server log file data informed website redesign, web analytic data were used to derive a list of top 10 pages.

Question	Category	Method	
		Frequency (Percent)	
		Log file	Web analytics
Q.44/72	Data used for guidance information	29 (88)	30 (91)
Q.45/73	Data for website targets	8 (24)	13 (40)

Table 5-2: Data provides guidance or data for targets set for the library website

Respondents' '*agreed/strongly agreed*' metric data were more likely to be used for general guidance than for establishing data for targets set for the website (Table 5-2). Twenty-six percent of web analytics end-users in business reported only using their web analytic data for general guidance (Peterson & Bayriamova 2007, p.19). This was a slightly lower percentage than that reported by UK university library web analytic users; although respondents to this survey were given the opportunity to select additional options beyond the provision of general guidance information.

Setting website targets was more likely to occur where web analytic software was adopted. However, the high percentages responding ‘*neither agreed nor disagreed*’ (server log file 16 [48%] and web analytics 10 [30%]) indicated that the practice of setting website targets was not well established in UK university libraries. Metric data were more likely to be viewed as complementing other forms of data analysis. For web server log file data the figure for respondents who selected ‘*agreed/strongly agreed*’ was 22 (67%) and for web analytics users the figure was 25 (76%).

The benefits reported in undertaking data analysis were more likely to be found in having actionable data from server log files (20 - 60% ‘*agreed/strongly agreed*’) and web analytics (21 - 63% ‘*agreed/strongly agreed*’). In relation to this one respondent commented:

*The data is real, therefore useful to inform discussion about what to do with the web. For example, everyone has some opinion on what the most “important” parts of the website are, but the stats don't lie about how much of our traffic goes to say the pages on e-resources.*

Question	Category	Method	
		Frequency (Percent)	
		‘agreed/strongly agreed’	
		Log file	Web analytics
Q.51/80	Data overload	14 (42)	13 (40)
Q.54/83	Staff lack time to analyse	19 (58)	23 (70)
Q.53/82	Staff lack skill to make the most of the data	14 (42)	16 (48)

Table 5-3: Potential drawbacks to server log files and web analytics

When asked for their views on whether the amount of data generated was overwhelming, 14 (42%) of those using web server log files ‘*agreed/strongly agreed*’ that data overload was an issue (Table 5-3). The figure for those using web analytics was slightly lower, 13 (40%).

Having time to analyse metric data was more of an issue with web analytics than web server log files (Table 5-3). This could be attributed to the fact that web analytics was a relatively new method and there is a learning curve associated with its use in libraries. In

addition, web analytic data are richer than web server log file data and therefore more time consuming to analyse. However, twice as many respondents expressed a greater strength of opinion that staff did not have the time to analyse web server log file data 10 (30%) selected '*strongly agree*', compared with web analytic data five (15%). Although having the time to analyse web analytic data was thought to be an issue, feelings of being overloaded by these data were marginally less than with web server log file data.

Fewer respondents '*agreed/strongly agreed*' that staff lacked the skills to make the most out of the server log data 14 (42%) than web analytic data 16 (48%). This may also be due to the fact that web analytics use was at a relatively early stage of adoption in these libraries and there was a greater range and more detail in analytic data.

Views on the statement: "*There are issues with knowing how best to use the data for making decisions about the site*" showed that of those using web server log files, 24 (73%) '*agreed/strongly agreed*' that this was the case. The figure for those using web analytics was 19 (58%). The characteristics of these two types of data were very different and this might be one reason for differing views on how to use these data in decision making. Addressing the issue of how to take these data forward may act as a catalyst for library web practitioners in making strategic use of their data. US web analytics end-user respondents to Peterson & Bayriamova's survey (2007, p.21) appeared to be much more certain about how to embed their data into decision making processes. This was indicated by the eight percent who reported that they were unsure how to integrate their web analytic data into their decision-making processes, while 26% used their data for general guidance. The difference between web analytics use in business and that of the education sector may be attributed to a marketing focus with return on investment being paramount to the success of a company.

Data analysis may not be as much of an issue as how to interpret these data, what these data revealed about website usage, what this intelligence meant for the library website and how this tied in with the processes of strategy formulation and planning. There was a



greater range of web analytic data compared to web server log data which brought with it a greater degree of complexity in analysis.

More libraries used web server log file data 15 (45%) to inform changes to their website than web analytic data 12 (36%). When compared with the 75% of libraries making changes to their website in response to other methods (surveys, focus groups, task setting or other), it was clear that utilising metric data to inform website change had a way to go before it approached this figure. However, the figures for web server log file data and web analytics were taken in isolation whilst the figure for alternative methods was an aggregate. It must also be borne in mind that when asked about methods of investigating website use, 17 respondents noted that they used statistical information of one form or another in the ‘*other*’ response category. Despite this, it appeared that the figures for metric data informing website change were relatively low.

#### 5.2.5.1 Reporting practices

Library staff created reports for web server log file data (16 - 48%) and web analytic data (21 - 64%). The higher figure for web analytic data might reflect the ease with which reports could be produced using this method. It could also be a result of having greater access to web analytic tools for generating reports, compared with access to web server log analysing packages which may be controlled at the institutional level.

There was a discrepancy in the data relating to the number of libraries producing reports and in the fact that greater numbers of library staff were identified as report creators (Table 5-4).

Question	Category	Method	
		Frequency (Percent)	
		Log file	Web analytics
Q.35/63	Reports are produced	15 (45)	17 (52)
Q.37/65	Library staff create reports	16 (48)	21 (63)
Q. 37/65	University computing staff create reports	15 (45)	6 (18)
Q. 37/65	Reports are provided by the university web group	4 (12)	7 (21)

Table 5-4: Report creation

University computing staff were more likely to be involved in creating reports based on web server log file data 15 (45%) compared to web analytic data six (18%). This may, or may not, be an issue for library web managers but it might indicate a number of constraints in relation to web server log file reports. For example, library web managers might not have had a say in the data included in the reports, the software used for analysis, the presentation of these data or its reliability. In short, the reports may not have included the data that library web managers were looking for to inform change to their website. The following examples taken from free-text comments to the questionnaire illustrated this point:

*I am unable to request targeted data for areas of the website I would like to investigate further. Logs are kept by the computing service and not released so that processing can be done on an ad hoc basis. The reports give general usage data that only serves to confirm general trends I am already aware of.*

*Computing staff collect the data so the library team is somewhat removed from the process.*

*The logs provided by our IT are in summary only and not worth analysing.*

Similar issues were noted by some respondents when providing reasons for not monitoring website use:

*Lack of usable statistics - module used by the university does not give hit rates etc.*

*We find them of limited use but are moving to Google Analytics which might provide more useful data.*

*No information from University web management about usage.*

In a relatively small number of cases page owners conducted their own analysis: web server log file five (15%) and web analytics six (18%). This might indicate a policy of inclusion with page owners being able to assess the pages they are responsible for, and possibly in having a role in taking their development forward. One interviewee noted that there was an issue with establishing a sense of ownership of webpages. Providing content creators with information on the use of their webpages might be one way of addressing this issue. However, as survey and interview respondents noted, the time to analyse activity on their webpages was limited so providing webpage owners with reports on the use of their webpages would place an additional burden upon them. The practice of offering webpage owners reports on usage might be used in conjunction with a more centralised analysis and the development of strategy.

The university web group (or similar) provided a data reporting function for web server logs five (15%) or web analytics seven (21%). Analysis of web analytic data was only provided by an external company for one respondent. Outsourcing to an external company was not evident for web server log file data analysis. One respondent to the web server log file section did not answer this question.

A number of respondents indicated that another practice for reporting on data was in operation. In relation to web server log file data seven comments were provided around a number of themes. Comments focused on the source of data for reports (six), that data informed website change (one) and one was unsure. For web analytics three comments were provided on the following themes: the web manager provided reports (one), only a small amount of the data were used (one), no time to analyse all data (one), unsure (one), and repeated question (one).

Once reports were created they followed a number of routes to a variety of library staff. Reports on these data were provided to management as a general report with equal frequency for web server log data and web analytic data 10 (30%). Specific performance reports were given to page owners (server log file data eight [24%] and web analytics seven [21%]), or for targeted teams (server log files seven [21%] and web analytics 13 [40%]). The ease with which custom reports were created by web analytics tools

might have had a bearing on this. One respondent did not provide an answer to this question for web server log files and two respondents opted to leave this question blank in the web analytics section.

In total 10 free text comments were provided for web server log file data and eight for web analytics. Where another practice was reported in respect of web server log files comments related to the timing (10), purpose (two), audience (one) and delivery mechanism (two) for reports. Three respondents noted that reporting was not undertaken, one that it was an iterative process, one that feedback informed development and one was unsure. For web analytics themes related to the timing (four), purpose (three), audience (two) for reports. One noted that reports were created but not disseminated, one that reports were not provided and one was unsure.

An in-depth study of web analytics use within a large international airline based in the UK showed that a wide range of user-friendly reports were produced including a monthly summary, monthly dashboard, weekly dashboard, post implementation analysis (data on a marketing campaign), as well as other occasional reports. These reports contained a variety of metrics targeted at a range of staff and designed to help the company to understand their website's success (Phippen, Sheppard & Furnell 2004, pp.287-289).

#### *5.2.6 Use of data gathering methods*

Web server log file data and web analytic data revealed different information about website traffic. Due to the inherent differences in these data one might assume that different approaches to the implementation of systems and analysis of data were required. To discover whether this was the case in libraries, the questionnaire included duplicate questions for both methods. In this way, direct comparison of responses for each method was facilitated. Analysis of responses illustrated that adoption, implementation, analysis and reporting of web server log file and web analytics were not as divergent as was initially expected.

From the sets of questions about the benefits and drawbacks in the use of server log file data and web analytics, a mapping was devised by taking the three highest scores for each category to determine strength of opinion for a number of pre-defined statements. From these mappings it was possible to identify areas where opinions converged, as well as areas of divergent thinking.

The majority of respondents ‘*agreed/strongly agreed*’ with all the statements on the benefits of web server log file data and web analytics (Table 5-5). They were easy to implement, helped to understand website use, complemented other data, provided general guidance information and actionable data. There was only one notable exception, the largest group of respondents: 16 (48%) for server log files and seven (21%) for web analytics ‘*neither agreed nor disagreed*’ that: “*Web server log file analysis/web analytics provides data for targets set for the library website*”. As noted earlier, advanced web analytics may not be being used in these libraries at present.

<b>Strength of opinion</b>	<b>Method: Server log files</b>	<b>Method: Web analytics</b>
<i>Strongly agreed</i>	<ul style="list-style-type: none"> <li>helped the library to understand the use of its website eight (24%)</li> <li>was easy to implement seven (21%)</li> <li>provided general guidance information five (15%)</li> </ul>	<ul style="list-style-type: none"> <li>helped the library to understand the use of its website 11 (33%)</li> <li>was easy to implement 10 (30%)</li> <li>provided general guidance information seven (21%)</li> </ul>
<i>Agreed</i>	<ul style="list-style-type: none"> <li>provided general guidance information 24 (73%)</li> <li>helped the library to understand the use of its website 19 (58%)</li> <li>complemented other forms of data analysis 18 (55%)</li> </ul>	<ul style="list-style-type: none"> <li>provided general guidance information 24 (72%)</li> <li>helped the library to understand the use of its website 18 (55%)</li> <li>complemented other forms of data analysis 18 (55%)</li> </ul>
<i>Neither agreed nor disagreed</i>	<ul style="list-style-type: none"> <li>provided data for targets set for the website 16 (48%)</li> <li>easy to implement 12 (36%)</li> <li>complemented other forms of data analysis 12 (36%)</li> </ul>	<ul style="list-style-type: none"> <li>provided data for targets set for the library website 10 (30%)</li> <li>was easy to implement seven (21%)</li> <li>provided the library with actionable data seven (21%)</li> </ul>
<i>Disagreed</i>	<ul style="list-style-type: none"> <li>easy to implement three (9%)</li> <li>provided the library with actionable data two (6%)</li> <li>the remainder were one or zero</li> </ul>	<ul style="list-style-type: none"> <li>provided data for targets set for the library website seven (21%)</li> <li>provided the library with actionable data two (6%)</li> <li>the remainder were one or zero</li> </ul>
<i>Strongly disagreed</i>	<ul style="list-style-type: none"> <li>provided data for targets set for the website two (6%)</li> <li>the remainder were one or zero</li> </ul>	<ul style="list-style-type: none"> <li>all options attracted no responses</li> </ul>

Table 5-5: Mapping the benefits of server log files and web analytics

For the categories '*agree*' and '*strongly agree*' the top three statements selected were the same for both solutions. The themes of those statements selected indicated that broad and general benefits to the use of both methods were experienced. Librarians gained an understanding of website use, data were used for general guidance and data were used alongside other usage information.

In the category '*neither agree nor disagree*' respondents' views differed in only one area, for log file users this was whether these data complemented other forms of data analysis, for web analytic users this was whether actionable data were provided.

When considering the categories '*disagree*' and '*strongly disagree*' it was evident that these options attracted lower response rates, and in some cases were not selected at all. Themes related to more specific and targeted uses of these two methods indicating that these types of benefits have yet to be realised in some libraries.

Questionnaire respondents were provided with an opportunity to indicate whether there were any other benefits to web server log files or web analytics. Seven free text comments were provided in the web server log file section. Comments reflected both positive (five) and negative (four) experiences in the use of log file data, that they were not really used (two) or, that they were moving to Google Analytics (one). The benefits reported included informed on webpage or resource use (two), identified missed content (one), informed the creation of a list of quick links (one) and was marginally easier than student survey (one).

Seven free text comments were appended to the web analytics section. As with server log files both positive (five) and negative (two) views were highlighted. Benefits were that it informed creation of a list of quick links (one), usage of areas of the website were identified (one), informed decisions (one), data were real (one) and statistics did not lie about web traffic (one). Drawbacks were that the data were not complete (one) and the system was installed by the university web team (one). In addition, one individual was unsure and one noted that this was a repeated question.

Opinions on the drawbacks to the use of web server log files or web analytic data were not quite so clear-cut (Table 5-6). Questions were themed around the accuracy of the data, data security, configuring the chosen solution, ensuring all pages were tagged (web analytics only), data overload, using data for decision making, lack of time, lack of skill and lack of funds.

<b>Strength of opinion</b>	<b>Method: Server log files</b>	<b>Method: Web analytics</b>
<i>Strongly agreed</i>	<ul style="list-style-type: none"> <li>• staff did not have time to analyse and interpret the data 10 (30%)</li> <li>• the amount of data generated was overwhelming five (15%)</li> <li>• staff did not have the skills to get the most out of the data four (12%)</li> </ul>	<ul style="list-style-type: none"> <li>• staff did not have time to analyse and interpret the data five (15%)</li> <li>• the amount of data generated was overwhelming four (12%)</li> <li>• the remainder were one or zero</li> </ul>
<i>Agreed</i>	<ul style="list-style-type: none"> <li>• there were issues with knowing how to use the data for decision making 22 (67%)</li> <li>• there were concerns over the accuracy of the data 12 (36%)</li> <li>• insufficient funds to get the most out of the data 12 (36%)</li> </ul>	<ul style="list-style-type: none"> <li>• there were issues with knowing how to use the data for decision making 18 (55%)</li> <li>• staff did not have time to analyse and interpret the data 18 (55%)</li> <li>• there were concerns over the accuracy of the data 12 (36%)</li> </ul>
<i>Neither agreed nor disagreed</i>	<ul style="list-style-type: none"> <li>• there were concerns over the security of the data 17 (52%)</li> <li>• there were problems with configuring the data 13 (39%)</li> <li>• insufficient funds to get the most out of the data 11 (33%)</li> </ul>	<ul style="list-style-type: none"> <li>• insufficient funds to get the most out of the data 12 (36%)</li> <li>• there were concerns over the security of the data nine (27%)</li> <li>• there were concerns over the accuracy of the data eight (24%)</li> </ul>
<i>Disagreed</i>	<ul style="list-style-type: none"> <li>• there were concerns over the security of the data 13 (39%)</li> <li>• there were concerns over the accuracy of the data 10 (30%)</li> <li>• there were problems with configuring the data 10 (30%)</li> </ul>	<ul style="list-style-type: none"> <li>• there were concerns over the accuracy of the data 17 (52%)</li> <li>• there were problems with configuring web analytic tools nine (27%)</li> <li>• the amount of data generated was overwhelming eight (24%)</li> </ul>
<i>Strongly disagreed</i>	<ul style="list-style-type: none"> <li>• staff did not have the skills to get the most out of the data four (12%)</li> <li>• there were concerns over the security of the data two (6%)</li> <li>• there were problems with configuring the data two (6%)</li> </ul>	<ul style="list-style-type: none"> <li>• staff did not have the skills to get the most out of web analytic tools three (9%)</li> <li>• there were problems with configuring web analytic tools two (6%)</li> <li>• the remainder were one or zero</li> </ul>

Table 5-6: Mapping the drawbacks to server log files and web analytics

Note: responses to the question specific to web analytics page tagging were not included in this analysis to ensure that data are directly comparable.

There were some similarities in the categories ‘*agree*’ and ‘*strongly agree*’ as two options per category per method were identical. The identification of funds for web server log files and time for web analytics were divergent themes in the ‘*agree*’ category. General themes revolved around library factors (time, skill, funds and decision making) and data overload.

In the category ‘*neither agree nor disagree*’ respondents’ views differed in only one respect, for web server log file users this was whether there were problems configuring the data, for web analytic users this was whether data were accurate. Data themes were predominantly selected.

When considering the categories ‘*disagree*’ and ‘*strongly disagree*’ it was noted that a greater number of respondents disagreed with the statements put to them. Themes relating to data predominated again, with accuracy, security, configuration and overload selected as not being issues of concern.

Other drawbacks in the use of server log files were identified by four respondents. These included technical (three) and data issues (two), and one respondent was unsure whether web server log file data were used and what could be interpreted from these data. Six comments were made about web analytics. Failings in these data relating to qualitative information about website visitors and the way they behaved were noted (two), use was basic (one) and they provided management with information (one). Two respondents commented that this was a repeated question, one referred to their answer for web server log file statistics, and one was unsure.

### *5.2.7 Factors influencing adoption of new technologies*

It might be concluded that as web analytics was a more recent activity in UK university libraries, web managers had yet to become fully acquainted with these offerings. Therefore, embedding the necessary practices for implementing change suggested by these data had not been fully realised. However, the same might not be the case for web server log file analysis where web managers had more than two years’ experience in their



use. Other reasons to explain why web managers might not have been using web metric data to inform change to their website identified in this survey included: staff time, staff skills, funds and knowing how to use the data effectively. Respondents identified that these data were actionable (server log file 20 [61%] and web analytics 21 [64%]), but it appeared that this was not always fully translated into website change.

In their study of an airline company Phippen, Sheppard & Furnell (2004, pp.289-291) surveyed key staff to gather views on their company's web analytics initiative. They found that 80% of respondents regarded web analytics as '*imperative*' in measuring success and evaluating their online initiatives. Data tended to be used for specific purposes, either in reporting on a successful initiative (60%), or in planning future strategy (30%). The remaining 10% studied these data out of general interest. No indication of the number of staff surveyed or the response rate was given, but the combination of targeted user-friendly reports and the ways in which these data were used to strengthen campaign reporting and strategic planning seemed to work well for this company. Although libraries operated under a different set of circumstances there may be some useful lessons to be learned from this company's approach.

Implementing the chosen solution in a library was reported to be easier where web analytics was concerned (22 - 67%) compared with 16 (48%) finding web server log files easy. A greater number had no view on the ease of implementation of web server log files (12 - 36%) compared to seven (21%) for web analytics. This might have been because a server log file solution had to be implemented on a web server which was controlled by another department, or that the respondent was not responsible for this aspect of their website. On the other hand, web analytics code could be added directly to the webpage code.

Configuring web server log file data or web analytics software was not reported to be an issue. In addition, only six respondents (18%) '*agreed/strongly agreed*' that ensuring all pages were correctly tagged was problematic. On balance a web analytics solution proved easier for web managers to implement and configure. This might be due to the fact that the process of implementing such a solution was more accessible to web managers as the

process is largely activated by tagging webpages in the website with appropriate analytics code.

Some concerns were expressed over the accuracy of both web server log file and web analytic data (Table 5-7).

Category	Method	
	Frequency (Percent)	
	Log file	Web analytics
Strongly agree, Agree	13 (40)	13 (40)
Disagree, Strongly disagree	11 (33)	7 (21)

*Table 5-7: There were concerns over the accuracy of log file or web analytic data*

Issues with the reliability of web server log file data were well documented in the literature. Web analytics was reported to be a more accurate method of gathering data on website use as page tagging is utilised. However, in a recent survey 80% of web analytic end-users in companies worldwide reported that problems had occurred with the overall accuracy of their data (Peterson & Bayriamova 2007, p.17). As this was a relatively new method of website inspection it might account for some of the doubts expressed over its accuracy in recording website activity.

Only one respondent indicated that they had concerns over the security of their library's web analytic data. Apart from this, data security was not an issue for respondents' libraries.

### *5.2.8 Librarians' ability to implement change*

When considering library staffs' abilities to make changes to their website, the influence a centrally provided website template had in respect of design and development was discussed. The questionnaire also enquired about the level of control web managers had over a range of elements of their website (Figure 5-12).

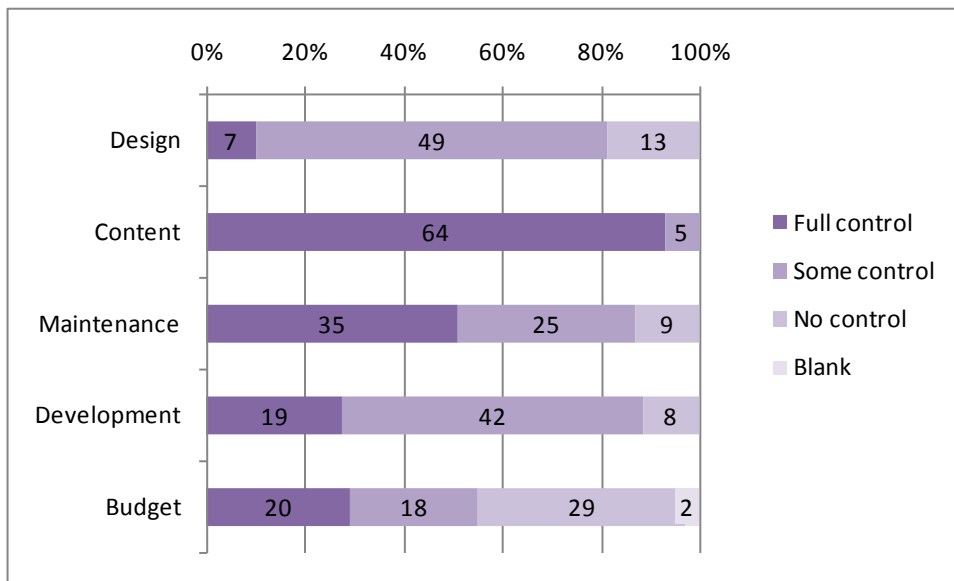


Figure 5-12: Control over the library website

Most web managers had full control over their website content (64 - 93%); just over half had full control over website maintenance (35 - 51%), and most had some control over design (49 - 71%) or development (42 - 61%). The area where least control was reported was that of website budget, with 29 (43%) having no control in this area. This figure could also be an indication to the lack of a dedicated website budget in some libraries. It was somewhat surprising that, despite the figure for those reporting that use of the university's website template was mandatory (62%), 49 (70%) indicated that they had some control over the design of their website. This might be attributed to several factors:

- representation on a university web group;
- through feedback to a website design team; or
- micro-design; the layout of elements on a webpage rather than the elements comprising the banner, footer and university navigation.

### 5.2.9 Reasons for not undertaking user studies

Not all respondent's libraries conducted user studies (14 - 20%), made use of server log file (27 - 39%) or web analytic data (28 - 41%).

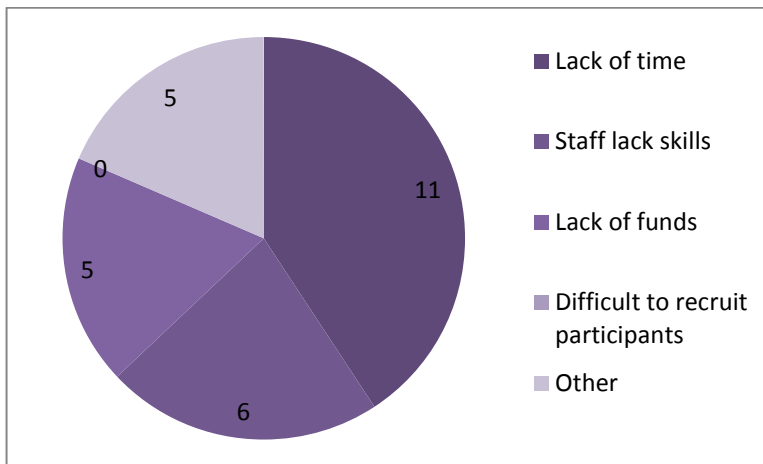


Figure 5-13: Reasons for not monitoring website use

Figure 5-13 illustrates the main determinants for not undertaking user studies as being lack of time 11 (79%), that staff did not have the necessary skills (six - 43%), or a general lack of finance (five - 36%). Although other studies reported that conducting user studies was hampered by the lack of willing study participants, this did not appear to be the case with this sub-set of respondents as none cited this as being pertinent. From the seven free text comments, survey overload (one) and the general nature of the information provided in surveys (one) were mentioned. Other factors were: lack of time (one), ability to change the website (one) and the fact that other library resources were being focused upon (one). Restrictions around gathering and using statistical data (seven) were also noted.

When asked whether they were using web server log file data to assess the use of their website, 27 (39%) stated that they did not. There were three main factors influencing decisions not to monitor web server log files. These were: having no access/limited access to the web server 17 (63%), lack of time 11 (41%) or staff lacked the technical skills 11 (41%). Lack of finance did not seem to be such an issue for respondents not analysing web server log files three (11%). A total of eight free text comments were made and respondents highlighted a number of technical and data issues (five), the use of alternative solutions (three), time constraints (two) or that data were consulted when required (one).

When asked whether they used a web analytics tool to assess use of their website, 28 (41%) stated that they did not. The reasons given were: having no access/limited access to the web server 17 (61%), lack of time 15 (54%) or staff lacked the technical skills 15 (54%). Lack of finance was an issue for some libraries not opting to implement web analytics eight (29%). Three free text comments were provided to this question. One respondent noted that they were not convinced of the benefits, one had no root access to the web server, and one was busy with transferring to a new CMS.

#### 5.2.10 *Feedback*

The final section of the questionnaire provided a forum for respondents to elaborate on their answers, or to add any additional information that they wished to about their library's website monitoring and maintenance activities. The majority of the 26 responses were in line with the themes explored in the questionnaire. There was a focus on the positive uses for data (12), as well as issues in data use (eight). Positive comments focused on analysis of webpages or sub-sets of webpages, use related to a specific project, reports and data consistency. Issues with the data included its scope, reliability, limitations in staffing or that webpages were not monitored. Several areas of exploration were identified (13) including the potential for use and the benefits in the process. Another theme was that of the limitations faced in conducting user studies or analysing metric data (seven). Web managers realised they could do more but were hampered by lack of time, pressure of workloads or their job roles. The university was also highlighted (seven) with some issues around website design, the CMS or whether webpages were monitored. The importance of fostering a good working relationship with the university web team was identified, and that the university could provide guidance on good practice for faculty and support departments. One respondent noted that evidence based practice was important in libraries, but that they were not doing as much with web analytic data as the private sector.

### 5.3 Interview results

The first three interview questions gathered detailed information about the purposes of university and library websites, and any linkages between the two. These questions provided context for librarians' management practices and development activities as well as illustrating key drivers for the differences in approaches to website delivery.

Interview question 1. What roles does your university website fulfil for the university?

Interviewees commented on the fact that their university's website was primarily a marketing tool. Attracting and recruiting students was key, therefore, the intended audience was a mix of prospective students, their parents, current students and researchers. Fewer comments related to the provision of information and services to existing staff and students. Several comments related to the relationship between the university website and that of departmental websites. The presence of a link to the library from the university homepage was believed to be important. Other comments were on a technical theme, mainly relating to the university content management system (CMS). The design of the website and the fact that a rebranding exercise was underway or recently completed were also mentioned.

The following statement encapsulated the collective view of the purpose of the university website:

*The university website, obviously, is a shop window for the university. It is both a shop window from a marketing point of view, and it is also increasingly a gateway into various services within the university.*

Views on the purpose of the university website are represented in Figure 5-14.

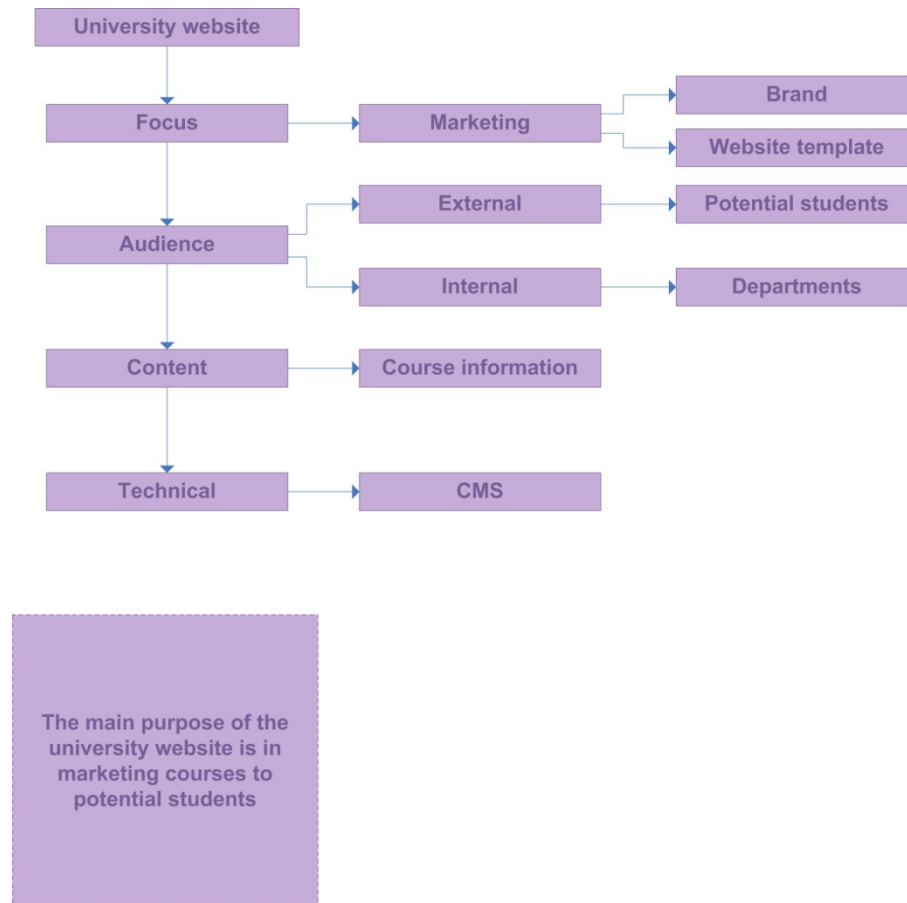


Figure 5-14: Purpose of the university website

Interview question 2. What role does the library website fulfil for the library?

The primary purpose of the library website was reported to be in providing information, resources and access to services. The audience was considered to be current students and staff (Figure 5-15). Thus, the function of the website and its audience were identified as:

*Giving the staff and students the information they need to be able to make full use of the services, making them aware of what's available.*

Other mechanisms for the delivery of information and resources to these groups were also available, mainly through the university's VLE or portal. Technical issues were focused around the university CMS, use of new technologies and improving the search tools available to users.

From their responses a number of crucial differences between the university and library websites were identified. University websites were more closely associated with a marketing agenda, whereas library websites were designed to provide information and access to resources and services. Audiences differed because one set out to attract new students, the other to provide for current students and university staff.

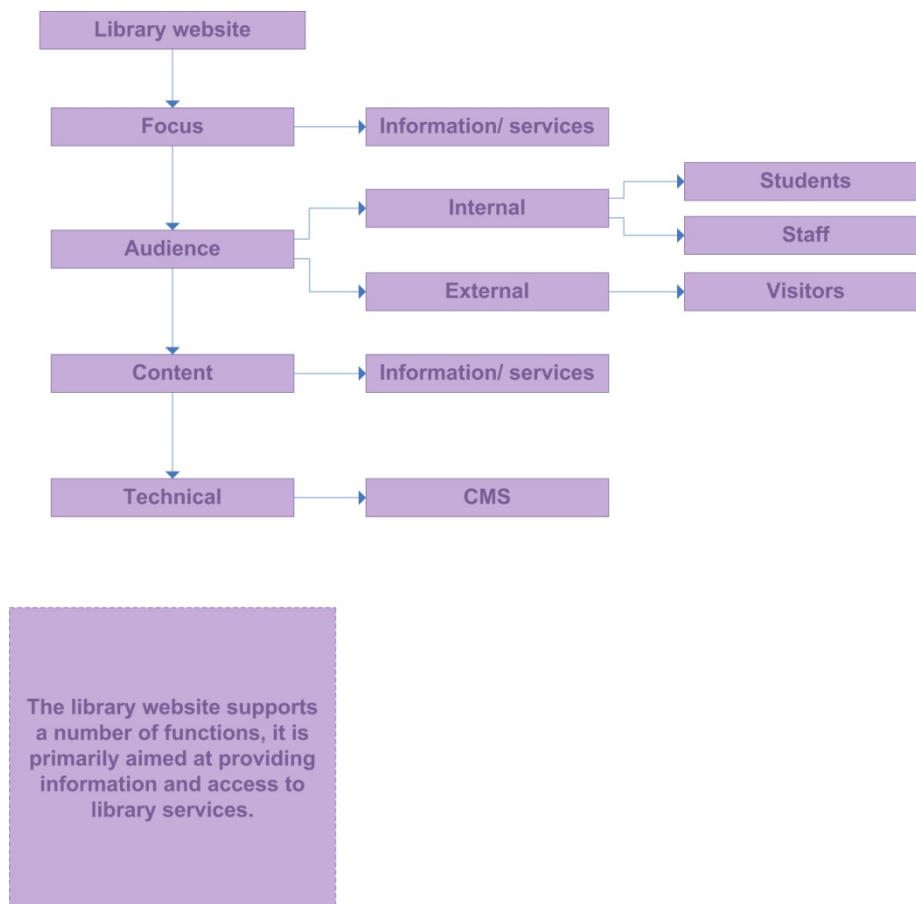


Figure 5-15: Purpose of the library website



Interview question 3. What is the connection between the university and library website?

This question provided an indicator to the ways in which university and library websites related to each other (Figure 5-16). The level of influence exerted by the university over the library website was revealed. The degree to which the library was able to retain its autonomy in terms of website management and development were also elaborated upon. There were a number of themes emerging from the interviews. Some interviewees commented that there was not much of a connection between the two websites. The availability of a direct link to the library website from the university homepage featured in several discussions. The influence of the university CMS was evident, both at a technical level and from a branding and stylistic perspective. The fact that websites across the university looked more professional under a CMS was also noted.

Varying degrees of influence were revealed as some librarians had no control over the design of their website as it was rendered through a website style sheet. Elsewhere librarians were free to make their own choices. Where available, university policy was adhered to by library web managers. University initiatives could impact on the library website and the university web team were sometimes thought to be too busy to respond to library staff concerns. One interviewee noted that there was some dialogue with other departments, but this varied.

Web management was sometimes informal resulting in information across the corporate website being out of step with library practices.

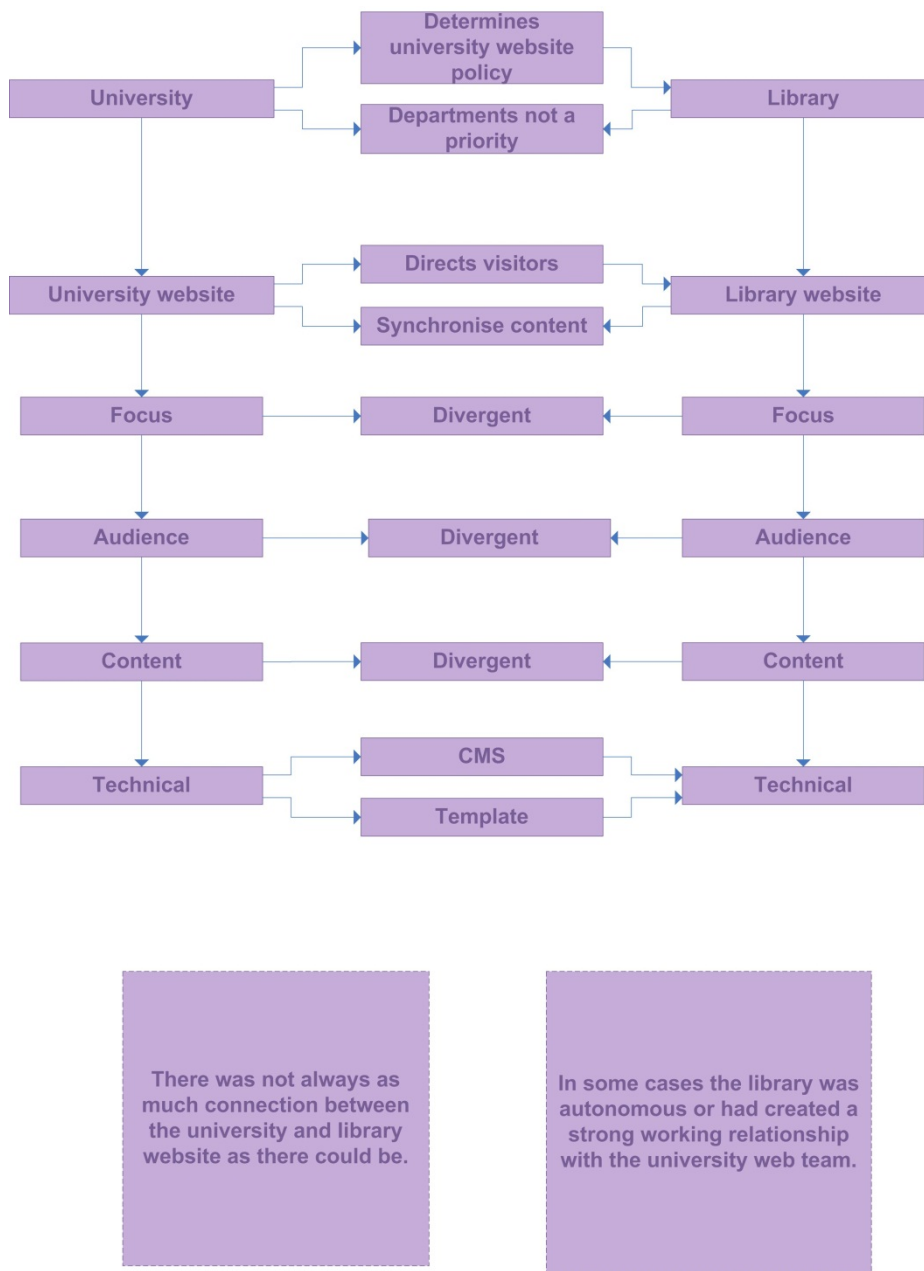


Figure 5-16: University and library website connections mapping

Interview question 4. Can you tell me how your library website is managed?

The presence of a library group to provide a steer for the website was not uncommon. In some instances this group was a formal set-up able to ratify decisions and make policy. Other cases involved an informal group of colleagues making decisions about their website. Conversely, the day-to-day management of the website tended to be handled by

an individual. Elsewhere there appeared to be no formal strategy for the website, although this was considered to be something which should be devised. Finding the time to develop strategy was reported to be a barrier.

One of the key factors mentioned in relation to website management was staffing. Many interviewees reported that their role in relation to the website represented a small part of their allocated duties. The interaction between library managers and web specialists was thought to be an area of interest. The importance of having the correct people involved in the maintenance of the website was also mentioned. Defining roles and allocating staff appropriately was touched upon. Working on the library website was considered to provide staff development opportunities, but training and staff turnover created difficulties. Webpage editors tended to lose the skills acquired in training if sporadic editing of pages occurred and re-training was then required. University training provision was not always timely and sometimes unavailable.

Discussions on content production and editing revealed a selection of scenarios ranging from the case of it being too devolved, to wanting to bring more staff into these areas. Faculty teams and subject librarians played a key role in content creation, although they were sometimes called upon to edit content outside of their specialism.

On the whole, good relations with university groups were reported. Although marketing departments had a different focus some provided good support to their library colleagues. Similarly, the university webmaster or web group were supportive to library staff. In one case an interviewee provided support for all website authors on campus, worked with developers and was involved with website testing. Figure 5-17 represents the library website management factors discussed.

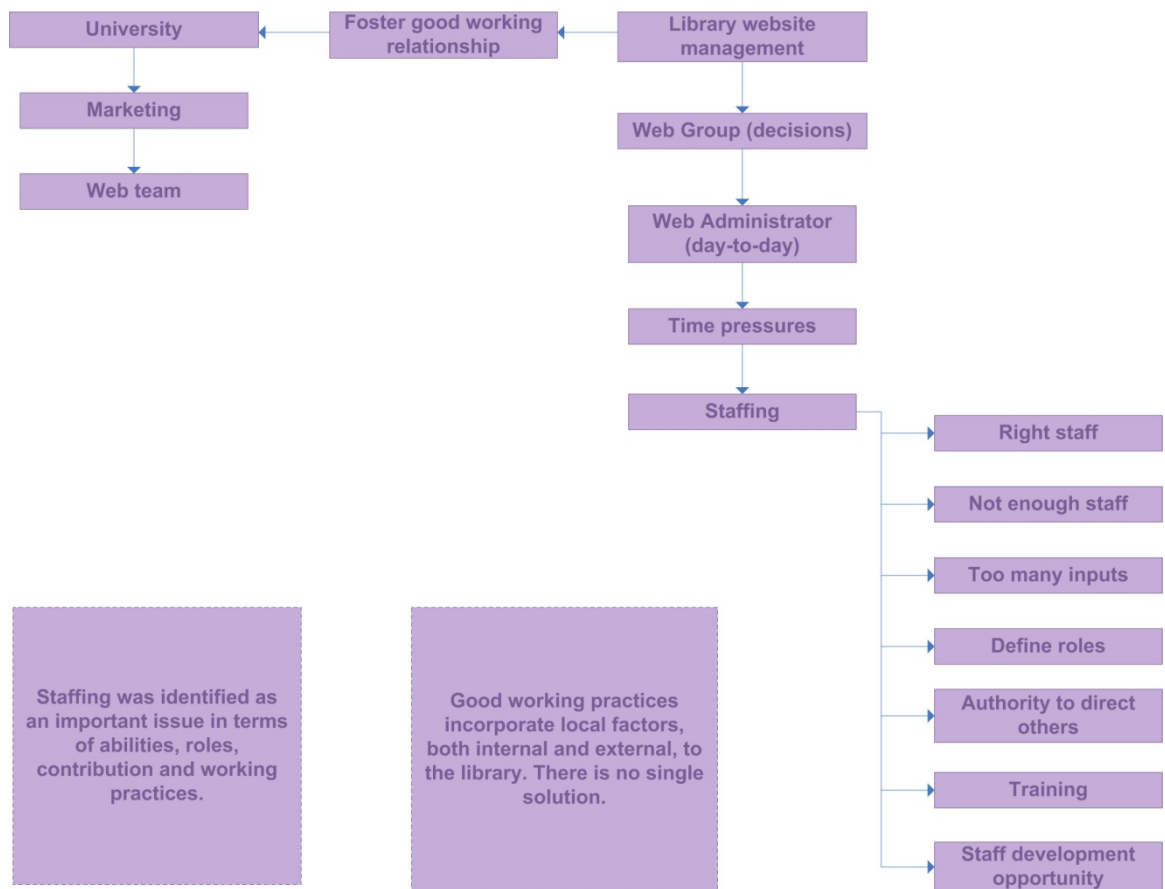


Figure 5-17: Library website management

Interview question 5. Can you describe how you evaluate the effectiveness of your library website?

Consultation with website users took a number of forms including: student survey, feedback forms, suggestion schemes, focus groups, discussions with colleagues, through committee, statistics and usability studies. Some interviewees reported that they were aware of problem areas on the website and that there were things that they would like to be able to do or to improve upon.

Where restrictions on monitoring activities were mentioned, these related to: lack of resource, no defined role or individual to take this work on, pressure of time or technical difficulties. In some cases the website was reviewed when library staff became aware of an issue, such as too much information being present on the homepage, if the university

were to introduce a new template, or if a technical development allowed for additional functionality to be included on the website.

Website statistics were sometimes gathered but not used that regularly, or were available should there be a need to call on them. Other examples of use cited were for following usage trends, for a specific set of pages or a project.

It was not uncommon for user studies and statistical evidence to be consulted post website redesign to assess views on, and use, of the newly introduced website. In this case evidence was consulted as a reaction to a change rather than as an on-going process of evaluation. The constraints highlighted earlier might be influential in this situation. Adopting a new technique and developing the competencies and strategies for effective website use also took time and practice. A map of the factors discussed is presented in Figure 5-18.

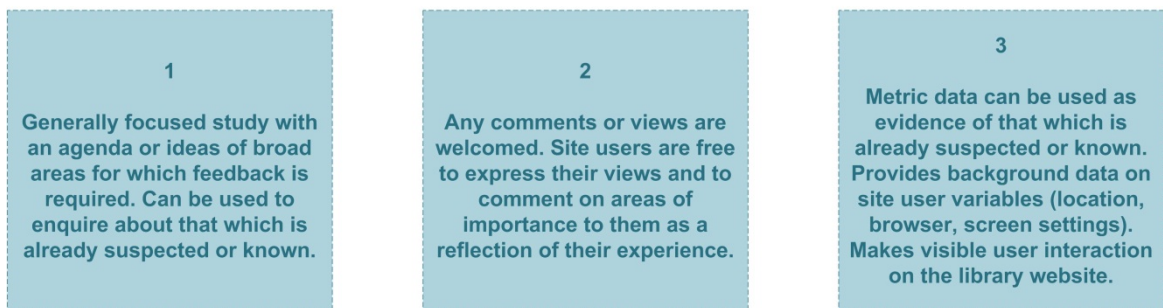
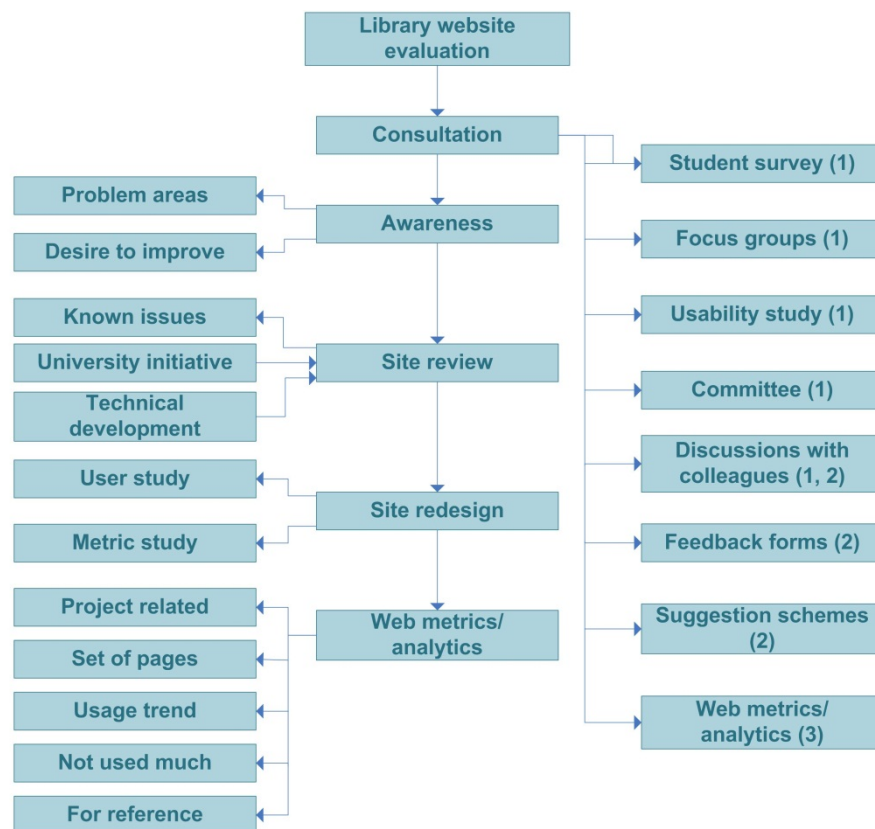


Figure 5-18: Library website evaluation

Interview question 6. How do you see the library website developing in the future?

Future developments were not thought to be easy to judge and although it was believed that there was room for improvement, it was noted that development took time. However, a number of projects impacting on the library website were underway or due to be started. These revolved around extending service provision or introducing more web technologies, multimedia elements and social networking. Adopting a more user focused

approach was one driver for change. Changes to the website would include a review of content to streamline the website, reducing jargon and restructuring.

The role of the university came through in themes around developments relating to the CMS, portal, website was in development and a rebranding exercise was in progress. The VLE was mentioned, but this was in relation to the introduction of a library tab and re-purposing content from the library website into the VLE. This content had been written with this dual purpose in mind. See Figure 5-19 for an overview of influences on future development of library websites.

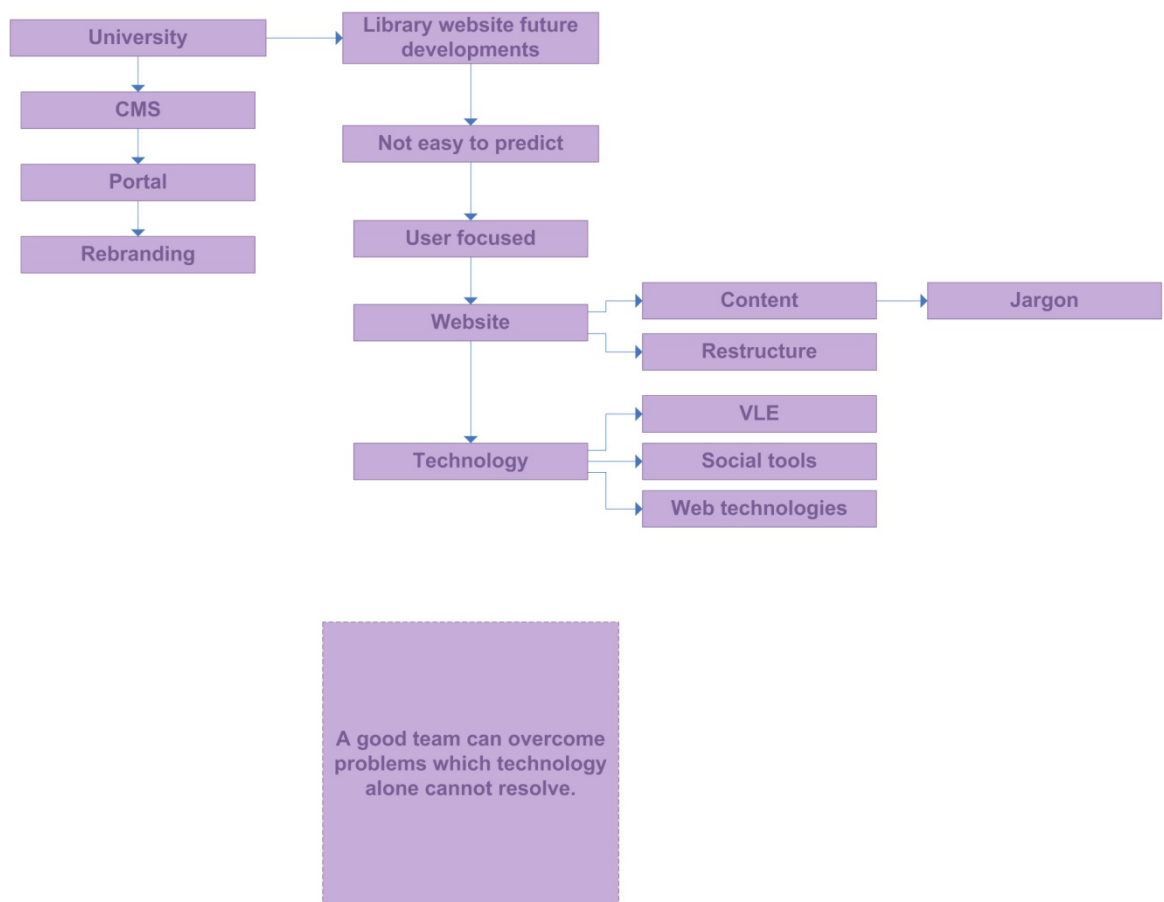


Figure 5-19: Future developments

Interview question 7. Do you have any other comments you would like to make at this time?

Practitioners were concerned that the library website was an area of expanding work and staffing did not always seem to take this into account. There were genuine expressions of frustration at not being able to dedicate the time required to work on the library website. This was sometimes compounded by the fact that staff felt that the only feedback they received was when complaints were made by users.

Technology aspects were not always as important as effective team working. Where possible, small project teams were the preferred way of getting things done; larger teams sometimes hampered developments while consensus was reached.

Some universities fostered a watch-and-wait approach to the adoption of new initiatives and technologies. In this example, internal testing with staff was undertaken before releasing to students or developments at other institutions were followed before deciding to adopt. Figure 5-20 represents an overview of additional comments from interviews.

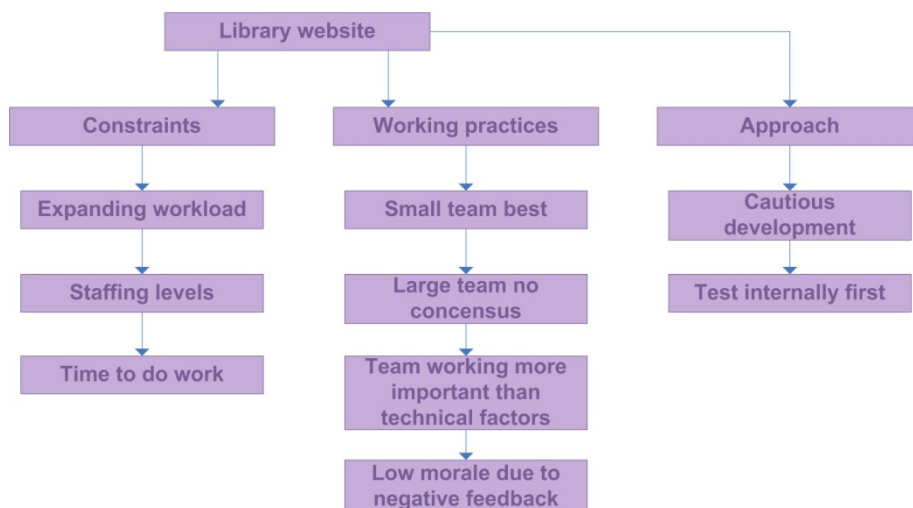


Figure 5-20: Additional website comments



#### 5.4 *Survey findings*

The survey was successful in providing data to enhance understanding of website management and development at UK university libraries. It is known that twenty-nine (42%) libraries had a website policy, while 25 (36%) had formulated a website strategy and 62% (43) of respondents' universities had a website policy. Library websites were managed under a group structure 24 (35%), by an individual 17 (25%) or within a converged service 13 (18%). Other mechanisms included a mix of responsibilities allocated to individuals and/or groups. The most likely staff group to serve on a library web group/committee was qualified librarians (20 - 83%); senior managers were also heavily represented 14 (58%). Other professionals 12 (50%) and information technology staff 10 (42%) made a major contribution. Non-professional staff were much less likely to be represented seven (29%) on a library web group/committee. The skill set of staff contributing to the maintenance and production of the library website included librarians 62 (90%), those who regarded themselves to be self-taught 48 (70%) and computer scientists 26 (38%).

Sixty-two (90%) respondents indicated that their university provided departments with a website template. Where provided, its use was compulsory at 43 (69%) which represented 62% of all questionnaire respondents. In addition, corporate template use was encouraged at 17 (27%) respondents' institutions. Combining these two figures and deriving a percentage of the total number of questionnaire respondents' results in a figure of 87%. Thus, the majority of respondents reported that the preferred option for website design was the use of a university standard template.

Many respondents' libraries 52 (75%) were monitoring the use of their website. A variety of methods were adopted to undertake usage studies including: survey 34 (65%), focus groups 27 (52%), anecdotal evidence 26 (50%) and task setting 20 (38%). Statistical evidence was gathered via web server log files at 33 (48%) libraries, web analytic tools were used also used by 33 (48%) libraries. Other methods reported were feedback forms (three), meetings or discussions (three) and one respondent reported that a usability study had been conducted.

Where monitoring occurred, the majority of respondents' libraries 46 (88%) took the information gathered forward into website development. Feedback informed a range of website changes including: adjustment to the text on a webpage 38 (83%), navigation 34 (74%), labels/terms 25 (54%) or website structure 25 (54%). Web metric data were also used to inform change to library websites as follows: web server log files 15 (45%) and web analytics 12 (36%).

Of the 14 (20%) respondents reporting that their library did not undertake usage studies, predominant reasons were lack of time 11 (79%), staff lacked the required skills six (43%) or lack of funds 5 (36%). Where respondents indicated that web server log files were not monitored in their library 27 (39%) the reasons for this included: lack of time 11 (41%), 'no/limited' access to the web server 17 (3%) or staff lacked the technical skills 10 (37%). Additional comments indicated a degree of mistrust in these data and that web analytics were used instead. Where web analytics had not been adopted 28 (41%) reasons included: lack of time 15 (54%), staff lacked the technical skills 15 (54%) or there was 'no/limited' access to the web server 19 (68%). One respondent noted that they were not convinced that there were any benefits to using web analytics.

### *5.5 Gaps in the survey data*

Data gathered did not facilitate the comparison of changes made to a website as a result of:

- user studies;
- web server log file analysis; and
- web analytics

This was as a result of only enquiring about specific examples of website change made in response to user studies conducted by the library. In respect of web metric data, the questionnaire only asked whether or not changes were in response to these data.

Details of staffing levels in relation to the library website were not gathered. As a result it is not possible to specify minimum staffing levels required to manage a library website effectively from these data.

Data regarding whether libraries used web server log file data or web analytics to track access to files (PDF, multimedia) hosted on web servers, or to outbound links to files or resources (library catalogue, databases, e-journals, VLE, Facebook, etc.) were not gathered. This information could be obtained by carrying out an analysis of library websites by inspecting the source code of webpages containing such files.

### *5.6 Conclusions*

This survey provided a much needed overview of UK university library website management and development practices within a university context. This overview was punctuated with examples from individual web managers' experiences of their library's case. The survey received a good response rate with many respondents providing additional information in the questionnaire's free text comments boxes.

Strategic management through website aims, objectives and Key Performance Indicators was not revealed to be a major factor in the management and development of library websites. However, evidence of other forms of strategic management was observed in respect of internal decision making (policies and procedures), management under a group structure and website policies at the institutional level.

Web managers were keen to maintain physical, brand and technology links between their website and that of their university. However, these relationships were sometimes detrimental to the library where the unique demands of a library website were not fully understood at the institutional level.

There was a tendency for no one person to be designated responsibility for the library website. Accountability was generally shared across a number of staff as a reflection of the different functions associated with maintaining a website:

- technical management/development;
- editorial control; and
- evaluation of website use.

Areas of website responsibility tended to be organised around a single web group or a number of groups reporting to a web group. Staff training was an issue, and as Rogers & Preston (2009, p.208) stated: “An important way forward that web developers, senior managers and information professionals should consider is usability training for staff”.

It was clear that library personnel aspired to improve their websites for visitors. This desire to achieve an effective website presence extended to management and maintenance practices. To a large extent these factors were pivotal in determining the success of the end product of staff efforts.

The tools and methods available for gaining an understanding of visitor activity on a website provided sophisticated options for library personnel in evaluating the use and effectiveness of their websites. This survey showed that many library staff made use of a number of website inspection methods, including web analytics. Statistical evidence, such as that provided by web analytic software, was mainly used to explore general usage trends. It was evident that there were a number of limitations on the extent to which library personnel were able to engage in user studies and to explore the full functionality and capacity of web analytics. These constraints are listed in Table 5-8.

<b>Factor</b>	<b>Constraints</b>
University policy and practice	<ul style="list-style-type: none"> <li>• Marketing decisions may be implemented through a university department or group. University branding must often be adhered to and may be implemented through a website template or a content management system, which also determined website structure. Templates or branding can restrict the presentation of information or reduce the layout options for departments in the way that they would like to be able to present their webpages</li> <li>• Technology (e.g., CMS) – website structure may not be flexible enough to meet the needs of departments, restrictions in the use of externally provided or hosted resources were noted</li> <li>• Usability issues</li> <li>• Training provision – central provision of training may not be timely for the needs of departments</li> </ul>
Website management	<ul style="list-style-type: none"> <li>• Practice of devolved responsibility in relation to the website – page owners and content providers updated their own pages, and potentially published to the web</li> <li>• Web manager may not be the line manager for content providers and therefore did not have the authority to ensure that webpages were updated when necessary</li> </ul>
Staffing	<ul style="list-style-type: none"> <li>• Number of staff involved in the delivery of the website – may be too few or too many</li> <li>• Responsibility in relation to the website</li> <li>• Roles, skills and duties</li> <li>• Time required for undertaking usage studies</li> <li>• Training issues</li> </ul>
Technical considerations	<ul style="list-style-type: none"> <li>• Access to the web server</li> <li>• Constraints inherent in content management systems</li> </ul>
Website development	<ul style="list-style-type: none"> <li>• Website structure</li> <li>• Design and technical initiatives may be constrained by the above</li> </ul>

*Table 5-8: Constraints upon the effective use of web analytics tools*

The freedoms experienced around the management and maintenance of the library website identified in the survey are listed in Table 5-9.

<b>Factor</b>	<b>Freedoms</b>
Consistent website style	<ul style="list-style-type: none"> <li>• Centrally created and controlled website design provided website visitors with a cohesive website. Branding ensured visitors were aware that they were within the university website when arriving at it through browsing or searching</li> <li>• Navigation aids were consistently located and top level and university links were uniform</li> </ul>
Working relationships	<ul style="list-style-type: none"> <li>• Nurturing good working relationships with departments across the university could pay dividends</li> <li>• Try to have a library representative on the university web group</li> <li>• Work with the university's marketing team or technical support department</li> </ul>

*Table 5-9: Freedoms in relation to library website management*

One of the aims of the survey was to gather data for the comparison of approaches to the use of statistical methods for website evaluation and improvement. The premise was that implementation and treatment of web server log file and web analytic data would vary because of differences in the information they provided. Ultimately there appeared to be more similarities in the use of these methods than differences. Several factors may explain this phenomenon:

- the constraints experienced in implementing and examining website usage through these methods to some extent determined their use. Factors such as access to the university web server, staff time and staff skill were seen to be influential in this respect; and
- as web analytics was a recently implemented method of website inspection, this may be a key determinant in approaches to its use. When this method was more established, analysis and understanding these data and how they may be used to implement change will be more fully realised.

Monitoring website activity through server log file and web analytics was viewed as being complementary to other forms of user studies. No one solution was viewed as the optimal method for gathering feedback on the use of a library website. The strengths and weaknesses in the range of inspection methods were understood. Consultation with website users was a vital aspect in understanding website use and in developing the website in-line with user needs.

The amount of web metric data was of concern to some web managers. Their ability to analyse these data were limited by staff time and skill. Web managers struggled to come to terms with understanding the data they were collecting and with how to put it to good use in making decisions about their websites. A greater understanding of web analytics may be required before informed choices regarding website development could be made. A number of strategies were available for dealing with data issues, one of these involved targeting data for analysis. This was aided by the process of defining key performance

indicators for the website, analysing data relevant to a specific project planned or being undertaken or identifying and analysing key pages in the website.

Where web managers reported that their library did not have full control over their website development, issues may arise in directing the website in the way they would like. Further, one could argue that the practice of monitoring and evaluating the use of a website was of limited value where library personnel were not able to fully address issues arising from their website investigations. This may be the case for those web managers who reported that their library had no/some control over the development, design or maintenance of their website.

Implementing change to a library website as a direct response to user feedback may be limited where decisions were outside of a library's area of control. This was especially seen to be the case with website design and structure. It was also evident in relation to the selection and implementation of a web management system and staff training in the use of the university's system of choice.

The next chapter presents detailed case studies from three UK university libraries. These in-depth studies provide further opportunities to understand library website management and development within the practicalities of a library's broader activities. Thus a richer picture of website management and development is uncovered which extends the survey analysis by explaining the reasons behind management and development activities as experienced by library staff.

## Chapter 6 Case studies

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### *6.0 Introduction*

These case studies were an extension of the national survey into UK university library website management and development practices. The survey provided a picture of current practice across the sector. It revealed a range of approaches to website management through an individual or team via formal or informal strategy and policy guidance. Website development was informed by user studies, web metrics, or staff experience and expertise. The survey also provided insights into constraints on library operations. These limitations related to staffing levels, time to undertake evaluation and development work, and a shortage of skills available to carry out web metric analysis. There was also evidence of university influence through corporate website systems, policy, guidance and website templates.

These in-depth case studies provided information about the management of library websites, and how web metric/analytic data informed the website development cycle. They afforded an opportunity to view how library personnel evaluated their website within the operational constraints of the local setting. In order to capture a range of experiences across the UK university library sector, case study sites were selected on the basis that collectively they exhibited a range of different practices in relation to website management, maintenance and development. Taking themes from the national survey as a starting point for selection of case study participants provided a transition from survey to case study method. It offered a lead into individual cases, whilst retaining the connection to broader groupings of libraries. Specific topics under investigation in each case study varied, but the main focus of attention was website evaluation activities. Therefore, two libraries conducting user studies and gathering/analysing web metric data, and one reporting in the survey that they were not conducting user studies or metric evaluation were selected.



### *6.0.1 Research objectives*

Objective 2. To record and analyse UK university library website management and development practices, including strategic dimensions.

Case studies revealed specific examples of the ways librarians managed their websites within a broader scope of library activities and staffing. The practicalities of managing an ever changing website to meet the varying demands of its users were explored. Strategic drivers were also examined to discover whether library or website strategy was an important aspect in website delivery or evaluation activities.

Objective 3. To evaluate the advantages and disadvantages of the methods used for establishing UK university library website effectiveness.

As a range of methods were available to librarians to learn about the use of their websites, examples from practitioners provided valuable evidence of advantages and disadvantages to each method. The case studies also presented an opportunity to enquire about the practicalities of implementing a web analytics solution and any benefits or drawbacks experienced.

The following sections report on themes explored at interview including:

- background: scope of the website, user profiles and authentication;
- website management;
- user studies and web metrics; and
- corporate influence.

Documentary evidence from each university website is presented within the latter category. The researcher then summarises their perspective on website management practice within the case studies concluding with key points from the case studies that may be applicable to other libraries across the sector.

## 6.1 Case Study A: findings

### 6.1.1 Background

This section introduces participants in this study and the scope of the website at Library A. Their website audience is described, and strategies for ensuring appropriate access to resources outlined. Changes in website management are discussed and website monitoring activities explored in some detail. University wide factors in library website management and development are considered. Finally, the conclusion section highlights key issues arising from this case study for Library A and, potentially, for other library website managers.

The webpages at Library A were managed by their E Resources Development Manager who had an overview of the pages and strategic input. Technical expertise was contributed by an IT Advisor. A Subject Librarian who managed their own subject pages and was involved in the library's website rejuvenation project also participated in this case study. Approximately 30 people contributed to the website through membership of various groups, or as page owners and content editors. The website consisted of approximately 225 pages distributed across three servers (Table 6-1).

<b>Website</b>	<b>Branding</b>	<b>Audience/access</b>	<b>Number of pages</b>
Library webpages.	University brand applied by library.	Most pages were publicly available except for one directory which required login.	A few dozen php webpages.
University CMS (Silktide) webpages.	University brand through templates.	All webpages were publicly available and were listed below the Library Services page.	Approximately 200 library webpages.
University's student portal.	University's student portal.	Student portal required login. No public access.	Featured a few links to library webpages.

*Table 6-1: Distribution of library webpages: case study A*

The E Resources Development Manager explained that the library webpages were all themed to match the public pages created using Silktide. This ensured that there was no visual distinction between any of their pages. One of the benefits to this approach was

that it reinforced the library brand and reduced the learning curve for users of each set of webpages.

Visitors to the library's webpages arrived through a number of routes. External visitors, including pre-freshers, wanted access to library resources and so visibility of the library webpages was important.

Profiles of website user groups described during discussions focused on geographic location or age/IT experience. The IT Advisor noted that a slightly larger proportion of their website visitors were from off-campus. They were also aware that although their website provided general resources it served the needs of a variety of different users. Two examples at either end of that user scale are presented below, but the library catered for the whole range of users (IT Advisor):

1. young people with a '*Google expectation*' – everything is free and can be accessed when required; and
2. mature users – resistant to the use of IT as they did not like technology.

The library faced a number of challenges in providing information to meet the needs of their diverse users. Regular users of the website might find it patronising if things were over explained, while others appreciated clear and simple information (IT Advisor). As well as ensuring content was appropriate for website visitors, authentication was also an important consideration and was required for a number of reasons (IT Advisor):

- it helped the library to identify users so that seamless access to resources was provided;
- visitor tracking was possible, and was required for the Athens Service;
- personalisation was feasible; and
- there were also commercial and legal constraints on the library which determined who had access to resources (E Resources Development Manager).

Ultimately, users just wanted access to resources and they did not fully realise the extent of the work library staff undertook to make this possible. Library staff worked hard to maintain control over its own server so that it could offer authentication services to users. There was also an expectation that the library should live up to the phrases ‘*one stop shop*’ and ‘*single sign on*’. These were viewed as marketing phrases, which they tried to achieve, but this was not always possible due to factors outside of their control (IT Advisor).

The location of resources determined the means of access and permissions to view digital items. Library and university resources were hosted in different ways (IT Advisor):

- university resources were stored on servers at the university; and
- most library resources were hosted externally by suppliers.

A couple of website aims were identified and these indicated some of the issues that they faced in delivering services to their website visitors (E Resources Development Manager):

1. since 2000, the aim was to provide users with access to a full range of library resources from any access point. Although this was their aim, they were aware that it was not always achievable; and
2. the rejuvenation project’s aim was to pull the library website into the 21st Century and they believed that this had been accomplished.

Website management and development practices contributed to the achievement of these two overarching aims. The following sections describe their approach to website management and development.

### *6.1.2 Website management and maintenance*

Their web presence was managed by their E Resources Development Manager and a library group which included representatives from across library staff. Website

management had evolved over time from website editing being the sole responsibility of their IT Advisor, to a more devolved setup with this workload being distributed to approximately 30 library staff. At the time this was regarded as a more sensible approach to keep their website current as individuals with up-to-date information edited pages. However, this introduced an element of uncertainty for their E Resources Development Manager in ascertaining whether pages had been updated as there was an additional effort in navigating the Silktide CMS to identify when a page was last updated.

Teams or individuals managed webpage editing and publishing activities. New members of staff received instruction about their website responsibilities from colleagues, or from their line manager during induction. Page owners edited their own pages, or website tasks were delegated to others. Subject librarians had approximately three to 12 pages each. The Subject Librarian pointed out that webpages were maintained as an on-going effort through the year. This work included link checking as the university's Silktide CMS did not automatically check for failed links.

As well as changes introduced by the library, university activities influenced library practice. Within an upgrade to the university's Silktide CMS, the Marketing Department introduced a new workflow to webpage editing. Although the CMS's hierarchy forced this change, it led to a number of restrictions on the work that library staff were able to undertake or delegate to colleagues. Webpage editors had to attend university training before they could edit pages. In addition, the library was accommodating the university's more structured way of working whilst retaining their more informal internal practices. At this time they did not have formal policies, but restructuring within the library could alter this approach (E Resources Development Manager).

### *6.1.3 User studies and web metrics*

As previously noted, website aims achieved a level of success. Measuring and providing evidence of this could be achieved by gathering users' views on the website and from evaluating web metric data. These two methods provide qualitative and quantitative information and both played a part in website evaluation activities at library A.

### *6.1.3.1 User studies*

User studies and web analytics were not conducted in a systematic way. However, library staff carried out an annual user survey, which included questions about their website. In addition, the rejuvenation project gathered targeted feedback from users to inform website development. The focus for this work was the public Silktide webpages, and ensuring technical aspects were up-to-date to support this work. Three working groups looked at Navigation, Information Skills and Subject Approach. The project aimed to bring the library website into the 21st Century, which they had achieved. The Silktide webpages now featured more interactive elements created with Captivate, Adobe Presenter and Wimba. A variety of formats were delivered to users so that a range of needs were catered for. However, there were limitations to what could be achieved with technology and time being key determinants.

Individual page owners would decide whether to continue using this feedback for specific issues once the rejuvenation project ended (E Resources Development Manager). Outside of these activities, they did not receive a great deal of feedback about their website.

### *6.1.3.2 Web metrics*

If statistics were requested then Google Analytics (GA) was available but these data were not regularly used to inform website change. One area where these data might influence decisions was on which resources to promote. This was thought to be appropriate where effort was applied to creating a resource and it would be valuable to promote it, at student induction for example. There was seen to be a clear benefit here with something of value to measure. In industry where products are sold an increase in sales might lead to a corresponding increase in staff bonuses. In this case, a measurable change to the website provided evidence of increased sales (IT Advisor). This was not believed to be the same for a library where the aim was to make things better for users. Although surveys provided numbers, qualitative data were much more interesting to library staff. Statistical data were useful where justification for spending was necessary, in e-journal expenditure for example.

Statistical evaluation was a time consuming activity but they considered themselves fortunate because they had a member of staff who spent half her/his time providing statistical data for others to interpret. For example, in the early stages of analysis Subject Librarians were advised what data were available and were asked what information they wanted from the figures. By going through this consultation process they were able to move their data analysis forward. Google Analytics data were also used to assess resource use and these provided guidance to Subject Librarians creating resource listings pages. These data provided evidence of usage which was more likely to be believed than an opinion on that which was known to be true (E Resources Development Manager).

Google Analytics was installed on the university's Silktide pages and the library's authenticated server pages. Library staff did not have account details for their pages on the university's web server (Figure 6-1). Instead, they received a monthly summary report for these pages which listed top content. Additional information was available through Silktide CMS if they entered at the system at the right level (E Resources Development Manager). When library staff asked for information regarding how often their pages were accessed they were directed to the summary report. As the report gave meaningful names to pages, it was easy for page owners to locate their own data.

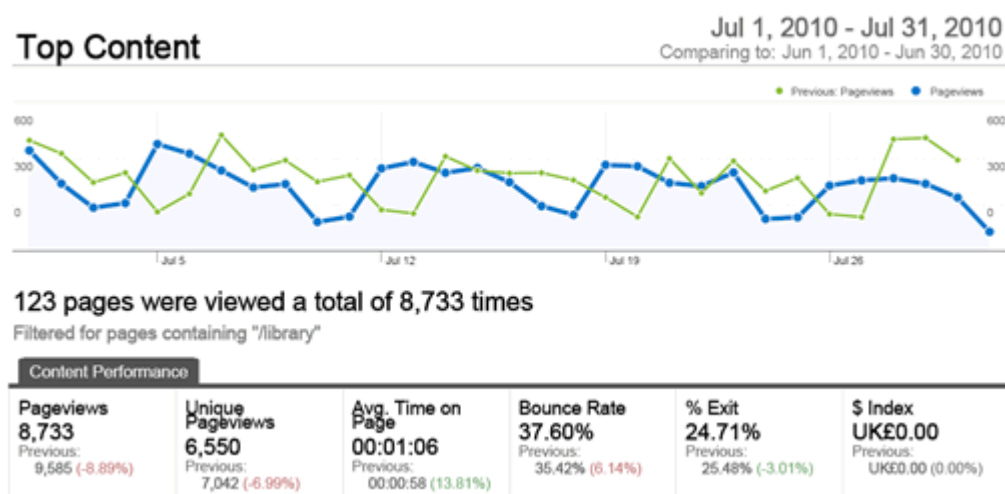


Figure 6-1: GA Top Content: case study A

The Subject Librarian was interested in the number of visits to her/his staff profile page. This was a figure she/he would like to see increase and the interest in page usage prompted the E Resources Development Manager to comment that GA would be relevant to other page owners, and potentially of more use to page owners than it was to the IT Advisor.

Google Analytics for the library webpages were more accessible to Subject Librarians and staff involved in acquisitions and purchases as the library had its own GA account. A general login was available and had been used by the Subject Librarian for looking at information about her/his pages. Although there were relatively few webpages on this server their Captivate tutorial pages were listed here and usage figures for these resources were consulted during the rejuvenation project. Information available was of interest because it identified entry and exit points for particular pages, as well as providing data regarding how people arrived at these webpages (Subject Librarian).

Although GA was of some practical use to Subject Librarians and staff involved in acquisitions and purchases they experienced difficulties in taking this information forward into website change, and there were gaps in these data. Where this information was used to test page changes, it was not easy to determine whether these changes had really made a difference.

Google Analytics did not provide library staff with information about groups of website users or individuals. The IT Advisor's own system offered this level of detail because the library's web server had Athens authentication. If requested, statistics for resources use by department could be provided. Segmentation by staff, researchers and undergraduates was also possible although more difficult to extract.

Several areas of interest surfaced during the interview that might form actions for taking GA evaluations forward:

- advertising: there was recognition that more advertising of their GA information might be helpful to library staff. This might include informing staff of the GA



report for the library webpages, and advertising some of the figures in this report through their internal newsletter aimed at Subject Librarians and Library Managers;

- audience: page owners might find web analytic information for their own pages interesting and they may be able to act on these data;
- marketing intelligence: statistical data could inform decisions on which resources and services to promote more widely; and
- service level agreements, KPIs and metrics: library staff worked towards targets in some areas of service provision. This approach might prove useful in developing their webpages. A 'cost per page metric' could inform decisions on whether page maintenance was worthwhile if that page was not well used. Alternatively, a particular webpage might be essential even if access figures were low.

*That's interesting. This might be a useful thing to take forward into the new group once all the work has been completed this summer, specifically all the Navigation Group work with the videos and everything else. It might be useful to do this, to do counts on that to justify the amount of time and money it might be to update or replace in so many years time. It would be for that group to discuss (E Resources Development Manager).*

There were other examples where statistical data proved useful for guiding decisions, monitoring new services and in setting targets. One service provider gave them useful information on journal accesses, turn aways and online purchases. A member of staff requested information on the use of her/his PDF files and in this case Analog web log analyser provided the necessary data. Another example arose when they advertised a new mobile application service by posting flyers in the library. This resulted in an unexpectedly high level of uptake of the service prompting further investigation to ascertain how to take the application forward. A move to increase the self-service ethos with associate targets for use was also undertaken. This was a metric driven target devised to increase the use of self-service machines to maximise cost effectiveness.

#### *6.1.4 Corporate influence*

The university had some authority over library website practices through mergers and demergers, CMS and corporate image (Marketing). The library had experienced a number of benefits from these initiatives and they will be reviewed in order to improve their service provision.

In an independent review of the webpages of university A, documentation for website managers at the institution were located. The Marketing Department had developed guides for website managers and content providers which set out the corporate brand. There were rules for the use of colours, images, text, fonts and advice on when to use static or Flash banners. Advice was provided regarding writing for a variety of literature, avoiding jargon, maintaining consistency, using an active writing style and writing for the web. Web editors were offered training, tips, best practice, web standards and more. Measuring website traffic with GA was outlined in a basic guide to GA and a workshop with accompanying slides covered some of the available GA information and its interpretation.

##### *6.1.4.1 Advantages to corporate influence*

Using bought in software supported by the university, such as Silktide, brought benefits to the library as it freed up staff time for other tasks and development activities (IT Advisor).

The library had access to virtual servers because of their association with an IT Department. One advantage of being part of a virtual system was that much better support was available if the system failed. Maintaining library servers gave them greater control, but if anything failed, responsibility rested with the library. Another advantage of virtual servers was that they could be upgraded by adding additional memory (IT Advisor).

New media formats like Captivate tutorials and Flash files require large amounts of storage space. The library had access to servers for Flash video streaming through a prior

merger with an IT Department. Providing these rich media resources would not have been possible if the library had to host these files on their own servers.

#### *6.1.4.2 Challenges created by the corporate influence*

The way the library managed and organised its Silktide pages was in transition. The latest version of the CMS software (Silktide) had a more hierarchical structure controlled by permissions within the system. This meant that library staff had to adjust to this new way of working and university training was required before any webpage editing could be undertaken. With the new CMS the Marketing Department also decided page owners' names and page update date would not appear. Their reasoning for this was that it was on the Internet therefore it must be current. This caused library staff a couple of problems:

- the updated date was an indicator to when a page was last reviewed. In the absence of this indicator, controlling website currency was difficult. This information was available through the CMS but getting to it was cumbersome and time consuming; and
- when the university originally introduced Silktide each webpage featured the owner's name. This worked well because feedback went to the right person at the right time. Prior to this, their IT Advisor's name appeared on all webpages and she/he received all website enquiries, which was not very effective. However, there was now uncertainty about who looked after specific pages and who to report page errors to.

The corporate image, defined by the Marketing Department, had to be applied across all library webpages and systems. Download speeds were sometimes affected by the ng which was chose by Marketing. However, the Marketing Department were willing to make changes if appropriate justification was given. Concerns were raised about how the library would cope if decisions at a higher level dictated a change of corporate image every year (E Resources Development Manager).

Apart from these areas of influence, library staff had a fair degree of autonomy over what they did with their website and how they achieved things.

The following sections provide a summary and evaluation of the case based on the researcher's understanding and interpretation of the available data. In addition, the conclusion highlights some key points which may be of interest, or relevance, across the UK university library sector.

#### *6.1.5 Summary and Evaluation*

The combined total of library webpages might be categorised as medium in size, having in the region of 225 pages. There were a reasonable number of content creators and page editors, around 30 in total, providing input to the library website. Statistical evaluation and website development were two areas where increased staffing might benefit the library. The E Resources Development Manager had a strategic overview of the website and along with the rejuvenation project steered development accordingly. Their IT Advisor handled technical development guided by library staff requirements. From an outsider's perspective, this arrangement appeared to work well.

A mix of major change and continuous improvement informed their website development cycle. Library-wide projects were used to introduce major change. Efforts to monitor change to individual pages and to understand how visitors responded through metric data had proved problematic. One of the key questions for library staff was: is there enough justification for spending the time gathering and analysing website usage data for the information that it provided?

*That's the crux of it, justification. If you can prove it's going to be a worthwhile thing in the end, you do it. And, I think in this climate one of the key things is if it's going to save some money, or give us better value for money (E Resources Development Manager).*

A wide range of website metrics were available to them through GA, Analog and systems that their IT Advisor had put in place. A sample of website metrics provided by GA is listed in Table 6-2. This table also provides a mapping of metrics available in Google Analytics and those referred to during the case study interview. Subject Librarians and

those involved in acquisitions and purchasing might have considered other metrics that were not cited as examples during the interview. However, the mapping suggests areas where GA metrics were relevant to library staff, were not appropriate, or had not been investigated.

<b>Metric</b>	<b>Available</b>	<b>Used</b>
Visitors	YES	NO
Visits	YES	YES
Page views/sessions	YES	YES
Time on website	YES	NO
Most popular page	YES	NO
Top entry page	YES	YES
Top exit page	YES	YES
Bounce rate	YES	NO
Most valuable section	YES	NO
Paths through pages	YES	YES
Referrers	YES	YES
Top browsers	YES	NO
Top platforms	YES	NO
Top video resolution	YES	NO
Search engine keywords	YES	NO

*Table 6-2: Metrics available and those used: case study A*

Reasons for not considering more of the available information were that Subject Librarians and those involved in acquisitions and purchasing were not aware of the available data, were not sure how to interpret it or to use it to inform change to their webpages. However, quantitative data provided real evidence of resource use, which informed decisions and provided justification for senior managers. One example of this was that of measuring the use of a new mobile application service. Conversely, qualitative information helped them to understand their website users' actions.

Marketing policy clearly played a part in the way library staff managed and developed their website. Evidence of benefits delivered by central initiatives, such as the CMS and virtual servers, were described. However, constraints were also evident where university wide governance limited decision making in the library. The university's operational structure and responsibility for the corporate website (technical, marketing/design, and Google Analytics) played a part in the way the library website functioned.

Several themes around website management, user feedback, website measurement and corporate influence emerged from the interview (Table 6-3). These highlighted areas where the benefits of web analytics may become more apparent. This included defining key aspects of the website to measure, defining appropriate metrics to monitor and providing guidance in the analysis and interpretation of these data. Linking web metric analysis with new resource use and marketing initiatives offered some quick wins for library staff. Staffing levels and skills for some aspects of website analysis and development may not be sufficient for undertaking web analytic work. In spite of the restrictions on change to certain areas of their website, there were examples where website metrics, along with users' qualitative feedback, informed the library's website development cycle.

<b>Theme</b>	<b>Rationale</b>	<b>Example</b>
Website audience	Online resources had to meet the needs of a mixed ability audience.	Broad spectrum of user abilities was identified.  Resources were available in a range of formats to give users choice.
Website management	Management through a library group was balanced by informal working practices and individual page ownership.	Webpage content and editing responsibilities were devolved to individuals with ownership of a set of pages.  Formal policies had not been created.
Staff time	Putting data together and making sense of it was time consuming.	Data extraction and analysis was expensive and not always feasible.
Technical development	The bulk of technical development work was carried out by their IT Advisor. Improvements to established systems were undertaken where workloads permitted.	“It never gets easier, never gets quicker, always grows in complexity” (IT Advisor).
Understanding website users	Qualitative information increased understanding of users’ actions and experience of the webpages.	User comments were illuminating as they provided insights into the reasons behind users’ actions.
Understanding data	Quantitative data did not tell them why things happen, why users did the things they did (context).	Staff need to have a greater understanding of the available data, how to read and understand it.
Justification for metric analysis	If direct cost benefits for measuring resource use could be argued, then metric analysis was more likely to go ahead.	Journal or Captivate tutorial usage.
Promotional campaigns	Metric data were useful for measuring advertising of new resources.	Mobile applications and Captivate tutorials.
Marketing’s influence through website templates	It was only possible to change the text and images on their Silktide webpages.	Reduced their ability to change their website to correct usability problems.
Introduction of new technology	Adopting new technologies can bring real benefits.	The university introduced a CMS (Silktide) which was a powerful tool the library would not otherwise have access to.

*Table 6-3: Key themes: case study A*

Management of the website at Library A was established through individuals with key roles and by groups set up to oversee projects to improve their website. Feedback from a variety of sources informed development, but these data were not always reliable and did not necessarily provide the information that they wanted. Corporate influences played a

part in the systems available to library staff for delivering their website presence, and in the presentation of their information and resources.

### *6.1.6 Conclusions*

One of the aims of this case study was to extend the national survey findings by exploring practice within Library A. Four broad topic areas were investigated with specific detail and supporting examples being provided by library staff. Conclusions were drawn from the information provided by interviewees at Library A. However, these were interpreted by the researcher from the available data and are, therefore, not necessarily reflective of the broader perspective of participants in this study. It is also worth pointing out that other staff at Library A involved in their web presence might have had an alternative perspective.

#### *6.1.6.1 Background*

Managing, maintaining and developing a library website involved a range of intricate processes and practices. In this case study the importance of understanding website visitor demographics and providing mixed ability users' access to resources featured.

- ***Diversity***: students had a range of skills and abilities and, therefore, different experiences and expectations of the library website.

#### *6.1.6.2 Management*

Management styles vary but an understanding of the local situation and being able to capitalise on the strengths of personnel involved in maintaining and introducing innovations to the website were essential. Adapting to university practices and presenting a case for change to benefit library website users was also an important management skill. Managing the process of website development involved bringing a range of disciplines and techniques together. Website aims guided the change process through a project and in turn this was informed by user feedback or website metrics.



- **Balance:** individual input and ownership of webpages provided a balance to formal decision-making process through a web group.
- **Advertising:** advertising website usage information to the right people so that they were able evaluate it and act on it was important.
- **Staffing:** the time required to undertake technical work and analyse information on website usage might not be cost effective.

#### 6.1.6.3 *User studies and web metrics*

User studies and web metrics played a part in website management and development activities at Library A. User studies were conducted annually with information specific to their webpages being monitored. A recent project to develop their Silktide pages also considered user feedback. Statistical data on resource usage (databases and journals) were used systematically for informing Subject Librarians, acquisitions and purchases. These processes had been refined over the last five years. Google Analytics was a newer tool and had yet to establish its key benefit in their website development cycle. Activities where potential cost savings might ensue were supported by the necessary staff time to harvest and process statistical data. Other examples of web metric use were more exploratory and sufficient representative data for effective interpretation was not always available.

- **Qualitative data:** user studies provided valuable insights into users' views on their website and their activity on it.
- **Evidence based practice:** one of the strengths of statistical data was that it provided evidence of activity.
- **Comprehension:** individuals needed to understand what web metric data revealed about website usage. From this awareness, guidance was required so that webpage owners were able to transform their pages in response to the available information.
- **Justification:** unless justification for analysis was provided, it was unlikely to be undertaken.

#### 6.1.6.4 *Corporate influence*

Library staff benefited from corporate influence in some areas, but there were also challenges. Provision of supported central services had a positive impact on library operations. However, a degree of loss of control over aspects of website provision, maintenance and development activities ensued. The university's CMS, associated template and a marketing agenda were strong drivers for the corporate website. These factors did not necessarily support the library's provision of information and resources to their users.

- ***Restructuring initiatives***: mergers and demergers at the university, and restructuring of roles within the library influenced website roles and responsibilities.
- ***University CMS***: the university's CMS determined workflows, permissions to edit webpages or to delegate work. In this example, university training was required before webpages could be edited.
- ***Corporate brand***: corporate brand introduced limitations on change to the library website. Elements within corporate templates could affect download speeds, and therefore service delivery.
- ***Training***: although Google Analytics training was available, some additional advice on transforming these data into website change might benefit individuals looking to use these data to inform website change.

Despite the inherent difficulties in managing and developing their website, Subject Librarians, acquisitions staff and website visitors realised benefits from these activities. Subject Librarians and acquisitions staff received intelligence about the use of the information and resources they provided. This information then contributed to webpage contents and resource purchasing. Webpage visitors had access to pages with a consistent look-and-feel and a range of innovative new resources. User feedback informed the website development process with statistics on resource use being particularly valuable. Web analytics was not used in a systematic way but it acted as a reference point. Qualitative user feedback provided useful intelligence on why users did things in a certain way, while quantitative data provided evidence of resource use rather than

identifying usability issues. In spite of the limitation of lack of time and ability to change some aspects of their website, library staff were using web metric data in their roles. If evidence of website use was presented as justification for spending (staff time) web analytic data may become more useful to the library.

## 6.2 Case Study B: findings

### 6.2.1 Background

This section introduces participants in this study and the scope of the website at Library B. Their website audience is described, management strategies discussed and website-monitoring activities explored in some detail. Some of the difficulties encountered with getting the required information from Google Analytics (GA) are revealed. University wide factors in library website management and development are considered. Finally, the conclusion section highlights key issues arising from this case study for Library B and, potentially, for other library website managers.

The website at Library B consisted of around 200 pages. This number was greatly reduced through a project they conducted a few years ago. Approximately 25-30 staff were actively involved with webpage editing through ownership of sections of the website. As well as their library website, they have developed a number of other websites designed to deliver specialist content to their users (Table 6-4).

<b>Website</b>	<b>Branding</b>	<b>Audience/access/content</b>	<b>Number of pages</b>
Library website	Library website themed to university brand.	Current students, Academic staff and researchers.	In the region of 200.
Website providing information literacy advice	Standalone product with its own brand.	Open access – current students for developing information literacy skills.	In the region of 100
Website providing information literacy advice in the workplace	Standalone product with its own brand.	Open access – current students for developing information literacy skills for use in the workplace.	In the region of 20

*Table 6-4: Examples of library Web presence: case study B*

The website marketing manager explained that the library followed university brand guidelines and tried to maintain a consistent look-and-feel. However, it was not always possible to implement this across their product range as some of their websites were designed to be standalone products. Their preference was for all their outputs to be easily identified as library products.

There was considerable variety in their website user profiles, which was partly due to the way the university operated. The website strategic manager explained that they had academics that created courses which were then delivered by associate lecturers who might also be lecturers from other universities. Their courses were open to all and formal entry requirements were not always stipulated. In this environment, a single library website had to serve the needs of a wide range of audiences. As students were their largest customer base, their website was designed to meet their needs.

Along with a diverse range of website users, students had different levels of IT ability. The website content manager pointed out that they had evidence from their help desk that some students were new to IT. For example, some library users did not know what 'double click' meant or what the 'browser address bar' was. At the other end of the spectrum, some users were frustrated by the interfaces supplied by third parties. According to the website strategic manager, age was a factor in levels of IT ability as they had observed that their older learners were not always that comfortable with technology. The website marketing manager added that the university had introduced compulsory use of computers which was driven by use of the VLE. Along with diverse user groups and a range of familiarity with IT, course time-scales influenced library support.

There were a couple of issues with website change:

- The library website should remain the same: feedback from students and academics suggested that there was a perception that the website was always changing, when in reality it has remained the same for three years (website strategic manager). Visitors to their website noticed change at the individual link

level, particularly if a heavily used link was altered (website marketing manager); and

- detailed course instruction can restrict website change: the university managed learning for its students with course materials providing fine-grained instruction. This might include an image of the library homepage with instruction to click on the third link down on the right hand side. A move away from this model to one that encouraged independent learners was in progress. However, the website content manager explained that their students were traditionally time poor and so courses were designed to help them save time and ensure they had all the information they needed for their studies.

Library staff were embracing different ways of engaging with users in an attempt to reach out to them through the systems they used. The website marketing manager posed a question on Facebook enquiring whether users found it helpful having a library presence in systems like Facebook. Comments from students indicated that this was appreciated. These initiatives were believed to give students more flexibility in the way they interacted with the library (website marketing manager). Staff at Library B also considered experimental tools such as bookmarklets, widgets and gadgets that students might find useful. These were available on a separate area of the website and they received a regular, but not substantial, stream of use. Support materials were not provided as these would be time consuming to create (website strategic manager). They were also wary of recommending resources to students who might then expect a certain level of support (website marketing manager).

### *6.2.2 Website management and maintenance*

A number of groups governed the library website while the website content manager had responsibility for editorial aspects of the website. A Quality Improvement Group had a remit to monitor editorial matters, quality and standards. Representatives from different teams across the library with a variety of specialist skills were represented on the group. A Marketing Task Group considered different aspects of web development while the Leadership Team had overall ownership of the website. As their website was one of the

primary channels through which people interacted with the library, a two monthly report and presentation around website development was delivered to the Leadership Team (website strategic manager). There was also a User Experience Group which focused on students' experiences of all library services. Relevant issues identified by this group also informed website development. The library had a Web Improvement Plan, which was a rolling document of tasks and activities carried out to make changes and improvements to the website. The process involved items being agreed at the Web Group, taken to the Leadership Team who signed them off if they are happy with them. Their Web Manager moved on recently and they were not looking to reappoint, although some web manager duties had been reallocated.

Webpage editing was devolved to library staff with the exception of a few dynamic pages not in the library's Content Management System (CMS). About a third of library staff (25-30) were involved in webpage editing and individuals took ownership of a set of pages. They used a WYSIWYG editor so that page editors did not have to write HTML. Library staff also edited wikis and were quite competent with technology. There were no formal workflow processes but there was a process in place to remind webpage editors to update their webpages every three months. Staff were also reminded about policies and procedures, and there were editorial guidelines covering terminology and tone of voice (website content manager). Training for webpage editing was not needed, but the library's Information Literacy Team recently delivered a session on writing for the web. Library staff also ran a session on navigating the website for staff who were not involved in day-to-day webpage updating. They also ran other ad-hoc sessions and their wiki featured a section about the website with instructional guidelines which was being extended.

They had some freedom to change their website but the university was moving towards a standard website template (website strategic manager). At the moment, there was no university wide CMS, however, there was a university information architecture which the library website, along with others at the institution, had to fit into. The website strategic manager believed that this architecture did not always suit the library.

They were looking to redevelop their website in the near future. The website strategic manager noted that the last redevelopment was in 2007 which was followed up with minor adjustments to the homepage in 2009. It was their practice to make a major change followed by a number of smaller updates. Their next project was a move to a new technology platform; they currently used ColdFusion. This would be accompanied by a look at user requirements and information architecture to rebuild the website. In terms of content, they were being careful not to return to the position of having hundreds of webpages. The website strategic manager was not aware of any issues over the reduction in the number of webpages. The website marketing manager did not believe that the reduction in webpages was an issue as there was a lot of content duplication previously. On-going discussions about which webpages were relevant was regarded as more important. Developing a new website presented an opportunity to evaluate and compare usage data as the following comment illustrated:

*I think what might be interesting when we change the site in the future, and then a little bit down the line, compare that data with what we've had for the last three years. I think that the picture there will tell us quite a lot more about how people are using it [the website] in a different way (website marketing manager).*

### 6.2.3 User studies and web metrics

Various methods were used to gather feedback about their website, with qualitative and quantitative information contributing to website evaluation activities.

#### 6.2.3.1 User studies

The website marketing manager described some of the activities undertaken to gather views on their website. They conducted a student survey every two years looking at different aspects of library service. There was a feedback form on their website and when a new product or service was launched they encouraged feedback at the time it was rolled out. Ad-hoc surveys with different customer groups (staff on campus, associate lecturers or PhD students) were delivered when required. The Illuminate video conferencing

system was used for these sessions (website strategic manager). There was a standing item on every Web Group meeting to look at user feedback. The website marketing manager maintained a spreadsheet of feedback which was scanned for any comments about their website. Results from the National Student Survey (NSS) might also have an impact on their website. They were particularly interested in trends or issues that needed to be acted on. They planned to use more frequent smaller scale polls and rating systems built into the website to inform evaluation of their new version website (website strategic manager).

They had seen an increase in feedback through social networking and social media systems (Twitter and Facebook). The website marketing manager noted that people might not intend their comments to be actioned or actionable but library staff looked at and responded to such postings. She/he added that users were sometimes surprised when library staff joined in their discussions. However, as the website strategic manager pointed out this only represented a small proportion of their users.

In the past, in-house software for conducting eye-tracking studies for usability testing was carried out and they had access to labs on campus where Adobe Eye Tracker was available. They planned to test the new version of their website and their website content manager was attending a training course on various aspects of usability. The website strategic manager stressed that results need to be looked at carefully so that they could make sense of these data.

One indicator the website strategic manager monitored which arose from the library survey was expressed as the percentage of users satisfied or very satisfied with their website. This figure stood at about 75%, but this was an occasional figure as the survey was carried out every 18 months/two years.

As the library was pushing links to resources out into other systems they had noticed that this contributed to a lack of awareness amongst students of the part the library played in providing them. NSS and end of course surveys provided evidence of this as responses from students indicated that they were not sure what library resources meant, they



perceived this to mean borrowing books. The website content manager made the point that they had to find other ways of proving their value to the university. The website marketing manager added that this presented a dilemma for them because, although students were not concerned with resource provision, the visibility of the library demanded that awareness.

User feedback was sometimes contradictory; they reported one thing when in reality they did something quite different: “how someone says they are going to react to a theory of something is often different to how they react in reality to using something” (website marketing manager). The website content manager described an example of this from the mobile version of their website. Research into what users wanted from a mobile version of their website was undertaken. This research informed elements they highlighted on the website but when they looked at their GA data it showed a different picture of the webpages mobile users actually accessed.

The feedback they received suggested contradictory indicators and they knew that what worked well with one client group did not necessarily work with another. This was compounded by the fact that their student population could change on a regular basis when new courses started (website marketing manager). In addition, the website strategic manager was uncomfortable with usability testing with small groups of people, but noted that a number of reports indicated that studies of more users did not result in better data. They knew that it was not always easy to get clear information and there are compromises to be made.

#### 6.2.3.2 *Web metrics*

Following an evaluation of features and functionality of about 12 website tools, they adopted Google Analytics and had been using it for about two years. However, there were concerns about the time required to use GA. If they had the available resources they could spend time getting detailed information about every webpage in their website and looking at how they were being used. Nevertheless, they were realistic about the resources available to them and the benefit to the library in knowing that information (website strategic manager). To reduce staff time in looking at GA data, and to reduce

misinterpretation of these data, staff were provided with reports relevant to them rather than having access to the tool (website strategic manager). Google Analytics told them where visitors to their website came from but these data were not always accurate enough to be useful. It also provided information on paths through their website but unless they dedicated a lot of time analysing these it was difficult to identify trends in these data (website strategic manager).

The website content manager explained that there were things they would like to find out about their website traffic but GA did not provide these data. For example, they would like a breakdown of the proportion of students, staff or members of the public visiting their website. It would also be useful to know which courses student visitors were registered on. The website strategic manager pointed out that they had begun to try to identify use on and off campus, as well as use by students, academics and library staff. Even this proved problematic as IP address ranges only allowed segmentation in a particular way. For example, figures for on campus use were possible, but they were then unable to narrow this to use by students, academics or library staff. One issue was that all traffic was routed through the same proxy server. This was a cause of frustration for them as they were unable find out exactly what they wanted to know.

Following a change to their search functionality, all search records were diverted to an external website. This meant that they were unable to obtain sensible search data and so they were looking at other ways of tracking search enquiries through logs and Ezproxy.

Google Analytics' website overlay (in-page analytics) was thought to be a useful way of assessing which links people visited on a website. However, it had not proved particularly helpful to them because a high proportion of their links went to external resources (website strategic manager) and they found that all these links were reported in one figure.

Despite the difficulties encountered they described a number of specific examples of their use of web analytics. The website strategic manager explained that they had recently reviewed their performance indicators resulting in a reduction from 12 indicators to two.

They discovered that some of their indicators made no sense, some did not mean what they claimed to and some did not really tell them anything. One example was the bounce rate figure they were tracking. This was expressed as an average bounce rate for their whole website but it did not take into account the fact that users would be expected to leave the website from pages featuring outbound links while spending more time on other webpages. Other metrics they previously referred to included:

- time spent on the website;
- number of webpages viewed; and
- a figure comparing webpage views and the number of enquiries to the library help desk.

These seemed sensible but they were not driving any changes. Following a review of their indicators they had adopted a more targeted approach. This involved looking at entry and exit points for a set of webpages and comparing this to the previous year.

Their primary indicator was a figure based on increasing use of the website over time measured against visits. This was reported on their Balanced Scorecard of indicators as a percentage and calculated as a 12 month rolling average (website strategic manager). Other headline figures reported were page impressions and unique visitors because people were always interested in these basic statistics. The website strategic manager was also considering the cost of their website in terms of staff cost. Therefore, a cost per visit was calculated as an internal performance indicator. Analysis of one course in-depth had been undertaken, but this level of detailed analysis was not possible for all of their 550 courses (website strategic manager).

When asked whether webpage owners were interested in finding out the number of visits to their own webpages. The website strategic manager said that this was particularly useful for their blogs. Faculty Teams and Teaching and Learning Librarians had their own blogs and usage figures are used as an internal performance indicator. They also monitored guides produced by their Information Literacy Team to assess initial usage and to measure accesses over time. Another area of investigation was evaluating resource use

and return on investment. This was particularly applicable for measuring activity for the tools they had developed. They were looking at the use of a tool released as a production service, monitoring use as it diminished over time until it reached a point where it either needed to be redeveloped or side-lined.

A lecturer in ICT at the university examined a number of aspects to Library B's GA data and made these evaluations available as blog postings. This collection of posts provided detailed information on metrics studied and the outcomes of analysis. Metrics investigated included the following:

- traffic sources (VLE was a primary source) (Figure 6-2);
- location (IP) (off-campus);
- search terms (insights into navigation issues);
- peak access times (weekdays);
- popular sections (journals, databases and eResources);
- pages per visit (number varied depending on network location);
- average time on website (number varied depending on network location); and
- bounce rate (number varied depending on network location).

One focus of this study was identifying resource use linked to individual courses through VLE traffic. Filters were used to achieve this but campaign codes would have provided more accurate results. These data might then form the basis of some KPIs providing course teams with intelligence on student engagement with resources. This information would also aid understanding of the behaviours and needs of particular user segments.

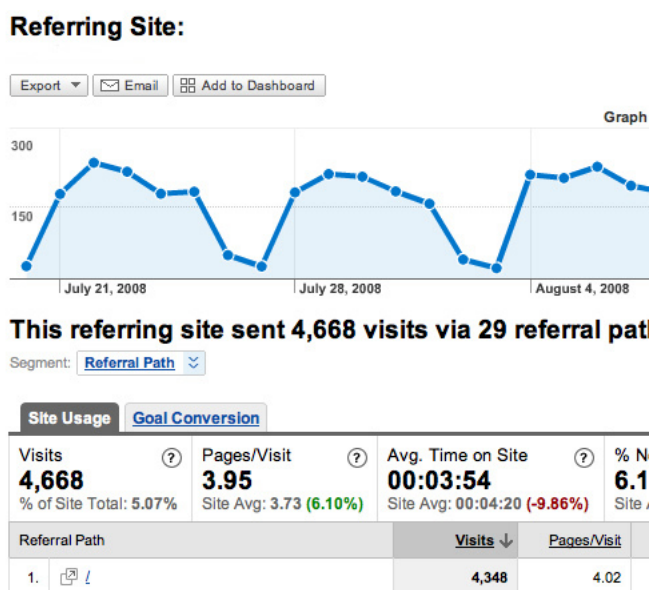


Figure 6-2: Intranet referrals: case study B

A few issues with GA were identified in the course of their investigations:

- two sources of traffic to their database page were identified where only one route existed;
- identifying user groups by referral traffic was problematic;
- the number of dial-up connections was inflated by library staff testing access to resources on a dedicated PC; and
- it was not easy to identify trends in GA data, although there was potential in exporting to systems offering visual data presentation.

The interviewer noted that reports on marketing library resources and using GA to track those marketing campaigns had begun to appear in the literature. This prompted the comment: “I am always interested in when people talk about that, whether they actually mean the success of their promotional campaign as opposed to marketing more generally” (website marketing manager). Library staff sent emails to new and returning students introducing them to their services. Through GA they discovered that website visits spiked three days after these emails were sent out. This provided an indicator to the impact these email had on student behaviour. They had tested sending an HTML email which worked reasonably well but they did not get large numbers of responses (website

strategic manager). They also tagged embedded links in the VLE, but this was less successful because their VLE system did not support all the character codes they needed to use.

One query the website strategic manager had about GA was that Google did not appear to be actively developing it. New features occasionally appeared but nothing much had changed over the past 18 months. Library staff had looked at an Excel Plug-in using the Google Analytics API developed by a third party to see whether it was an easier way of getting access to their data. After testing they decided to continue with CSV file extraction out to people for things that were relevant to them. While discussing the lack of development of GA the interviewer mentioned Google's tool for A-B testing. The website strategic manager explained that they considered A-B testing following a change to their homepage but it was important for them to maintain consistency in their web presence. Delivering different versions of a webpage presented support issues as library help desk staff were not aware which version of a page an enquirer was looking at. The website marketing manager added that they also needed to take into account instructions given to students in their study packs. In addition, it was difficult to get a consensus agreement on a single design. Although it was a good way of getting qualitative and quantitative feedback on changes the impact on students was thought to be quite high.

Apart from GA, they had information from other tools like Site Intelligence and from web server log files. They also investigated tools that presented their data in the form of visualisations. They investigated usage of library resource in different ways to their webpage use (website marketing manager). The website strategic manager explained that they used COUNTER statistics for evaluating e-resource use. They would like to have a breakdown of use by students on individual courses, but this was not available. Their ideal scenario would be an integrated system which pulled data from the VLE, library analytics and Ezproxy.

One theme arising from the discussion highlighted the need for consideration of data collection, time expenditure, purpose for the data and their ability to act on the data to make change:

*..... and that balance you were talking about earlier, between the resource that you are going to have to put in to find out something and the return on that investment. What are the improvements you are going to make as a result of knowing that? Is it even possible to make those changes (website marketing manager)?*

Along a similar theme, the website strategic manager described a move away from collecting data which were considered but where no action was taken to test the figures or to make any improvements because these data did not tell them a great deal. It was noted that their web analytics data, like other data in libraries, were often just collected from one year to the next with no action being taken on it.

Another important factor was in developing a complete picture of the user experience and how this was used to inform library staff activities. The website marketing manager identified this when commenting:

*..... it is also about the relationship analytics data has with other sorts of data we get about student use. Because, of course, you then want to understand the impact of, not just usage of, using library resources and services. And, that is where we will try and combine that data with user experience data and all the other sorts of data to give us a holistic picture of the experience students are actually getting. And, that is something that will help the Learning and Teaching Librarians and their relationships with the academics that develop the courses.*

#### 6.2.4 Corporate influence

The university had some authority over library website practices mainly through corporate brand (Marketing) and systems. As previously noted, the university was planning to introduce a CMS for use across the university and the library was part of the university information architecture. Modifications to the VLE requested by library staff

took time to implement because it was on a production server with a three-month update release cycle. One example of this was a change they requested so that they could investigate database use by students on particular courses. These data would enable library staff to provide course teams with information about their students' use of resources (website strategic manager). As faculties controlled resource budgets they decided which resources were purchased. Library staff managed this on their behalf and they wanted to give their Learning and Teaching Librarians as much information as they could to aid that decision-making process.

The researcher's review of the university website revealed that Online Services managed the corporate website strategically. The corporate website contributed to the reputation of the university and supported students and staff in their learning and teaching. To achieve their guiding principles the university's online strategy addressed the user journey, university systems, brand integrity, customer intelligence, KPIs, standards and quality assurance. They provided a style guide designed to support internal and external website users. Internally it reduced development time as some elements of website decision making were made and externally it simplified website use and facilitated a unified website message.

Online Services also considered campaign tracking taking traffic source, flow of visitors, conversion and visitor behaviour into account. Tools to track and report on user interactions were highlighted. Website analytics played a part in understanding and improving the customer experience. Online Services' insights into the purposes for measuring website traffic and usage revealed the range of activities they undertook to synthesise their data for strategic development. This included:

- accurate measuring for year-on-year reporting;
- establishing conversion funnels for key user actions;
- identifying dropout points;
- providing evidence of continuous improvement; and
- gathering intelligence on referrals.



The following sections provide a summary and evaluation of the case based on the researcher's understanding and interpretation of the available information. In addition, the conclusion highlights some key points which may be of interest, or relevance, across the UK university library sector.

#### *6.2.5 Summary and Evaluation*

The library website might be categorised as medium sized and staff maintained a number of additional websites showcasing specialist information. Their users had a diverse range of IT abilities, and, because of the nature of their student population and their unique study requirements, detailed course materials had traditionally been provided. There was a trend towards encouraging learners to be more self-sufficient but library staff had to consider legacy course materials before embarking on website change.

Delivering services through a range of systems (VLE and social networking sites) had broadened the library's online presence. This benefited students by providing them with access to library resources and help within systems they were already using. However, the visibility of the library as resource provider was compromised.

Website management and maintenance was achieved through a mix of group decision making and individual responsibility for webpages. Library staff were relatively confident IT users and this helped in webpage editing duties. There were no formal workflow processes associated with their website but editorial guidelines, training materials and opportunities were available.

Understanding website usage involved activities for gathering and analysing user feedback and website metrics. However, these forms of evidence sometimes provided contradictory information. User feedback was obtained from a range of sources including social networking websites. They were moving towards analysing their new website design and gathering targeted feedback directly through their website using polls and rating systems. Their web analytics activities had undergone review and were targeted at deriving data for more strategic purposes. Although a wealth of interesting data were

available from their analytics system they found that deeper analysis to aid understanding was time consuming.

A sample of the website metrics provided by GA along with a mapping of metrics available and those referred to during the course of the interview are presented in Table 6-5. This snapshot view of the metrics mentioned might not accurately reflect the range of metrics they investigated. However, it suggested areas where GA metrics were relevant to library staff, were not appropriate or had not been investigated.

<b>Metric</b>	<b>Available</b>	<b>Used</b>
Visitors	YES	YES
Visits	YES	YES
Page views/sessions	YES	YES
Time on website	YES	YES
Most popular page	YES	YES
Top entry page	YES	NO
Top exit page	YES	NO
Bounce rate	YES	YES
Most valuable section	YES	NO
Paths through pages	YES	YES
Referrers	YES	YES
Top browsers	YES	NO
Top platforms	YES	NO
Top video resolution	YES	NO
Search engine keywords	YES	NO

*Table 6-5: Metrics available and those used: case study B*

Following a review of their website metrics, a more strategic approach to the formulation of reported metrics was implemented. Along with a few headline metrics they focused on figures relating to specific resources (staff blogs, in-house products and subscription resources), a key performance indicator reported on their Balanced Scorecard and a cost per visit metric.

They encountered some difficulties with their qualitative and quantitative data which revolved around getting data of value to them, the time required to analyse these data, interpreting data and the conflicting information that data from different sources generated.

University influence was expressed in terms of brand, systems, budgetary control for resources (databases and e-journals) and course materials. Change brought about by university initiatives ultimately had an impact on library services. One area where change was being introduced was a new university wide CMS.

Several themes around website management, user feedback, website measurement, and corporate influence emerged from the interview (Table 6-6).

<b>Theme</b>	<b>Rationale</b>	<b>Example</b>
Website audience	A library website needed to satisfy the requirements of a diverse user base.	Constantly shifting visitor base with a range of IT skills.
Website management	Strategic management was achieved through group structure.  Individual contribution to the website was through webpage ownership, group membership and feedback mechanisms.	Groups with different remits oversaw the website. Reporting mechanisms were established.  Policies and procedures for website editors were in place.
Targeted metric analysis	A move away from uninformative KPIs and across the board data analysis to more targeted use to inform change.	Key performance indicators for the library's Balanced Scorecard of management statistics.  Cost of the website (staff) per visit.
Staff time	Data analysis was a time consuming activity.	Paths through the website were interesting, but discovering trends required additional time effort.  Detailed analysis of data for a single course was possible, but expanding this to all courses was not feasible.
Data accuracy and efficacy	Data were not always accurate or did not provide the information required, e.g., user segmentation.	Technical difficulties in getting data about specific user groups on specific courses.  GA reported all outgoing links as a single figure in the website overlay.
Understanding data	Quantitative data could be misinterpreted.	First glance view versus in-depth analysis.
Contradictory indicators	Qualitative data - users did not always act in the way they claimed.	Mobile device needs analysis highlighted requirement for access to links while reality of actual use showed a different picture.

<b>Theme</b>	<b>Rationale</b>	<b>Example</b>
Promotional campaigns and resource use	Metric data and user feedback were useful for measuring uptake of new resources.	Email advertising library services to new and returning students, mobile website and resources developed in-house.
Corporate influence through technology systems	University systems and upgrade cycles were not always the best fit for library requirements.	University website architecture did not easily accommodate the library.  VLE system adjustments on three monthly development cycle.
New technologies	Google's development of its product did not meet expectations for a more active programme of change.  New tools might be useful to students, but supporting use was not always feasible.  New tools presented opportunities to engage with users in different ways.	Excel API and Flash visualisations of data, but little in the way of real development of GA.  Students were directed to new technologies through an experimental area on the library website.  More immediate and direct contact with users through social networking websites.

*Table 6-6: Key themes: case study B*

Management of the website at Library B was established through individuals with key roles and groups to oversee proceedings. Feedback from a variety of sources informed development but these data were not always reliable and did not necessarily provide library staff with the information they wanted. Corporate influence played a part in the systems available to the library for their website presence, and in the presentation of their information and resources.

### *6.2.6 Conclusions and recommendations*

The aim of this case study was to extend the national survey findings by exploring practice at a library where user studies and metric evaluation informed website development. Four broad topic areas were investigated with specific detail and supporting examples being provided by library staff. Blog postings that recorded experimental activities with Google Analytics and university documentation provided additional sources of information. Conclusions were drawn from the information provided by interviewees at Library B. However, these were interpreted by the researcher from the available data and are, therefore, not necessarily reflective of the broader perspective of

participants in this study. It is also worth pointing out that other staff at Library B, with an involvement in their library web presence, may have yet another perspective from their experience.

#### 6.2.6.1 *Background*

The primary audience for the library website was a shifting student population with flexible time commitment to their university studies. A single website, with supplementary tools developed by library staff supported users with a range of IT abilities. The university's practice of providing students with precise instruction was changing, but it still affected the way library staff approached website change. Library staff were embracing new approaches to supporting and engaging with students. However, they were wary of the levels of support they were able to provide for new technologies and tools.

- **Diversity:** students had a range of skills and abilities and, therefore, different user experience and expectations of the library website.

#### 6.2.6.2 *Management*

A formal group structure oversaw library website development. Website monitoring activities were reported to management groups, and development activities were plotted. In this way, library staff worked towards improving their website as an on-going activity. Library staff were responsible for individual webpages and were confident in their use of IT, consequently, there were few problems with editing webpages through the CMS.

- **Balance:** individual input and ownership of webpages provided a balance to formal decision-making process through web groups.
- **Flexibility:** editorial guidelines and standards supported informal workflow processes.

### 6.2.6.3 *User studies and web metrics*

A wealth of feedback was available to library staff and this presented difficulties with data overload and contradictory indicators. They were working hard to establish meaningful data capture for analysis to inform strategic decisions. Diversifying library resource and service provision into different systems and utilising new points of contact with students added to amount of data and feedback collected.

- ***Informative data***: work with data that provided the required information.
- ***Targeted data***: refine metrics so they were informative and actionable. This tactic also reduced the amount of data for analysis.
- ***Interpreting data***: it was difficult to make sense of conflicting data.

### 6.2.6.4 *Corporate influence*

Influence from the university did not appear to be overt but nevertheless it played a part in library website operations.

- ***Corporate brand***: the library website adopted university branding.
- ***Infrastructure***: the timing of change to university systems needed to be taken into account in development, and the university architecture was not best suited to the library.
- ***Course packs***: the tradition of providing detailed course packs to students had influenced library website change.

The process of data gathering and decoding user feedback was on-going with new streams of information being adopted. Web analytics activities were being refined to meet the needs of library staff, but there were limitations on the information staff at Library B were able to get from GA and other tools. Bringing disparate sources of information together to inform website development resulted in inconsistencies in information for assessing website user behaviour. However, the strengths and weaknesses in these data were understood and issues were being addressed.

### 6.3 *Case Study C: findings*

#### 6.3.1 *Background*

This section introduces participants in this study and the scope of the website at Library C. Their website audience is described, management strategies are discussed and a website development project incorporating a usability study is explored in some detail. The part website statistics played in the website development project are revealed and potential uses for Google Analytics (GA), which was recently adopted by the university, are explored. University wide factors in library website management and development are considered. Finally, the conclusion section highlights key issues arising from this case study for Library C, and potentially for other library website managers.

Approximately five members of staff were actively involved with webpage editing within their roles as Web Manager or Web Editors for their Faculty team. Each editor had their own set of webpages and also edited content on behalf of their colleagues. There were approximately five additional staff members with responsibility for specific non-subject-related sections of the website e.g. the Map Librarian maintained webpages on finding and using maps. The university had a CMS and there were fixed templates for departmental use (Website Manager). The website at Library C consisted of approximately 700-800 webpages (Table 6-7). These webpages contained a wealth of information and advice for visitors. A large number of database guides and subject webpages were included in this total. Subjects numbered around 40 and there could be eight or nine help webpages per subject. The library also had access to over a hundred databases and each of these had a description webpage (Website Manager). Policy documents and essential content for freedom of information compliance were also available through their website (Trainee Web Editor A). Although a proportion of these webpages were not heavily used the website acted as a repository of essential information. One of the benefits of this approach was that students knew that all the information they need from the library was available in one place (Website Manager).

Website	Branding	Audience/access/content	Number of pages
Library website	Library website themed to university brand.	Current students, Academic staff, researchers and external visitors.	In the region of 700-800 pages.

*Table 6-7: Library web presence: case study C*

The library presence on the university's VLE was minimal, comprising a content block on each department's staff and student homepages, and an online course. The ethos of the university and library was for open content to support its students, staff and their many visitors. Therefore, locking content away on the VLE was not deemed appropriate.

There was considerable variety in their website user profiles:

*We've got such a diverse audience, obviously students are our main audience, but we've got staff, we've got visiting academics, and trying to get them to the information they need is a challenge I think (Website Manager).*

### 6.3.2 Website management and maintenance

The Website Manager had created a mission statement and aims for the library website team. This set out their intent and purpose in the context of the university's overarching mission. It was devised during a management course and circulated to the website team for comment. It was also available to library staff through their intranet (Website Manager).

The Website Manager oversaw website development and some of the day-to-day work through the role of Faculty Web Editor. She/he managed a team of staff with responsibility for different sections of the website. This was not the Website Manager's only role in the library; other duties include Subject Librarian, Faculty Cataloguer and other tasks as required. In reality, the Website Manager role was a half-time post, although web related work and other responsibilities were carried out in a more flexible way. Priorities and current projects dictated time allocations for work. For example, a big collections project was underway to weed stock to make way for items relocated from



elsewhere. This involved a heavy cataloguing workload, which took time away from website work. The Website Manager was also a member of the Library's Style Group and attended the university's Digital Development forum (web forum).

There were Web Editors for each of the four Faculty teams and other Web Editors responsible for specific sections of the website. They had responsibility for updating information on their own webpages and for colleagues in their Faculty or section. This work was usually routine involving editing content to reflect a change of location on a floor or updating opening hours. On occasions, it involved creating a new subject guide or information for new online resources. Web Editors were also a point of contact for people in their team and they were able to resolve website issues or, if further discussion was required, pass queries on to the Website Manager (Trainee Web Editor A). Trainee Web Editor B outlined an additional responsibility for making sure that the Monthly Info Tip and Featured Resource was available on the website. The Web Editors also participated in evaluation of the website and implementing subsequent changes.

The Website Manager and Trainee Web Editors were the most active members of the Web Team. Having input from trainee staff on a fixed term contract brought fresh ideas to website work. However, they also had different levels of competences and aptitudes related to this work (Website Manager). In addition, when these staff moved on their website duties had to be taken up elsewhere.

The Website Manager was on the Web Steering Group along with other managers and individuals from sections across the library. This group approved a usability testing study and the time required to undertake the work. After testing and analysis of results, recommendations for changes and an outline of the new homepage design were taken to the steering group where a few outstanding issues were discussed. Other input into their website came from the Marketing Manager and Information Skills Group. The latter group directed the way in which the website supported students and determined what guides were available. The Website Manager was also a member of this group (Website Manager).

One of the virtues of having a number of people editing the website was that the workload was distributed. Therefore, when broken links were identified they were passed on to the appropriate Web Editors for correction (Trainee Web Editor A).

Besides their website, news was disseminated through a weblog (with an RSS feed into the library homepage). The same people who edited the website, with a few additions, posted weblog content. They made a conscious decision to include more people (Trainee Web Editor A). For instance, their marketing manager, who has never edited the website, published news items. One benefit to this approach was that information was published instantly, rather than having to wait for one of the web team to do it (Website Manager).

### *6.3.3 User studies and web metrics*

A range of methods were used to gather feedback about their website, with qualitative and quantitative information contributing to their recent website evaluation activities.

#### *6.3.3.1 User studies*

User feedback came through a number of channels including online and face-to-face. Comments were occasionally received through online and paper comment forms. Information also filtered through help desks and individual library staff. An extensive survey specifically covering their website had not been undertaken (Website Manager). Conducting usability testing added a new dimension to their website evaluations.

When the previous version of the homepage was created, the Website Manager wanted to carry out some testing to see how well it worked, however, this was not possible. A few years later, the Website Manager thought there was time to revisit the homepage over the summer and so planning for this work began before March (Trainee Web Editor B). The focus for this work was looking at the homepage and signposting information to get people to where they wanted to go. Another issues addressed in the new design was making information more visible, such as their opening hours. A survey a couple of years earlier identified a need for this, but at the time it was not possible to include this information (Website Manager). Subject Librarians also wanted to raise the profile of the

link to their subject pages as this was below the fold. The redesign made it easier to direct students to information and the addition of a drop down menu to subject pages improved access. Another issue with their homepage was it featured too many links. A meeting of Web Editors discussed ways of reducing this number. One area they focused on was the long list of quick links and the group took the decision to reduce this number (Trainee Web Editor A).

Prior to their usability study, a brief survey targeted at specific groups of students (student shelvees, two departments student cohorts and student union representatives) and library staff was undertaken. A wider survey of students was not thought to be appropriate at that time. The survey gathered information on which sections of the website were popular, where difficulties were encountered and additional comments. Responses were received from range of staff and student users from a variety of subject areas. Their views and experiences indicated that the website provided an access point for the online catalogue, resources sections (databases and e-journals) and opening hours. Student users were usually successful in finding what they were looking for. Suggested improvements arising from the exercise were:

- to provide students with more help with finding journal articles;
- to raise the profile of academic librarians and ‘ask a librarian’;
- to include opening hours on the homepage; and
- to redesign the homepage to reduce clutter and place key information on the central area of the page.

Respondents to the survey were invited to take part in a usability study. An accessibility testing group of three library staff conducted usability testing via a task-based questionnaire. This included ten questions covering basic and advanced website enquiries such as:

- When does the main library close on Wednesday 23 June?
- You want to find some articles on food allergies. How would you go about finding them? (Website Manager).

They carried out a practice session and the process was refined from this experience. Six volunteers took part in testing and were assured that they were not being tested on their ability and it did not matter if they got any questions wrong. The purpose of the exercise was to find out how people went about locating things on the library website. One member of staff directed the test while another noted down time taken and path through the webpages. They attempted to use the think aloud protocol but some participants were not that forthcoming with their reasoning. This may have been because they were not always sure of where a link would lead as they were exploring (Trainee Web Editor B).

Usability testing proved to be informative as it provided an opportunity to observe where students struggled. Some areas of difficulty were quite predictable; they knew students struggled with finding journal articles. However, some of the paths taken through the website and some of the sticking points were unexpected (Trainee Web Editor B). No one used the search but the A-Z list was used and this was regarded as essential page to have, although it was previously not thought to be used heavily (Website Manager). In their experience unless very specific terms were input into the search box a long list of results were returned (Trainee Web Editor B). In addition, their search defaulted to the university website rather than the section currently being used (i.e. the library). To search a specific section of the website visitors had to make their selection from a drop down list which they might not have been aware of (Website Manager and Trainee Web Editor B).

All feedback on the website was looked at and summarised onto a spreadsheet. A brainstorming session followed where a new homepage design was drafted. A final version went to the Web Steering Group, Subject Librarians and Library Assistants forums. No major objections to the design were forthcoming (Trainee Web Editor B). Once an 'ideal' homepage design was agreed, the Website Manager met with representatives from the IT Web Support Team and the Branding Team. Their support for the changes was needed as they would have to do the programming and style sheets. They agreed in principal but library staff then had to wait for the work to be completed. There was a delay in getting the blog feed onto the homepage but library staff were able to add news items manually while they waited for this work to be completed.

The revised design of the homepage was quite different to their previous version (Trainee Web Editor B). Getting the main sections on the website was quite difficult as they wanted to make sure they used appropriate names. There was a feeling that text on the homepage describing each section was needed but that was something for consideration (Website Manager). The new homepage featured a section devoted to finding journal articles to assist students more directly in this area. They reduced the number of links on the homepage and by clear labelling and adjusting the layout it appeared less link heavy (Website Manager). Search the library catalogue was given greater prominence by placing it in the central area of the page (Trainee Web Editor B). A changing banner introduced more colour and interest to the page. The profile of the Featured Resource and Info Tip was increased by placing them above the fold (Website Manager).

One positive website development was the introduction of a news blog. As news items were easy to publish through this system they hoped that it would encourage greater use and a wider range of content. Posts were fed directly onto their homepage and visitors could subscribe to the news feed although the number of subscribers was uncertain (Website Manager).

Anecdotal evidence suggested that the new design was an improvement. New members of library staff, who were students at the university, commented that the new homepage was better than the previous version. One anonymous positive comment form noted that the “Website [was] very easy to navigate and [gave] useful information”. In addition, they had not had any feedback to suggest that people were unable to locate things (Website Manager).

#### *6.3.3.2 Web metrics*

During the website review, the Website Manager studied data on the number of hits to links on the homepage and main sections. These data came from the university’s statistics package for web server log files. Analysing these data helped them to identify some of the under used quick links. “It is difficult getting the balance between what we think the users need and what front line staff want on the homepage” (Website Manager). Library staff wanted some of the homepage links removed during the project reinstated.

However, some of these links were to webpages that users could easily be directed to in a couple of clicks. The Website Manager commented that she/he would rather not have too many links on the homepage.

The university had recently implemented Google Analytics and reports on the library webpages were requested. They were uncertain what access they would be given to GA and, at this time, they had not seen any reports (Website Manager). The Website Manager was interested to know whether GA provided information about entry and exit points for the website. The researcher explained that this information was available and that they would also be able to look at navigation paths through their website. This would enable them to see where visitors to a subject webpage, for example, moved on to next. It was also possible to set up a goal to map an expected path through a set of webpages in sequence. From this, it was possible to interrogate the funnel path for that goal to see where visitors entered and exited that sequence of webpages. This provided indicators to where visitors lose interest, where they were getting the information they needed and then moving on (Researcher).

The Website Manager wanted to be able to look at statistics for visits to their subject webpages to see whether making them more prominent on the homepage had increased accesses. In the redesign, they introduced a more prominent link on the homepage to email a Subject Librarian and they were interested to see whether this increased the number of email enquiries from students. The consensus from their perspective was that this, combined with the introduction of some staff photos on the website, had made them more visible and more identifiable.

In the past, web server log files statistics were presented in a graph and summarised but this work had to be stopped due to lack of time. When information from GA was made available to them they may experience the same issue of lack of time to investigate these data. They may be able to focus on a particular area of their website; looking at the use of subject and database guides; or studying a sequence of pages and seeing where people navigate away (Website Manager). Although GA may be used to inform a reduction of webpages, they noted that statistics did not reveal the whole story. Some webpages had to

be retained for freedom of information compliance even if they were not visited (Trainee Web Editor A). There was also a feeling that they could spend hours looking at the information available in GA (Website Manager).

#### *6.3.4 Corporate influence*

The university viewed the corporate website as a marketing tool and were keen to push information out to the surrounding community to make it accessible to them. There had been a drive to encourage Departments to support their students through the VLE. The VLE system was due to be upgrade soon and this might make it easier for staff to use (Website Manager). There was a CMS for departments to use as well as a brand identity and style policy with some elements fixed through the Style Group. The library Marketing Manager was a member of that group and was able to feed back any changes in university policy (Trainee Web Editors). A range of webpage templates were available through the CMS providing a degree of flexibility in design. However, the university Web Team transformed design ideas into webpage code and this sometimes resulted in a delay before someone with the time or appropriate technical skill could complete this work (Website Manager).

The university had established a Digital Development forum to consider all online content. This brought people at the university working with online resources together. The Website Manager believed that there were plans to run a session on GA. The forum was viewed as an indicator that the university was taking a more active role in developing their online presence through community practice, rather than a top down approach.

One recent forum covered writing for the Web, with a focus on navigation through the homepage, pathway webpages and destination webpages. There was a clear message that there should not be too many links within the text on the webpage. This was because links took visitors away from a webpage rather than encouraging them to read the content. Pathway webpages had to relay their intent to move visitors on to other webpages and for this reason text on these pages should be kept to a minimum. One of the things the Website Manager wanted to do was look at library website pathway

webpages making it clear that they acted as links to other pages and ensuring they were not too text heavy. Since the case site visit, the Website Manager indicated that as part of their on-going review of the website they changed all pathway pages to a different less text heavy design.

The university had also purchased SiteCheck but prior to this there was no way to check links across the university website. The library always checked their own links using the freely available Xenu link checker package, but there might be departments that had not undertaken this work (Website Manager).

A search of the university website revealed a range of information and support for website providers. Their Web Information Policy covered responsibilities, training, standards and accessibility compliance. Mandatory requirements included compliance with brand identity, copyright statement and conformance to accessibility guidelines. Best practice guidelines were also available to aid webpage creation. These offered suggestions on identifying the target audience, structuring pages for readability, design principles and metadata rules. Advice and training were presented in the form of online materials and taught sessions.

The following sections provide a summary and evaluation of the case based on the researcher's understanding and interpretation of the available data. In addition, the conclusion highlights some key points which may be of interest, or relevance, across the UK academic library sector.

#### *6.3.5 Summary and Evaluation*

The library website might be categorised as large having a central role to play as a repository of information and advice for website visitors and staff. A wide range of visitors with diverse needs had to be addressed by the website. A minimal amount of information was available through the university's VLE but there were links out to the library website. At present, the website was their preferred method for communicating information to users.



Website management and maintenance was achieved through a mix of group decision making and individual responsibility for webpages. The Website Manager had an overview of their website, library groups ratified key decisions about the website, and Web Editors update content on their own webpages and those of their colleagues.

Gathering and analysing user feedback (qualitative and quantitative) had not always been possible for a number of reasons:

- online and paper comments forms were not popular with users and minimal feedback arrived through these channels;
- a comprehensive website survey had not been sanctioned; and
- there was a shortage of time to undertake usability studies or to evaluate web metric data.

However, feedback from library staff through their contact with students at help desks, teaching sessions and personal contact provided ideas about where their website was valuable, and where users struggled to locate information or resources. They capitalised on an opportunity to undertake a usability study, with valuable insights into user behaviour and views on the website acquired. This exercise confirmed much of their prior thinking but also highlighted some unexpected activities. In particular, participants followed interesting navigation paths, search was under used and the A-Z list was more popular than anticipated. Statistical analysis provided pointers to the popularity of links on the homepage which helped them to identify under used links. This study informed the design of a new homepage, content priorities and minor adjustments to sub-sections of the website. Although they had received relatively few comments on the changes, those made were positive.

Google Analytics was recently implemented across the corporate website and they hoped to look at the information available through this software in the future. This might involve looking at specific ranges of pages, such as the subject pages, a reduction in the overall number of pages, or redesign project. However, there was an on-going issue with having the time to undertake this work. This was complicated by the fact that the Website

Manager's team of Web Editors comprise staff on fixed term contracts that may, or may not, have the appropriate skills and aptitude for website work.

University influence extended to brand identity through the CMS, systems (CMS and VLE) and website responsibilities of departments at the institution. The university implemented new systems, such as GA and VLE, but library staff were not always sure what access they would have, or what benefits would be derived. There was some flexibility in the webpage templates, but implementing changes was dependent on university staff having the time or skill to make the requested adjustments. One new initiative, the Digital Development forum, was thought to be a positive move at the university.

Several themes around website management, user feedback, website measurement and corporate influence emerged from the interview (Table 6-8).

<b>Theme</b>	<b>Rationale</b>	<b>Example</b>
Website audience	Diverse audience with a range of information needs.	The library website catered for students, staff, visitors and the local community.
Website management	Structured approach to website management through individuals with a key role, library groups and individual ownership of pages.  Strategic alignment with library and university direction.	Website Manager oversaw website development.  Web Editors created and edited content on their webpages and as instructed for colleagues' pages. They also contributed to website evaluation.  Library staff provided feedback on their own, and students, use of the website. They were invited to give feedback in the redesign project.  Website mission and aims were available.
Staffing	Website evaluation was a time consuming activity.  Website duties required skills that might not always be available.	The Website Manager role was half-time which restricted the amount and range of work she/he was able to undertake.  Trainee library staff may not have the skills and aptitude needed to undertake website work.

<b>Theme</b>	<b>Rationale</b>	<b>Example</b>
User study	Provided valuable information about the way students' interacted with the library website.	Recent small-scale survey and usability study informed website redevelopment.
Metric data	Evidence of link/section usage.  Web analytics could be used to explore specific aspect of user interaction with the website.	Server log file data were used to assess hits on links and to sections of the website for a redesign project.  Any increase in the use of subject pages since redesign could be identified. Under used pages might be identified for potential removal.
Corporate influence	Website templates carried university brand and style attributes.  Corporate systems were not always suitable for library requirements.  Initiatives to facilitate sharing of skills and experience might be beneficial.	A range of templates were provided and there was a degree of flexibility for adapting these to meet the needs of Departments.  The VLE system was thought to be somewhat out-of-date and difficult to use, although it was due for replacement.  There was an opportunity to explore issues through community of practice at the Digital Development forum.
New technologies	New technologies or systems could bring benefits to library staff and users.	Google Analytics might provide additional insights into visitor activity on the library website.

*Table 6-8: Key themes: case study C*

Management of the website at Library C was established through individuals with key roles and groups to oversee proceedings. User feedback had recently been used to inform website development, but this work required staff time which it was not always possible to commit. Corporate influences played a part in the systems available to library staff for their website presence, and in the presentation of their information and resources.

### *6.3.6 Conclusions and recommendations*

The aim of this case study was to extend the national survey findings by exploring practice at a library where user studies and metric evaluation were under used. However, the field visit revealed a considerable recent effort to extend development of the website through user study and statistical measures. Four broad topic areas were investigated with specific detail and supporting examples being provided by interviewees. University

documentation provided additional sources of information. Conclusions were drawn from the information provided by interviewees at Library C. However, these were interpreted by the researcher from the available data and are, therefore, not necessarily reflective of the broader perspective of participants in this study. It is also worth pointing out that other staff at Library C, with an involvement in their library web presence, may have another perspective from their experience.

#### *6.3.6.1 Background*

A mixed audience were served by the library website; their needs had to be balanced against those of the primary audience, students. The website was viewed as a central store of information for the library.

- **Diversity:** the library website served the needs of a very diverse user base.

#### *6.3.6.2 Management*

A formal group structure oversaw library website development. The Website Manager, with the support of Web Editors, guided this process. Those with specialist knowledge created and maintain website content as appropriate. Difficulties encountered in this process related to staff availability (time and skills). Although the Website Manager had created a website mission statement and aims, these appeared to be under used in terms of guiding website development.

- **Balance:** individual input and ownership of webpages provided a balance to formal decision-making processes.
- **Staffing:** staffing the website was seen to be an issue. Evaluation, maintenance and development work required time and skill, which were not always available.

#### *6.3.6.3 User studies and web metrics*

A recent user study and statistical evaluation affirmed library staffs' views and experiences of their website. A redesign of the homepage and changes to the website

structure identified and addressed strengths and weaknesses in the website. Further evaluation was an aim that staff at Library C hoped to achieve. Recent developments made GA available to them, although there was uncertainty whether time would be available to consider these data. Potential future investigations might focus on sections of the website, or specific projects to reduce the number of pages.

- ***User feedback confirmation and insights***: engaging in user studies provided confirmation of what was known and brought new insights into users' website behaviour into focus.
- ***Opportunities***: access to web analytics might provide opportunities to uncover different aspects of website usage.

#### 6.3.6.4 *Corporate influence*

University influence came through a number of channels. The corporate website adhered to a set brand and style, but departments had access to a range of website template options. University systems sometimes lagged behind expectations of them. Recent initiatives were viewed as attempt to encourage practitioners to come together to develop their online offerings.

- ***Corporate brand***: the library website adopted university branding, but some flexibility in styling was achieved through a selection of website templates in the CMS.
- ***Infrastructure***: university systems were not always fit for library purposes.
- ***Community of practice***: the creation of a Digital Development Forum signalled a proactive approach to encouraging the sharing of experience and expertise by practitioners.

Although library staff were unable to carry out all the evaluation activities they would have liked, mainly due to staffing levels, there remained a real commitment to improve the website for users. This extended to a program of improvement to build on their recent

website review and taking into account changes to the physical library building and online services.

#### *6.4 Conclusions*

As anticipated there were similarities and differences between the case study libraries. As examples from individual libraries, they provided context for this research. Website audience demographics were similar, with current students being the primary target group. Although students were the main target users their IT abilities and needs for using their library's website varied.

There was evidence of strategic management through website mission, website aims, project aims, and website policies and procedures for web editors. In all cases, the website manager brought a strategic overview and perspective to their library's website. Library web groups provided guidance, discussion, decision making and implemented development plans. Project groups were convened to undertake website redevelopment work. Academic/subject librarians and subject specialists fulfilled the role of web editors, creating and editing website content.

A range of formal and informal methods were adopted for gathering user feedback to inform development. Thus student surveys, usability testing, web metrics/web analytics, online feedback forms, anecdotal evidence from staff help desks, and more recently, social network tools played their part in the website evaluation process. These activities provided library staff with qualitative and quantitative evidence of the users' experiences and website activities. Qualitative data informed a greater understanding of users' actions on library websites while quantitative data gave real evidence of website use. This information sometimes confirmed existing knowledge and also added new insights to improve understanding of the way students used their library's website and to inform its development. Although these diverse methods provided complementary data there were times when conflicting information arose. In addition, qualitative data were not always gathered or forthcoming, for example, very little feedback about these libraries websites came from online feedback mechanisms. Qualitative data also presented difficulties in

accurate interpretation and did not provide some of the data web managers wanted, such as resource use by specific groups.

Limitations in effective website management and development were sometimes introduced by a lack of time to undertake necessary web work, understaffing, skills available to carry out web work and associated costs.

The corporate setting brought benefits and challenges to library website delivery. Centrally managed and maintained systems and services provided enhancements to the services libraries provided. However, these systems and services did not always meet library requirements and upgrades or adjustments were not always timely.

In all cases, the dynamics between those working to deliver their library website illustrated the close working relationships required for such a task. In broad terms, the purpose, management and development of these library websites appeared similar. Where these cases differed was in the detail of how activities were conducted and the resourcing available to carry out website work.

The following chapter brings together data from all the research activities undertaken. It provides a synthesis and analysis of librarians' website management and development activities. Key themes are highlighted and a map of evolving library website practices is presented. Information from this research is presented in a number of models extrapolated to express the different ways in which web metric/analytic evaluations are embedded into pre-established website maintenance solutions. These models are incorporated into a website improvement framework devised from the national survey data. Along with library website management and development activities, the framework also represents a wider sphere of influence as it includes university and external influences.

## Chapter 7      Discussion

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### *7.0 Introduction*

This chapter synthesises the research findings and identified emerging themes and areas of overlap from each method adopted. It is important to stress that themes were derived from library website practitioners in UK university library personnel who responded to calls to participate in the national survey and case studies. The questionnaire was advertised to 112 website managers and was completed by 69 individuals. Follow-up interviews were conducted with nine respondents. Three in-depth case studies were undertaken. In addition, data from direct observation of 130 UK university library websites presented a picture of the core features and content on these websites. Themes distilled from these data capture the experiences of library website managers and librarians based on the empirical data. Attention to ‘outliers’, libraries where a different experience or perspective to the majority was apparent brings an added dimension to the discussion. In this way, a more complete representation of current experience of library website management and development was achieved. A framework for library website development reflecting current practice within ‘real world’ practicalities was devised from the dominant experience.

The aims of this chapter were:

- to briefly discuss the methods used and challenges encountered during this research;
- to showcase key themes arising from the empirical data with reference to the research objectives; and
- to devise a framework for effective UK university library website management and development.



### *7.0.1 Research objectives*

Objective 1a. To conduct a literature review to establish website design recommendations and standard characteristics of university library websites.

Objective 1b. To analyse the content of UK university library websites to establish core characteristics and compliance with usability design guidelines.

These were achieved by a literature review and content study which informed Theme 1 and Theme 2 of this discussion.

Objective 2. To record and analyse UK university library website management and development practices, including strategic dimensions.

This was achieved by analysis of data gathered through survey and case studies. These data informed all 6 themes discussed in this chapter.

Objective 3. To evaluate the advantages and disadvantages of the methods used for establishing UK university library website effectiveness.

This was informed by the literature review with specific examples from UK university library website managers and librarians arising from the national survey and case studies.

Objective 4. To identify and describe the factors required for effective management and development of UK university library websites, and to construct a framework around these factors.

This objective was informed by the literature review, survey and case studies with key elements drawn from website practitioners' experiences.

### *7.1 Methods and challenges*

The literature review highlighted the need to focus attention on UK university library website content, management and development. This activity provided information of interest to UK and other library practitioners and went some way to redress the imbalance in the literature in terms of geographic coverage. Another notable gap in the literature related to the adoption and use of web server log file analysis and web analytic software in UK libraries. To begin to address this gap in information, this research provided much needed data on the scale of adoption and identified the ways in which web analytic data were being used by UK university library web managers and librarians. This was achieved by including dedicated sections in the online questionnaire on the benefits and drawbacks of web server log files and web analytics. Interviews and case studies provided a richer picture of specific examples of the methods employed for evaluating website effectiveness.

An overview of the content and features of UK university library websites set the scene for subsequent data gathering on website management and development activities. The national survey presented a broad spectrum of data while case studies provided more detailed information from a smaller number of libraries. The national survey represented library website management through the lens of the web manager, or person with a significant role in website delivery. The case studies presented an opportunity for a number of staff at each library to present their experiences of being involved in the delivery of their library's website. Together, these activities revealed a broad perspective to the data on website management through experiences of staff with different roles in their website.

The methods adopted allowed for a variety of inputs on a range of topics from library website practitioners. Data gathered were complementary at different levels of investigation, from general to specific and a consensus view balanced against the individual perspective. Disruption to participants' normal working practices were minimised by allowing for self-selection or withdrawal from investigations at any time. It was also possible to schedule activities around participant and researcher availability.

A few methodological issues were encountered during the course of this research. Responses to the online questionnaire indicated possible misinterpretation of terms, particularly web server log file analysis and web analytics. Some respondents noted that they believed these two activities were the same, when answering the web analytic section some respondents referred to their answers in the previous section on web server log file data. It was possible that both forms of data received similar treatment and respondents gave their answers accordingly. The expectation was that because website managers were the target audience for the questionnaire they would have an understanding of the terms used. In addition, the questionnaire was subject to rigorous testing during the pilot phase. The decision to revise the questionnaire for the national survey was made so data on both web server log file and web analytics were gathered for comparison. However, terms should have been more clearly defined for the audience to mitigate against any misreporting.

One respondent noted on several occasions that their Librarian would have to be consulted for information. This was an indication that this web manager was not aware of, or involved in, all aspects of website management and development. It is not easy to imagine how this manager carried out their duties effectively without having a full grasp on the decisions being made about their website.

Participants at one case study site were surprised by the focus on web analytics in the draft case report sent to them. Participants in any study had a right to expect that they are fully briefed about the research and their involvement. The responsibility for doing this rests with the researcher, and it is regrettable that this did not happen in this case. However, the researcher and case study participants worked together to redress the balance in the case report until the content was deemed satisfactory. In this way a more well-rounded report was produced which more accurately reflected the website management and development activities at the case site.

Using the data gathered through these research activities, a framework for effective management and development of UK university library websites was devised. This framework focused on activities within these libraries and took account of the

organisational setting. At each stage in the writing up process conclusions drawn from the research activities contributed to the development of the framework. Themes emerged from careful reading of the empirical data (questionnaire, interviews and case notes) and these were incorporated into the framework. To present as broad a picture as possible gaps or unique perspectives in these data are also addressed.

An alternative approach to the development of a framework for effective website management and development of UK university library websites would have been to map out a draft based on the extant literature. This could then have been presented to UK university library website managers for comment. This would have provided an opportunity to discuss the relevance of such a framework to UK library web managers, how closely it aligned to their situation, and where a UK based framework diverged from one primarily based on the experiences of American and Canadian libraries. The benefits of this approach were clear, however, it was not easy to envisage how feedback from a large enough sample of UK library web managers might have been sought.

## *7.2 Theme 1: website purpose*

Through this research the influence of university policies and practices exerted over the design, management and development of library websites became apparent. One significant difference that emerged from the national survey and case studies was the different purposes for library and university websites. Interviews and case studies consistently revealed a divide in this area, with the library website primarily serving the information and service needs of current students, staff and researchers. Conversely, university websites were perceived to be driven by a marketing agenda, with student recruitment being a common theme. Librarians' views were confirmed by research carried out by Cox & Emmott (2007, p.320). Their survey of UK university web managers attracted 104 responses. When invited to identify key drivers for their website, student recruitment was mentioned 64 times. This divergence in focus pointed to different user needs and different approaches to website delivery and content. It also indicated the increasing importance of a marketing focus which makes analysis of library websites

from a strategic perspective more relevant. One approach to this, which was seen in Case Studies A and B, was to determine use following an advertising campaign.

The differing website focuses, attracting new students/serving existing students, was encapsulated in the scarcity of a direct link from university website homepage to library website homepage to guide students and staff to the library website. The lack of a direct link was noted in the homepage content study and its importance to website managers highlighted in the practitioner interviews. A direct link was valued by library web managers because it provided a measure of university support for its library. Justification for featuring the library prominently arose from its status as one of the most heavily accessed websites at the institution.

### *7.3 Theme 2: website policy, design and content*

As noted above, links between university and library were not always expressed as being physical (link to library home from university home), but related to policy and technical support. In many cases, web policy and corporate guidelines delivered uniformity of website appearance and approach to website management. The national survey illustrated this well as it revealed that universities were more likely to have web policies than libraries. The website content analysis, and the national survey, highlighted corporate influence in determining library website design and content features. Thus corporate branding and the use of university website design templates influenced the visual appearance of library homepages. In particular, university logos, banners, navigation bars, search boxes and footer links were all observed in the content analysis. The online questionnaire also recorded the influence of corporate website template, content management system to enforce a common design standard, and guidelines for design and content.

Despite the emerging importance of corporate website design on library website design, this was certainly not the case for all libraries. The national survey and content study revealed unique library website designs, limited shared features, and that links between university and library website were not universally present. However, the online

questionnaire highlighted the presence of limitations on website design and content beyond corporate control. In addition, interviewees at Case Study B pointed out that altering the library website design was not always appreciated. Even small changes could affect academics' and students' abilities to locate resources quickly and existing teaching materials required revision as a result of change to the library website. In addition, one interviewee noted that academics did not like changes being made to the library website. This aversion to website change was not noted elsewhere in this research or the literature and might, therefore, be attributed to local factors unique to the library and university in question. However, it might be an area worthy of further investigation to establish whether this is an anomaly or a wider issue which has not previously been reported.

Library homepages provided options for visitors to search and navigate the library website, to communicate with librarians and to learn about library activities and events. They complied with 14 of the 20 homepage design recommendations made by Nielsen & Tahir's (2002) which were studied. However, some of the key design features they indicated were important in meeting visitor needs and expectations were absent. One area of divergence was in providing website navigation options for visitors. In particular, a library website search box on the homepage was not standard, and a website map/index was seldom available. It was interesting to note that statistical evidence of website use does not always support web design conventions. Analysis of Google Analytics data showed that a sitemap was not a particularly popular page for library website visitors. This presents library web managers with a dilemma as to whether to follow good design conventions or to design for their audience based on statistical evidence (Arendt & Wagner 2010, p.45). These factors might indicate that these guidelines were not entirely applicable to library websites, or that the recommendations needed updating as website conventions have altered over time.

The content analysis highlighted an opportunity for web managers and librarians to introduce new web technologies and social tools on their homepages. Such features recorded low figures in the content analysis. However, from the survey and case studies it was evident that this approach was not possible in some cases. This was due to a combination of corporate systems and guidelines.

Although the library websites studied shared common features and followed key guidelines for usability, one has to consider whether it is time to refocus the content and features. Nielsen & Tahir's (2002, p.2) regarded the key purpose of a website as defining the company for visitors, expressing its value over the competition, and setting out products or service offerings. The literature review identified the lack of mission statements on library homepages and students' adoption of alternative sources of information seeking in preference to library websites. This coupled with the lack of evidence of formal strategic direction (website aims and objectives) suggested that library web managers would benefit from defining these areas to inform their current website offerings and future developments.

#### *7.4 Theme 3: web systems*

Two models for university website management were identified from the research data. The first involved management through an IT department responsible for systems, web services and web technology developments. The second, through a media and publications department responsible for visual identity and content focus (brand identity). Both options influenced library website management, except where a library managed its own web server and website design. Other factors influencing library website management and development included:

- IT infrastructure, server provision, technical maintenance and development work;
- content management system and associated website template for branding; and
- training and development, including forums for sharing website experiences and expertise.

Central server provision and maintenance benefited the IT advisor in Case Study A because it freed up time for other development work. It also opened up a larger pool of staff with responsibility for system maintenance. This practice eased responsibility on the library for ensuring continuity of service provision. Central servers were also used to host digital resources enabling librarians to explore new areas of resource provision for their learners. Conversely, central provision brought some loss of control over systems and the

timing of technical developments in the example of Case Study B. Survey respondents noted that central systems did not always provide support for embedded features in the library website.

The university's chosen CMS and associated website templates brought benefits and drawbacks to library personnel. The survey highlighted the benefits of having easy to use systems with standard templates to bring uniformity of design to the corporate website. This reduced the learning curve for web editors and resulted in a more professional website design. In essence, a CMS improved the publishing process and associated website templates delivered a professional corporate website design. Drawbacks were apparent from interviews and case studies where it was reported that the website structure supported by the CMS was not flexible enough to support library needs. Training for web editors was infrequent or untimely and there was a lack of support for developments requested by library web managers.

Decision making and support processes at an institution enabled library web managers to contribute to university website policies and development. Representation on a university web group was enjoyed by 33 (48%) questionnaire respondents. The experience of Case Study C's website manager as a key member of the university web group also demonstrated the importance of this forum for maintaining an awareness of institutional website development. Another survey respondent commented in interview that they supported web developers across their institution, provided training and had some influence on university web development.

#### *7.5 Theme 4: website strategy and management*

It was apparent from the literature review that strategy and management drove website development and was, therefore, key research considerations in understanding the approaches UK university web managers adopted for developing their websites.

Considering strategic drivers for a library website, it was noted earlier that university web policy was more likely to be created than library web policy. Less than half the



questionnaire respondents' libraries had such a policy (42%), and even fewer (36%) had a website strategy document. It was possible, although not confirmed by participants, that library managers' presence on library web groups might have provided a bridge between library and university website strategy. Leading on from broader strategy and policy, specific website aims and objectives were used in this research as a gauge of targeted website analysis and change. Thirty-nine percent of questionnaire respondents' libraries had website aims and objectives, leaving the majority without these tools to guide website analysis.

The absence of formal strategy and policy documents did not preclude library web managers and librarians from being steered by another, less formal, mechanism. However, it was an indicator to a gap in strategic direction and provision of guidelines for library web editors publishing content to their website. One alternative approach to website strategy, policy documents, and aims and objectives arose from Case Study A. The practice here was to devise specific aims for website projects and these provided project focus and a means of measuring success. In other instances, library website managers were responsible for strategic direction. One survey participant recognised that website strategy should be created; however, time constraints prohibited this activity.

Pagano (2009, pp.328-332) presented library managers with a framework for their online strategy based on web metrics. His premise was that libraries should be asking open questions to drive an iterative process of analysis and development. Questions had to be measurable, and many of Pagano's sample questions were measurable through website traffic analysis. It was clear that an understanding of website traffic data and an ability to interpret these data according to the library's strategic drivers was required for the success of this process.

The online questionnaire revealed that library web managers were uncertain how website usage data, from web server logs and web analytic tools, could be used to guide their decisions. References to training requirements for these web monitoring tools indicated that staff were not as skilled in using web server log file data and web analytic tools as they could be. In other words, the role of data administrator/analyst was not well defined

in libraries. This was an area where training existing staff, or the creation of a new post within libraries, would have a positive impact on the utility of transaction data as a source of management information. This suggested that links between website usage data and website direction were not explicit. Another indicator to this was the low levels of adoption of KPIs within server log file or web analytics. Only eight of 33 respondents using server log file or web analytics had devised these key indicators to website usage. Another factor for consideration was the misleading nature of website usage data and that it was open to misinterpretation. This was noted in both the survey and case studies and was compounded by the fact that these data did not cover library web managers and librarians' data requirements. It must therefore be concluded that strategic website development based on statistical data would only evolve where an appropriate mix of accurate data matching librarians' needs, in an environment where staffing and analytical skills to interpret these data into website change prevailed.

A number of approaches to website management were recorded, day-to-day management by an individual and groups for steering and directing was common. Web groups were either formal with a view to ratifying decisions, or more informal groups of co-workers. There was also a tendency to create task and finish groups under a redesign project. Interviewees expressed a preference for small groups because larger groups tended to slow down the decision making process while a consensus was reached. Where library web groups were present, just over half included representation from senior management and professional library staff predominated. IT representation was less common, although this could be explained by the overall balance of qualified librarians and IT professionals required to maintain a university library. Managers' presence on web groups ensured alignment of the web direction with the library's strategic direction. One participant commented on the importance of teamwork in library website management, at times this was believed to take precedence over technology. It should also be noted that website management was not necessarily fixed, website projects could include looking at website roles and responsibilities, as in Case Study A. An influx of new staff members could also bring benefits of fresh input to the library website, as in Case Study C.

Delivering an effective website would not be possible without considerable input from university personnel. Staffing provision for university and library website services was a consideration for library web managers. Any deficiencies in staffing at an institutional level had an impact on library website provision. Some areas of shortfall highlighted by library web managers as impacting on their library's web offerings included:

- availability and timing of staff training opportunities;
- scheduling of technical development were not always timely; and,
- adjustments to website templates and central systems depended upon availability of university web staff, and, as noted by one interviewee, the degree to which they were engaged with their work.

As the people involved in website work were a key element alongside technical aspects, they must be considered an invaluable resource requiring considerable technical, information organising, team working, project management, liaison skills and broad range of additional abilities. Achieving such a highly skilled and dedicated workforce was dependent on the organisational factors present, and it was apparent that these were not always within the control of library management. Thus, library staff time, skills and training to undertake web duties were important considerations in effective website management and development.

Interviews and case studies illustrated that challenging areas of library website staffing occurred where staff carried out multiple roles within the library. Issues also arose when there was insufficient staff to carry out all the web work required. There was a pervasive impression that library staff felt time pressured, and sometimes had to put website work to one side to carry out other commitments. The case studies illustrated the workload some library staff experienced in relation to this one aspect of their duties. The three case study libraries' websites consisted of between 200-800 webpages. The number of staff involved in editing ranged from 10-30. This resulted in an individual's web editing workload accounting for anything between eight-70 webpages. Editors were not always content owners, but they updated content for colleagues. In some cases, defining a clear role for work was necessary, and as the website represented an area of expanding work

staffing levels were not always believed to reflect this position. The benefits of devolved website editing were apparent as it ensured a more equitable distribution of the website workload. However, ensuring that a devolved team of web editors undertook their duties and maintaining consistency across the website were both issues. Thus, it was not always easy to achieve a balance between devolved or centralised website maintenance.

This research uncovered a degree of lack of job satisfaction or frustration related to website duties where:

- library web managers were under pressure of competing workloads;
- the nature of the work was seen to be responding to negative feedback; and
- staff were not always able to undertake analysis of their website.

There was also an apparent skills gap in relation to web metrics and web analytics. Traditionally, library web workers have a background in information science, were self-taught or computer scientists. Thus, the range of skills available to library web managers did not always reflect developments in website technology, design, marketing and analytics. Availability of training in web editing was mentioned during the course of this research, but training in other areas was rarely commented on. Two examples of attendance at external training events were mentioned. In one case a member of library staff was able to attend usability training; while in another a web manager was not able to attend a web analytics in business event. It is worth noting that undertaking work on library website was believed to be an important staff development opportunity.

#### *7.6 Theme 5: understanding website use and users*

Users of academic library websites were reported to have different purposes for visiting library websites and different IT abilities. What they wanted was easy access to library resources. Therefore, website design and content needed to be flexible enough to support these diverse groups in accessing and understanding the navigation and content of their library's website.

Reasons for conducting website evaluation included:

- to gain an understanding of website users and usage;
- to monitor resource usage to inform purchasing, resource listings pages and quick links; and
- as a reaction to website change rather than as an on-going evaluation to guide website change.

Gathering user requirements was undertaken through a variety of methods. Case studies A and B demonstrated that data relating to certain user demographics (students/staff, on/off-campus, courses/module registrants) was of particular interest and relevance. Once data were available, analysis, interpretation and action for change were required to complete the website development cycle.

Research Objective 3 was to evaluate the advantages and disadvantages of the methods used for establishing UK university library website effectiveness. Web managers and librarians were aware of the advantages and disadvantages of each method and a range of website evaluation activities were, therefore, preferred over a single method. The advantages and disadvantages of the methods used are listed in more detail in Appendix H, while key themes are listed in Table 7-1 and 7-2 below.

<b>Method: user feedback</b>	
<b>Advantages</b>	<b>Disadvantages</b>
Helped library staff to understand users' actions on their website.	People did not always interact with the website in the way they claimed.
Revealed unexpected navigation choices made by users.	Only revealed the view of small numbers of library users.
Enabled library staff to respond to users' questions.	Surveys about the library website were not always sanctioned (survey overload).
Facilitated website change.	Library staff did not always have time to conduct surveys and analyse the results.
	Users did not always provide feedback when asked.
	Feedback did not always provide a consensus view.
	Students' requested things which were not technically possible.

*Table 7-1: Advantages and disadvantages to gathering user feedback*

<b>Method: metric data (web server log files and web analytics)</b>	
<b>Advantages</b>	<b>Disadvantages</b>
Statistics provided real evidence of resource use.	Current systems did not provide the range of data library staff wanted.
Statistics were used to inform resource purchase and continuation.	Data overload was an issue.
Data informed website change.	Statistics were misleading and not always interpreted correctly.
	Data analysis was a time consuming activity.
	Statistics did not reveal the reasons behind users' actions.
	Required access to root level of the web server to set up the software, which some web managers did not have.
	It was difficult to discern trends in certain areas.

*Table 7-2: Advantages and disadvantages to metric data*

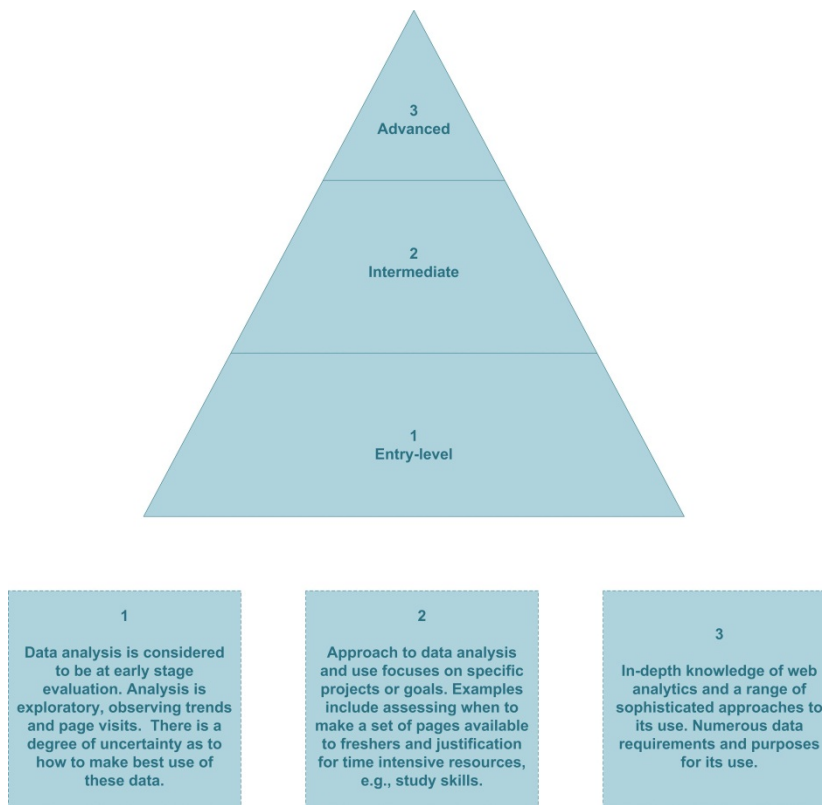
User feedback was an important aspect of library website management with 75% (52) of respondents' libraries conducting user studies. Feedback was gathered through a range of methods (qualitative and quantitative), with survey being most popular. Other options included focus groups, anecdotal evidence, and task setting. One of the key benefits of qualitative feedback was that it informed library staff about the reasons behind users' actions; it helped them to understand their website users. A limitation of qualitative feedback was that users did not always interact with the website in the ways they claimed. One interview participant noted that a range of data were required to provide a broad view of website use and experience, this lead to more effective evaluation. Another commented that website assessment was an iterative process with information from one method informing further studies. However, it was also noted that everyone has a view on how their library website should appear and that feedback provided conflicting perspectives. In addition, library staff professional expertise informed improvements to website design and content. For example, a website review would be triggered if library staff became aware of a specific issue via user feedback, or the adoption of a new university website template. Data coalesced around being user focused and making website adjustments accordingly, but with the proviso that some content had to be retained and that student requests were not always technically feasible.

Web server log file data or web analytics were both used by 48% (33) of respondents. A greater number had used webs server logs for a longer period of time. This was expected

as these data have been available for analysis for a longer period than data from web analytics software. A majority of libraries adopting a web analytic solution used Google Analytics free software. Broadly speaking, web server log file data and web analytic data were treated in a similar way. This was somewhat unexpected because the literature highlighted the different features and information provided by web server log files and web analytics. The lack of time, training and awareness of how best to use these data sources expressed in the survey might explain this anomaly.

The advantages of being able to measure effectively resource use featured in survey and case study responses. Analysis was aligned to existing resources, the adoption of new technologies and resources created by library staff. These activities were used for cost analysis and informed resource listings pages. The fact that websites were reported to be constantly changing and that future long-term direction was difficult to gauge would argue for aligning website and library direction. One web manager believed in focusing evaluation on dynamic pages and functionality. This included subscription resources, Web 2.0 and social networking. This approach facilitated awareness of the relevance of services and communications to users.

Quantitative methods provided data for general reporting purposes; statistics complemented other data analysis activities and were used to identify general trends or to inform subscription resource purchases. Information from these data helped library personnel to gain a better understanding of the use of their website, and provided real evidence of resource use as actionable data. Data were used within a project to follow usage trends, or for monitoring a specific set of pages. User studies and statistical data were consulted post website redesign to establish how well changes were received. These activities were modelled in relation to web analytics use across the UK library sector in Figure 7-1. This web analytics model shows progressive levels of complexity or targeted analytics use towards the top of the pyramid. The majority of uses for web analytics data appeared at entry and intermediate level and were typified by exploratory studies or focusing on a limited range of pages.



*Figure 7-1: Web analytics adoption pyramid*

To provide some context for this model, Figure 7-2 illustrates specific examples of web analytics use at entry and intermediate level. These examples highlight a range of web analytic uses as well as the contextual information required for interpreting these data.



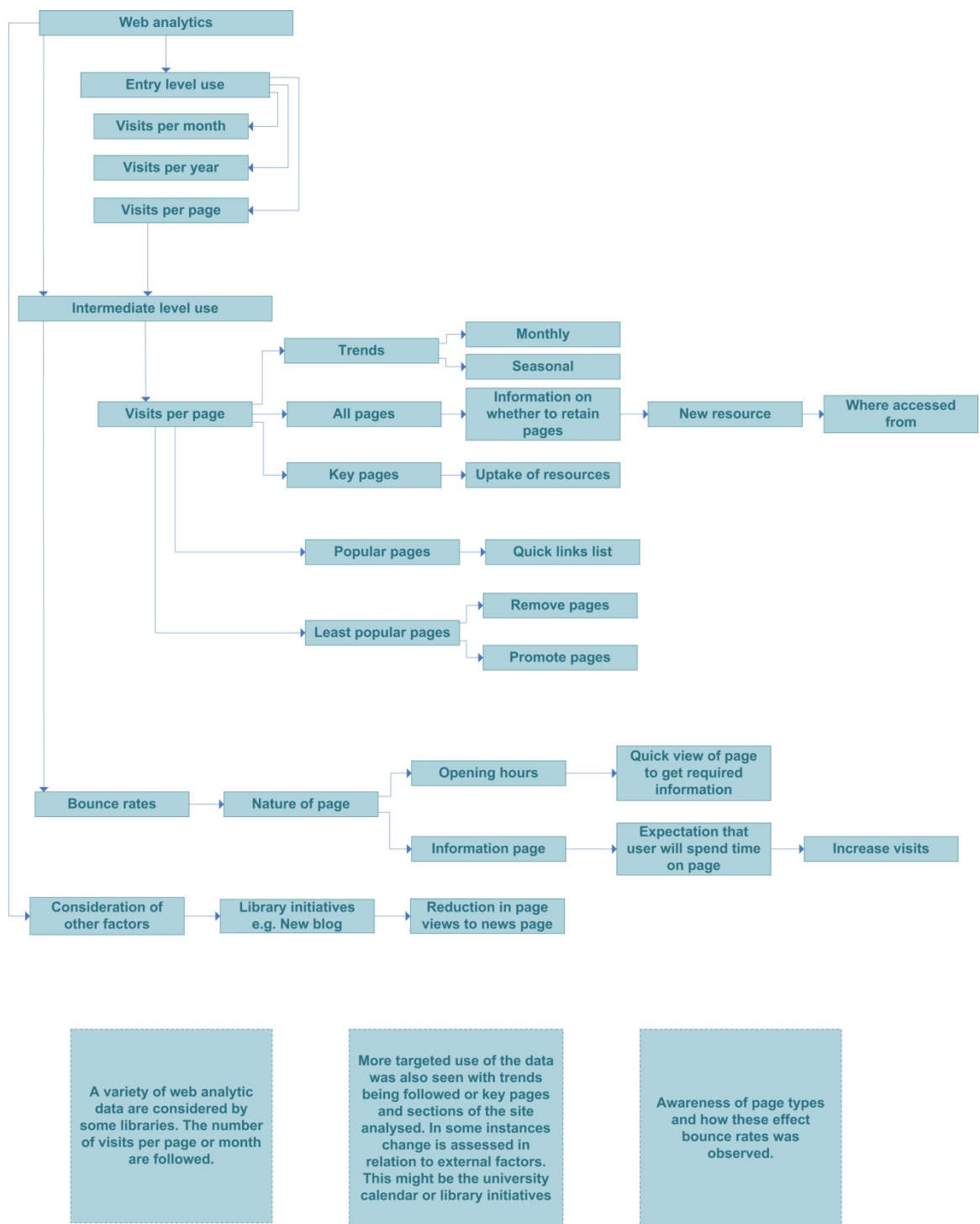


Figure 7-2: Web analytics entry and intermediate level usage model

An example of more advanced web analytic use was reported by one interviewee. Studies at her/his library progressed through a number of phases resulting in an

understanding of the potential benefits to them in analysing dynamic website content and resources (Figure 7-3).

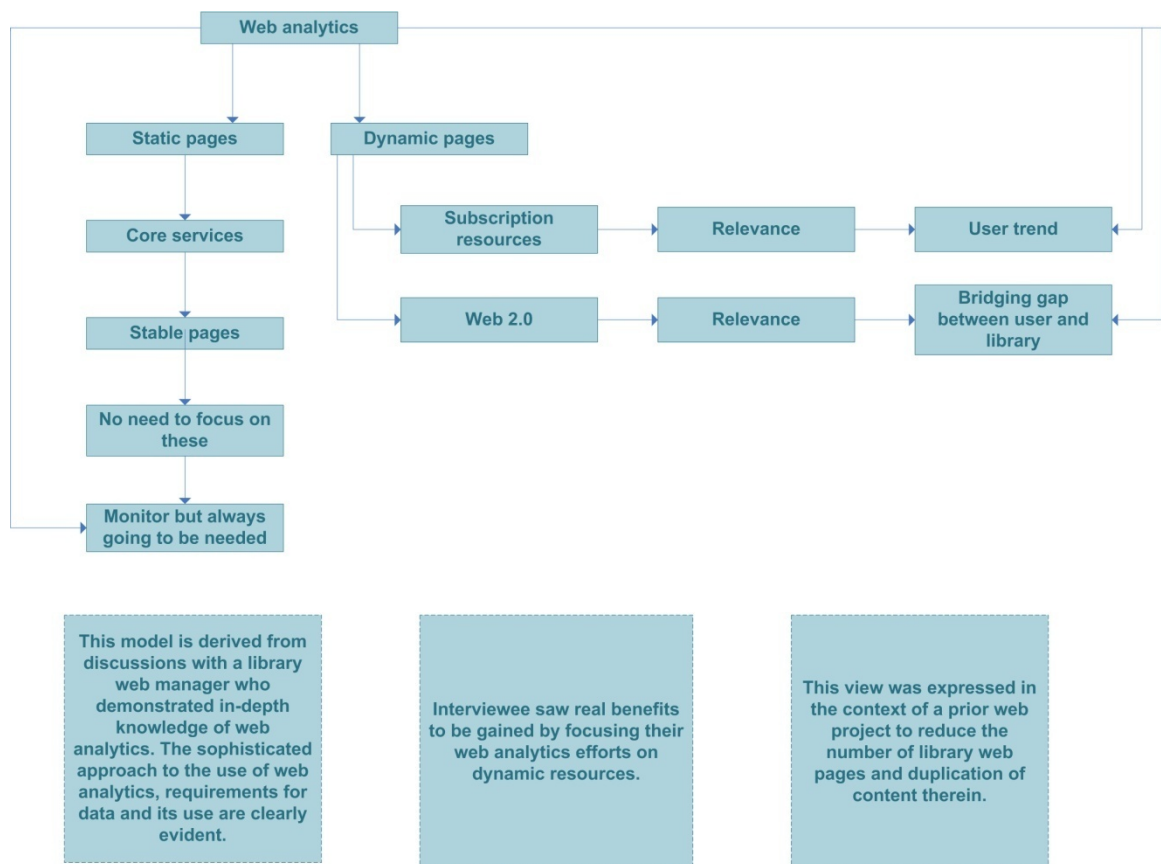


Figure 7-3: Web analytics advanced usage model

Looking to web metric/analytic data to provide information on website usage was not always a satisfactory solution for survey and case study participants. Their data requirements were not always met by the available website usage data. Concerns over quantitative data were that it did not always meet web manager and librarians' requirements. Accuracy was an issue and it was not possible to break figures down to investigate specific user groups (students, staff, on/off campus, by registered module). In addition, there were issues in management and analysis of these data:

- there was uncertainty over how to use data for decision making (server 73% [24] - web analytics 58% [19]);

- data analysis was regarded as an on-going activity, which needed to be reassessed to ensure data were fit-for-purpose;
- data overload was sometimes an issue, data analysis was time consuming and staff lacked the time or skills to undertake the work;
- not all survey respondents had access to web servers to get the data; and
- consistent data were required to accurately spot trends and this presented issues when monitoring and website publishing systems were changed.

There were examples where data gathered were not routinely or systematically used and data were rarely used for in-depth analysis of the library website or for key performance indicators. This latter point might be a result of the absence of defined strategy or measurable website objectives. However, reports on these data were provided for management and targeted teams, but rarely to page owners. Case Study A revealed that page owners may be interested in information relating to their pages. Conversely, Case Study B showed that web managers had taken the decision not to provide all staff with GA account details because of the time consuming nature of analysis and misleading assumptions based on a brief look at these data. Despite the misgivings web managers and librarians expressed about quantitative data, it provided them with real evidence of resource use (page access counts, resource usage statistics to inform webpage listings and library expenditure on resources). However, these data were not as routinely used to inform on website usability and the user journey (navigation paths or design and usability issues).

One solution to the issue of understanding website users and usage was to bring different data streams together for comparison, looking at correlations and identifying trends (Pagano 2009, p.332). Arendt & Wagner (2010, p.52) confirmed that in their redesign project information from different methods provided unique insights into website usage. In addition, information from different sources was complementary. Therefore, considering data streams within a holistic approach provided a more complete picture of website use (user experience and resource). As one interviewee noted, there was no single method for gathering feedback, and web managers involved in this research reported

inherent strengths and weaknesses in the methods used for understanding website users and use. Therefore, a truer picture of users' website experience was gained by gathering information via a range of methods. To illustrate this point, valuable insights into the reasons behind users' actions were drawn from qualitative information in user studies. However, user feedback had limitations and experience showed that users did not always interact with the website in the way they claimed. To understand usage levels, quantitative data were more appropriate. Appendix H lists the advantages and disadvantages UK university library website managers and librarians encountered with qualitative and quantitative user study methods.

A means of combining the benefits of qualitative and quantitative data to inform website change is expressed in a blended data usage model (Figure 7-4). As noted by Weischedel & Huizingh (2006, p.468) a methodology for bring these data streams together would be beneficial.

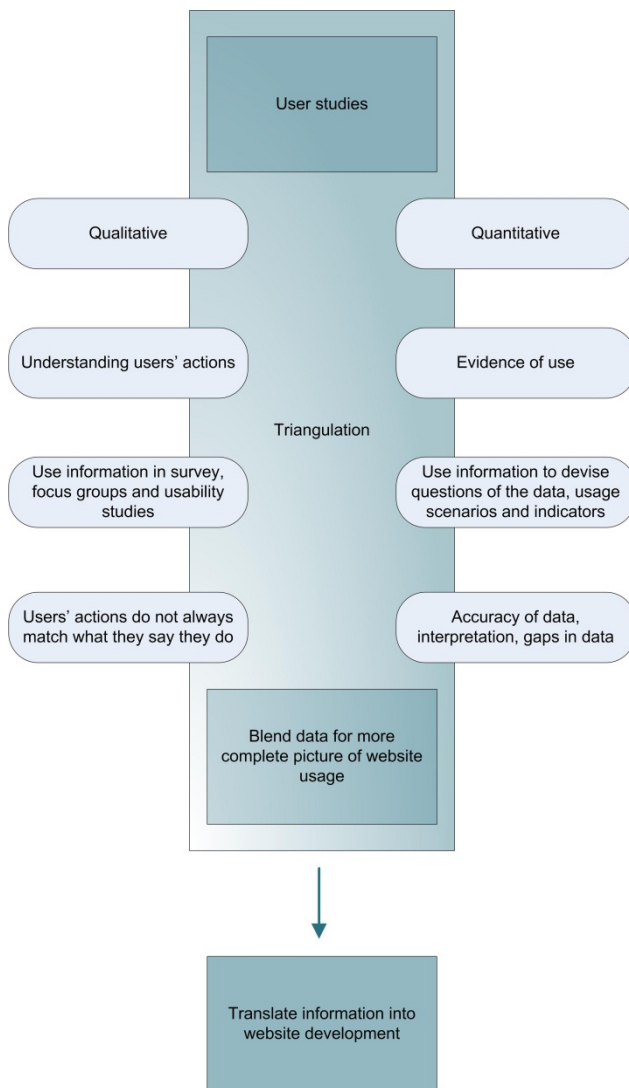


Figure 7-4: Blended website usage data

Techniques successfully used in the business sector for evaluating website design and usage were not always appropriate in libraries. For example, A-B testing of different website designs was problematic as staff support was complicated where the interface used was not standardised (Case Study B). Conversely, one interviewee identified potential benefits to be gained by learning about web analytics use from the commercial sector.

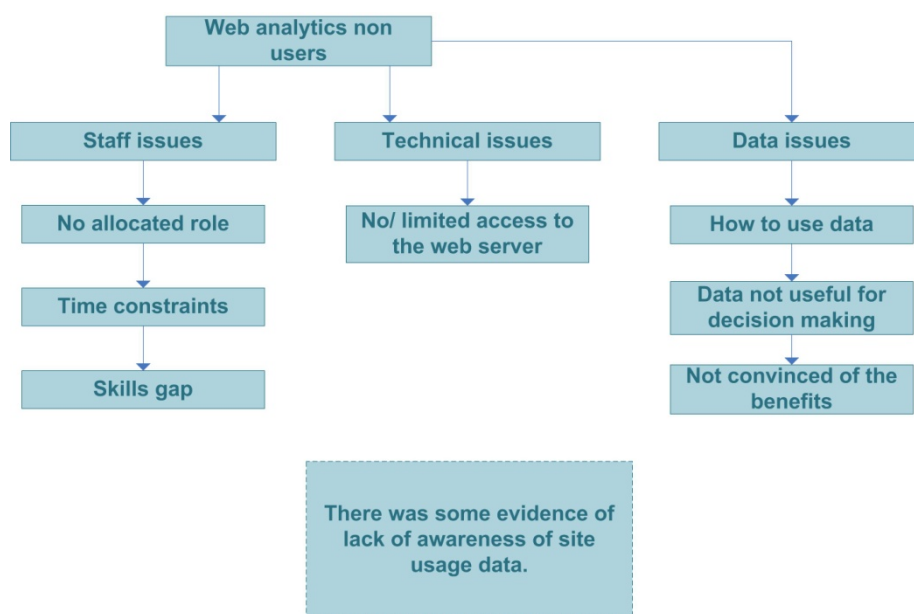


Figure 7-5: Reasons for non-adoption of web analytics

There were, of course, constraints on librarians' abilities to conduct user studies (Figure 7-5). The main issue was finding the time to carry out this work. Recruiting participants to take part in user studies was not reported to be an issue for questionnaire respondents although low response rate to student surveys was reported in interviews. Staff skill presented less of an issue where conducting user studies were concerned, although this was regarded as more of an issue in undertaking web metric studies. A lack of finance was somewhat of a deterrent to adopting web analytics, but less of an issue for user studies or web server log file analysis. In respect of web server log files, server access was a major constraint and having time to carry out this work. Data available in web server logs were not adequate or richer data from page tagging methods were preferred. The situation for web analytics was similar and one respondent noted that the benefits to be gained from such activities were not fully justified. These issues were not easily overcome but examples of practice at other libraries may provide useful leverage for change.

### *7.7 Theme 6: implementing website change and future developments*

Gathering information about website visitor experience and usage represented one stage in the website development cycle. This research highlighted the range of library website visitor types, their different needs and levels of IT competence. Visitors mixed abilities were a consideration for web managers and librarians trying to understand their website user base, information content and website design. Website content and design had to support a spectrum of users from novice to expert. Web managers and librarians were also aware that changes to their website impacted on teaching materials referring to their library's website, and were not always appreciated by website visitors (Case Study B). One interviewee commented that Academics were sometimes conservative and website change was not appreciated because they were time pressured and, therefore, wanted things to remain the same.

User feedback informed website development with changes being made in a number of areas. Where user consultation occurred, intelligence gathered informed change to library websites in over three-quarter of cases (88% - 46). A range of elements were altered including content, navigation, website structure, labels and terms, page design, interactivity, or website design. User studies were unlikely to influence technical dimensions (website code or RSS feeds). Library staff were not always in a position to make changes to all aspects of their website. The main reasons for this were constraints imposed by using corporate templates or CMS.

Website changes were implemented in response to web server log file (15: 46% - of 33 respondents using server log files) and web analytic data (12: 36% - of 33 respondents using web analytic data). This was notably less likely than with user studies (46: 89% - of 52 respondents conducting user studies). Web metric data were more likely to be regarded as evidence of resource use and, therefore, as for justification for spending, rather than to inform website usability issues.

As well as minor incremental changes, website redesigns had recently been implemented, were underway or in the planning process. These changes were sometimes driven by developments at a corporate level.

Limitations on making changes to the library website were apparent. Reasons for not acting on user feedback related to library staffs' abilities to understand and interpret web analytic data for informing website change. It was not always possible to find time to make website adjustments and web managers did not always have authority to make changes. In addition, it was not always possible for library web managers to influence changes to corporate website templates.

Through the national survey and case studies, respondents indicated that their website design or management were being transformed; or that website developments were in planning. These projects involved the adoption of new technologies, implementing a more user-focused approach to their website, or due to a university initiative. At the institutional level, it was not uncommon for libraries to be influenced by the procurement of a new CMS, portal or a rebranding exercise.

#### *7.7.1 Visibility of library services and resources*

In the light of this interview data, the role of the library website in service provision was deemed worthy of consideration. Librarians used a range of channels for providing resources to their users. This research revealed there were a number of different models for delivery of library information and services, not all of which had the website as the central locus (Figure 7-6).



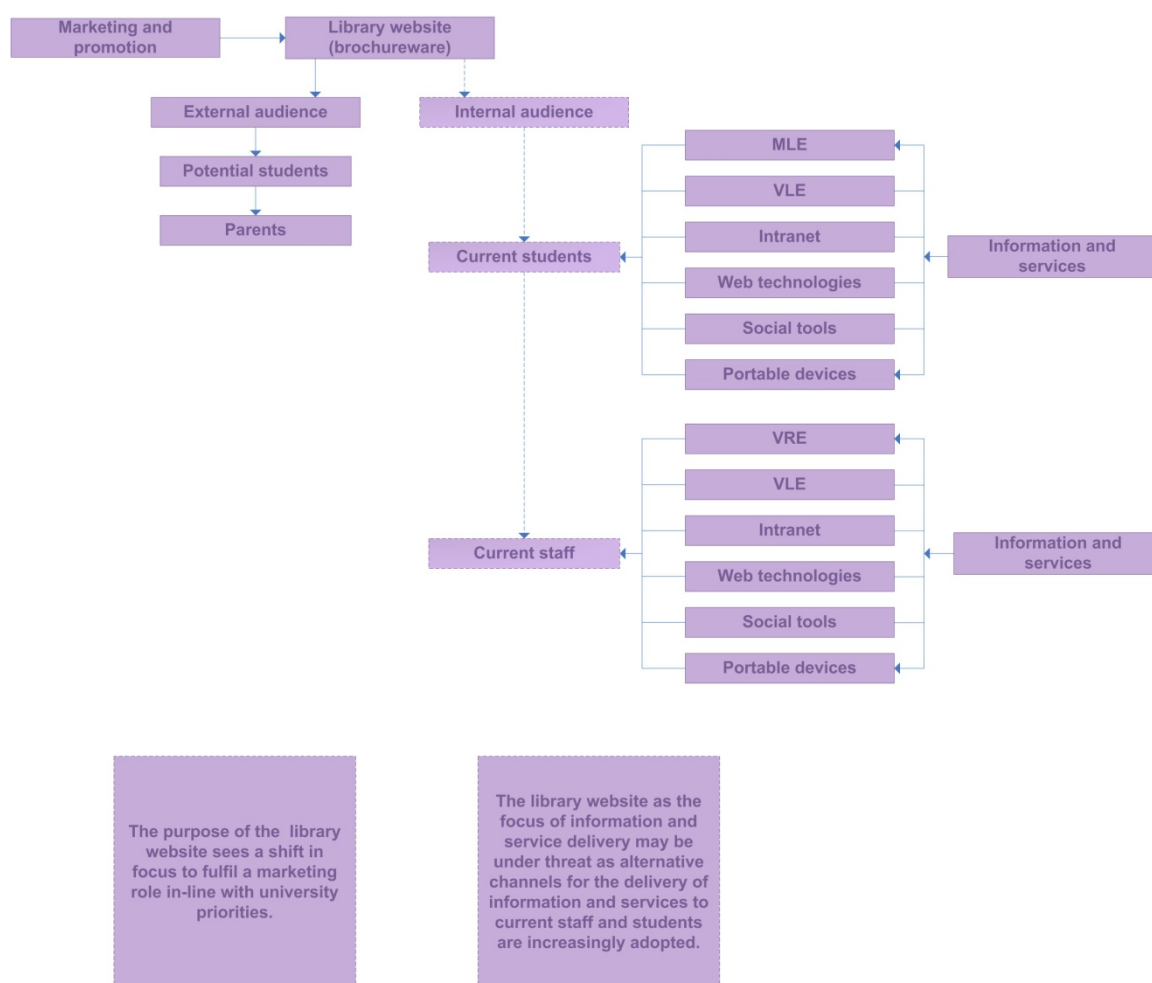


Figure 7-6: Delivery mechanisms for information and services

Interviews with UK university library website managers provided an indicator to the diminishing importance of a self-contained website as the central delivery mechanism for library information and services. It was evident that information and services were delivered through a range of university systems (VLE, Intranet, Portal), as well as independently via social websites (library presence and the creation of library widgets). Therefore, there was evidence to suggest that social software, service mashups and other mechanisms for delivering information and services may become more common place. Thus, library services may become more distributed and modular, for example the availability of widgets for use through multiple channels and devices. In this environment the central question (tenet) of this thesis: 'maintenance and evaluation of the library website' is transformed into 'how can libraries maintain brand presence/recognition and service evaluation across a range of services, tools and devices?' The implications for

web analytics under this expanded model of service provision remain unclear. What was established was that there were a number of challenges in measuring the use of web technologies, such as blogs, RSS feeds and widgets (Ferrini & Mohr 2009, p.136). The library website content analysis showed that, although not prevalent on library homepages, new technologies were being used. RSS feeds were popular with 25 (19%) providing these, mainly for news syndication; 21 (16%) also provided a library blog. Page views for these features were difficult to measure accurately because content was likely to be syndicated through a number of other services. In determining the use of Web 2.0 engagement with the content was considered to be more valuable than access counts (Ferrini & Mohr 2009, pp.136-137).

At this stage, evidence of a shift to a more 'business like' approach to managing the library website was inconclusive. In this model the customer is the main focus of attention and it could be argued that internal customers might be best served through a combination of central systems (VLE, VRE, Intranet or Portal) and new technologies. Potential students, parents and sponsors would be directed to open systems, such as a brochureware webpages. If this was the case, web analytics would provide evidence of library website activity and how this related to the uptake of university courses. This would require that university and library work together on marketing and evaluation. Ultimately, the university would take the primary role in this aspect of a library's web presence within the overall university website. Librarians' evaluations of their customers and services would then be focused upon an evaluation of the take-up and use of internal and external delivery methods. The role for a library website in providing drop-in services and information for external, non-fee paying visitors would diminish.

New developments and technologies for delivery of information and services to users were apparent. Library websites represented one of the ways library staff communicated with their users. Delivery of services and resources through other mechanisms were apparent. One unanswered question was: How do librarians manage and track usage of a range of delivery mechanisms and communication channels?

### *7.8 Website management and development framework*

To determine the organisational factors for effective website maintenance and development required investigation into librarians' current practices in relation to website management and development. Research questions on these themes and evidence gathered in the process of this research are presented in Table 7-3.

<b>Research question</b>	<b>Evidence</b>
Does strategy drive the management and development of library websites?	There was some evidence of strategy through explicit creation of website aims and objectives. It was also inferred by the presence of website groups/committees and the involvement of library senior managers in the management process.
Are data collection and analysis driven by clearly defined requirements for data?	In some examples practitioners indicated that they were not making as much use of data as they could. This provided an indicator to the fact that analyses of these data were not as focused as they could be. For example, the use of key performance indicators was not widespread.
Are methods for website improvement available and adopted?	Libraries used a range of available methods for analysing user experience and gathering views on their websites.  In some cases, limitations of time prevented web managers from conducting the analysis they would like.
Are the available metric data appropriate for library web managers' needs?	In some instances, this was not found to be the case, or the available data were too general for librarians' needs. For example, web managers were unable to get data linked to individuals on specific course modules. In other cases data for specific uses was available. For example, data for sections of the website were investigated, a list of top pages was created, or data for a project relating to the website (such as, website redesign) were gathered.
Are web managers in a position to implement and monitor change?	For some web managers the ability to change their website and its structure were governed by the systems and practices in place at their institution. The use of a content management system, or a website template, was a significant factor here. Technical constraints were also an issue for some. Other web managers reported having greater freedom to change their website to meet user needs.
What website changes are possible with the evidence currently available to library web managers?	Web managers were making changes to their websites in response to the information gathered from user studies and metric data. These changes included, but were not limited to design, navigation, page contents and interactivity.  More research was needed to identify which methods informed specific areas of website change or development.
Are data gathering and analysis activities appropriate where limitations on website change exist?	Data gathering and analysis required considerable staff time and effort and it was, therefore, wise to consider what changes could be made to the library website in response to these data. Corporate website templates clearly restricted change to design elements and other limitations influenced the content of library websites. Unless librarians could demonstrate a need for change to corporate templates and IT systems from the user perspective, requests for amendments may be less persuasive.

*Table 7-3: Factors for effective website management and development*

A framework (Figure 7-7) for library website management and development was distilled from the empirical data collected over the period of this research. The purpose of this framework was to condense the research focusing on key elements associated with website content, management and development. It also illustrated the inter-relationships between library, university and external influences. Finally, it acts as a starting point for future research to extend and challenge the framework. It was also envisaged that library website managers could assess their website management and development practices against the framework and use it as a focus for wider discussion.

The research showed that library websites were managed within the context of a university setting but external influences were rarely discussed. There was scope for participants to refer to influences from outside the university setting in the questionnaire, interviews or case studies. However, the scarcity of information on support networks, horizon scans, standards bodies, business practices or funding opportunities to develop library websites was noted with caution. Despite the shortage of information on external influences it was viewed as a potentially important area for consideration and was, therefore, included as one of the elements in the setting for library website delivery. The three elements in the framework relating to setting and context were viewed as:

1. the library,
2. university, and
3. external influences.

The importance of website audience, development incorporating user feedback, and website management approaches were apparent. The corporate settings brought opportunities and some restrictions to library website provision, management and development. Centralised systems, templates and support influenced library website delivery. These factors were encapsulated into three broad elements within the framework:

1. website content: audience and purpose;
2. website management: management approaches and corporate practices; and

3. website development: library website development activities (user studies and web metrics) and IT infrastructure.

The framework diagram presented these key dimensions in library website delivery and highlighted areas of opportunity to enhance management and development activities.

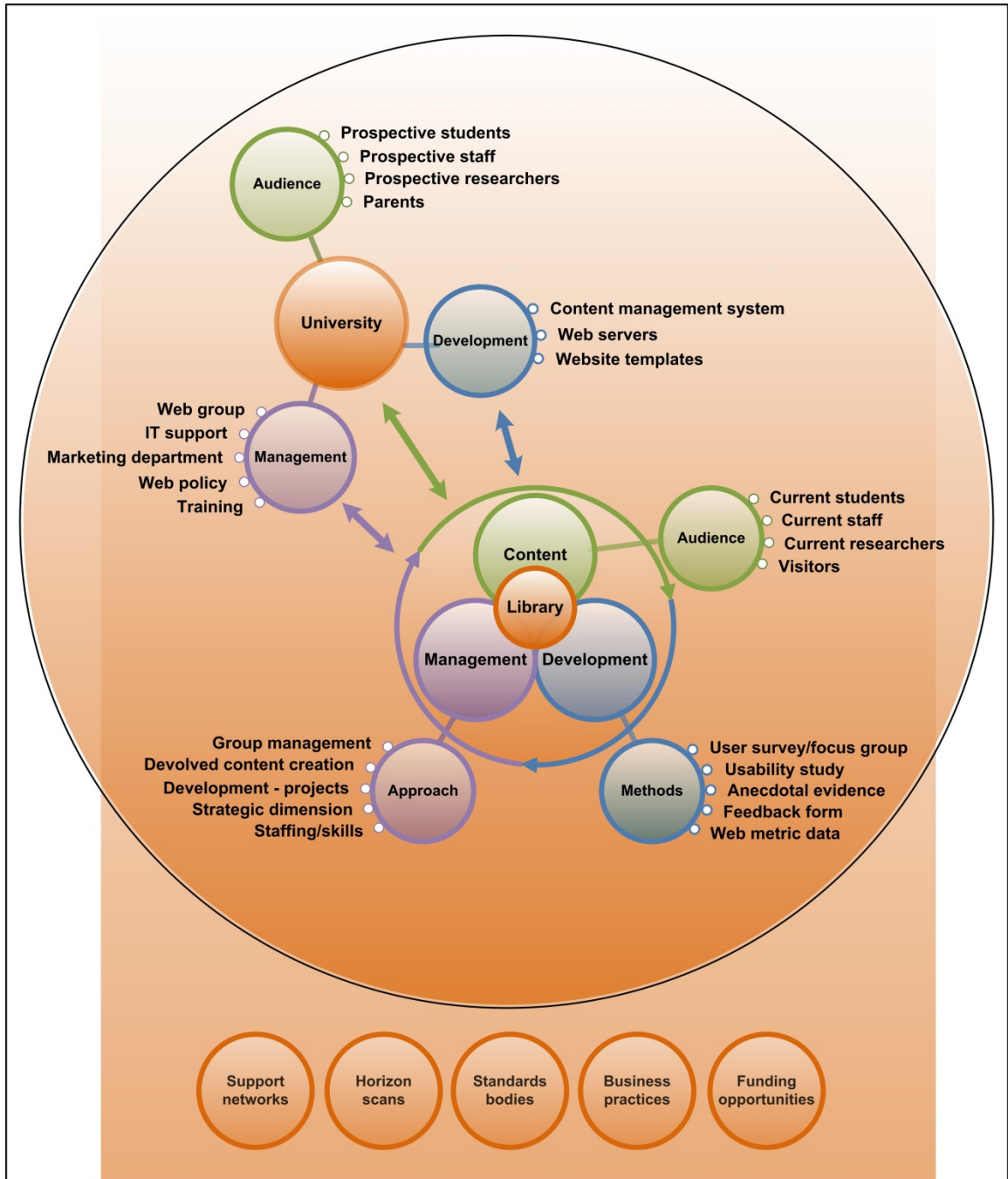


Figure 7-7: Website management and development framework

The diagram took a circular theme to suggest an element, influence or connection. Arrows were used to denote a process, influence or connection. The library website was showcased as the central feature with three overlapping circles representing the dimensions (content, management and development) bounding website delivery. The university setting was indicated by closely associating it with the library. The three associated dimensions were represented as being separate as they were found to be managed by different departments (organisational units) within the university. The library and university were further contained by encircling them with a ring to indicate their separation from external influences. Elements external to the library and university setting were positioned to the edge of the diagram due to their relatively low priority determined by infrequent mentions by library web managers. This was somewhat surprising to the researcher as it was expected that library website management would be informed by activities across the sector and wider afield. This was the case with other services provided by libraries which were recorded in statistics and evaluated by librarians in benchmarking exercises. This prompted the decision to include external influences in the diagram because of their potential to support or enhance library website delivery. For example, professional networks offered opportunities to seek advice on tried and tested methods of developing a website. In addition, horizon scans could reveal typical library website features, design conventions or new technology adoption.

Inter-relationships between elements were elaborated as connections in a network. A ring of arrows around library website content, management and development suggested the cyclical process surrounding these dimensions and the balance of their influence on the library website. Two-way arrows between library and university dimensions showed that library web managers were influenced by the corporate setting but also contributed to university wide website delivery.

Notable elements associated with each of the three dimensions of content, management and development were expressed as attached nodes. From these it was possible to see the different levels at which libraries and universities operated. University nodes were typically wide ranging in their scope while library nodes represent more localised and

contained activities. Additional detail could be added to each node extending the framework and adding further layers of complexity.

The framework diagram illustrated the focus of the content dimension as being website audience as this was a common theme between university and library. The target audience for the university website was potential students, but attracting new staff and researchers was also regarded as important. The primary audience for the library website was current students, staff and researchers. These user groups were reported to have different ages and levels of IT ability.

Where web services (servers and CMS) were provided centrally, IT developments were not always timely and functionality did not always match library requirements. Marketing sections provided a university website template which governed the look-and-feel of the corporate website. Some adjustments to design and website performance were made to meet library needs. Guidelines for web managers and training for web editors publishing with their university's CMS were available. Marketing the university website to target audiences was one of the main management themes while provision of information and services was a key theme for libraries.

Website management was organised according to the prevailing culture of the library with good team work being essential for effective website delivery. Library websites were managed by a group or committee while a web manager handled day-to-day decision-making. A team of web editors with subject or other library specialism provided content for their own webpages. Project groups were established to oversee a website restructure or redesign. Library IT support (in-house or library friendly IT staff) contributed to library website development. Constraints on development were due to limitations of the CMS and website template. Website user studies were carried out through a range of methods including questions in libraries' annual survey; ad-hoc feedback through the website and printed feedback forms; anecdotal evidence from library staff sessions; help desk and library staff website use; and web metrics and analytics. Libraries' annual survey rarely focused on their website. Analysis of user feedback within a redesign project was common. There was scope for library personnel to



investigate website strategy, policy, and aims and objectives to aid website management and development. One example of the use of website guidance documents was in referring staff to these for the authoritative word on website practice (Case Study B). In respect of the process of targeted analysis of website user activity and website change, web analytics experts recommend recording indicators against measurable website goals. Web managers and librarians wanting to develop their web analytics programme might find setting measurable goals and determining KPIs as good starting points for targeted analysis of their websites. Although the literature, and this research, did not indicate any time saving benefit in this form of analysis, it was logical to assume that narrowing the range of data under investigation would lead to gains in this area. As library web managers consistently indicated that there was a lack of time to undertake website work, and the amount of data available were issues for them, such a solution could deliver these added benefits.

There were several notable gaps in website management and development arising from this research. Sector wide support and networking was thought to be potentially useful but was not mentioned as being available. Referring to other library, or other sectors', websites for current practice did not feature strongly. Web standards were rarely mentioned and adopting practice from the business sector was seldom commented on or not encouraged. Seeking funding to develop the library website was another area that was not revealed in this research.

Potential enhancements to this framework were suggested by the representation of external influences at the margins of the diagram. Research focusing on these elements would confirm whether or not these were indeed missing from library website content, management and development activities. If present, these could be addressed in the framework; if absent greater understanding of the reasons why they did not feature would follow. There was also an opportunity to devise a number of models focusing on specific elements in the framework. One such area would be to look at website delivery technologies used across the sector identifying core systems, features, advantages and disadvantages encountered in their uses.

### 7.9 *Conclusions*

This research provided valuable intelligence about the content and features of UK university library websites, and the ways in which library websites were managed and developed. It highlighted the internal relationships between library staff working to deliver their library's website and the constraints on their actions. It also highlighted the influence of a corporate setting and how this benefited and constrained library website delivery and development. The practicalities of managing a university library website and developing it to meet a diverse group of users surfaced in the process of data gathering and analysis. These 'real world' complexities took website management and development beyond the 'ideal' suggested by theorists.

This research raised interesting questions about why web managers and librarians engaged in user studies and gathered metric data. Is this work undertaken to record website activity, or is it intended to inform change and improvement?

One of the more surprising aspects of this research was the apparent lack of networking between library web managers. There were also relatively few comments relating to horizon scans to discover current practice across UK or international university library websites, or indeed, other sectors. This might simply have been due to the focus suggested in the research questions, a lack of time to conduct such a study or its lack of relevance to web practitioners. Nevertheless, it indicated that there was scope to explore this area further and it represented an opportunity to establish a forum for discussion and exchanging expertise.

The final chapter presents key conclusions from this research and makes recommendations for UK university library managers to consider. Areas of potential future research are also discussed in brief.

## Chapter 8 Conclusion and Recommendations

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### *8.0 Introduction*

This research represented an initial attempt to map UK library website management and development activities and influential factors in these processes. It raised awareness of sector wide practice bounded by the practicalities of managing a key institutional resource for students, staff, researchers and visitors. Finally, recommendations were compiled based on the research findings and areas of future research were identified.

### *8.1 Research objectives and main findings*

Objective 1a. To conduct a literature review to establish website design recommendations and standard characteristics of university library websites.

Following an extensive review of the literature a checklist of content and features applicable to UK university library websites was developed. This checklist included important features for homepage usability determined by Nielsen & Tahir (2002) and elements drawn from a range of other homepage studies. The development of a checklist applicable to this group of websites represented a useful contribution to research in this area, and for researchers wishing to conduct similar analyses.

Objective 1b. To analyse the content of UK university library websites to establish core characteristics.

Core content of UK university library websites included features one would expect to find on a university library website (search, library catalogue, databases, contact us link, and news). Common website design features included clear menu links, a breadcrumb trail to aid navigation, neutral page background and images for visual appeal. Areas for consideration were provision of new technologies/customisation, a site map/index and clearer indication of visited links.

The debate in the literature over the gap in understanding between users and librarians over terms used to describe services in the literature was borne out on UK university library websites. Library jargon was apparent which suggested that terms used were descriptive of the services offered and user education was required to ensure understanding was in place. To aid this, any ambiguous links should be described either on the page or in ALT text.

Nielsen & Tahir (2002, p.20) stated that search was an important feature of a homepage and Harpel-Burke (2005, p.198) confirmed that this was the case for libraries. This research showed that UK university library websites provided a number of search options, but that a search box on the homepage was not a common feature. The focus on a Google like search feature for libraries was tested by Swanson & Green (2011) in their website redesign project. They found that students used a single search box inappropriately when considering the nature of a library website. Students attempted to input any enquiry they had relating to the library website, books or articles into the search box expecting to gain appropriate results. This indicated a need for caution when designing a library website homepage and matching users' experience of other websites to the library website experience.

Nielsen & Tahir's (2002) homepage design guidelines were apparent on library homepages. One area for improvement was in aiding navigation by making it clear to users which links they had followed by clear difference in colour. This would reduce user frustration in clicking on previously followed links. Another 'Essential' recommendation from Nielsen & Tahir was for an 'About' link to information on the organisation. Other studies have confirmed the presence of this link and it was therefore assumed that there were either cultural differences between research countries or that the current UK trend was not to include this information in an 'About' section.

Content analysis of UK university library websites revealed visual similarities between the design of university and library websites. The national survey and case studies highlighted corporate branding through website templates and CMS. The extent to which library website appearance was governed by conformance to university branding

warranted further investigation. These data provide librarians with valuable information on homepage content and design conventions across the sector.

There was scope for new technologies to be adopted and advertised via library homepages as the anticipated uptake of services using new technologies was not immediately evident. Use of new technologies was highlighted as important for library websites when competing against other web services (Detlor & Lewis 2006, p.254).

Data on the presence of web analytics code (page tagging) revealed a steady upward trend in adoption. This was an indicator to the interest web managers and librarians had in this emerging method of gaining intelligence on website usage. Selection of software showed a strong bias towards the freely available Google Analytics. Use of a free tool indicated that funds were not available for a charged service which was supported by the survey results. As such a large number of libraries had implemented Google Analytics, there was potential for benchmarking common statistics of library website use.

Objective 2. To record and analyse UK university library website management and development practices, including strategic dimensions.

This research indicated a different perspective between library and university website provision. This was reflected in the differing requirements for library websites stemming from differing audience demographics. It was also seen in an approach that was not as strongly directed to marketing to an external audience, as the corporate website. Indeed, as Cox (2007, p.160) noted, university web managers were concerned with making sure departmental web authors were in-line with the corporate agenda. One potential solution to this divergence in approach was exemplified by questionnaire and interview respondents. This involved developing good working relationships with university web teams over time. The respect of the university web team allowed library web managers a degree of flexibility in their approach to delivering their website. In addition, library web managers were also members of their university's web group, giving these individuals an input into web policy. However, the questionnaire also provided evidence in support of a

contrary view with some library web managers experiencing a divide between them and their university's marketing department.

Formal strategy relating to library website management was under developed. A gap in the literature relating to library web policies was noted by Hendricks (2007). His survey of librarians revealed that 54% had such policies. This research revealed that only 42% of UK university libraries had web policy documents. Other mechanisms for providing strategic direction, although not necessarily using documentation, were the presence of a web group or senior manager involvement in website management. However, some of the issues experienced by web managers and librarians concerning data overload and interpreting web analytic data could be attributed to the gap in website direction through strategy.

Staffing and the personnel involved in library website management and development were of prime importance to effective website delivery. In addition, the library web team's relationship with other departments at their institution influenced their ability to maintain and develop the library web presence. Understaffing and resourcing the library website placed constraints on web managers and librarians in their work. This was apparent in the availability of staff, time allocated to web work where roles involved other responsibilities, the priority given to web work and the skill set of those involved in web work. These factors contributed to web managers struggling to undertake user studies, evaluate data from server log files and web analytic software, and in their ability to ensure colleagues web duties were carried out. Ensuring web managers/committees had appropriate authority to carry out their work was noted (Felker & Chung 2005, p.59; Griffiths 2004, pp.71-72; Shropshire 2003, pp.98-99). Budgetary constraints could have hamper development of the skills required to undertake web work and website evaluation (Church & Felker 2005, pp.547-548; Griffiths 2004, pp.71-72). This research showed that only 20 (29%) UK library web managers had full control over their website budget but 29 (43%) had no control. Considering the key role a library website has in service provision it is somewhat surprising that library websites are understaffed and resourced in several areas. For this reason, library managers may wish to consider issues of staffing

and resourcing for their library website and, where possible, address any shortfalls in staffing levels, staff roles in relation to the library website and skills gaps.

In addition to staffing, there were other operational influences on library website provision. These were driven by internal or external factors associated with technical infrastructure and corporate setting. Corporate influence was evident in a number of areas relating to practice, technical infrastructure (systems), policy, marketing, website template and meeting libraries' website support needs. Web managers benefited from a technical infrastructure provided and supported by service departments at their institution. This included provision and maintenance of servers for website delivery; use of a content management system; consistent and professional look and feel provided by the CMS and website templates; and support for development work, adjustment to website templates and training. However, corporate influence also introduced some drawbacks as systems did not always meet web managers' requirements; development work was not always completed within reasonable timescales; university website templates and branding prevented web managers from developing their website in the way they would like; and overstretched university web teams were not able to provide reasonable levels of support. Similar issues were reported in the literature by: Fulton (2010); Hendricks (2007, p.143); Lombard & Hite (2007); and, Peterson (2006, pp.218-220). Hinton (1998) and Cox & Emmott (2007) provided university web managers' perspectives on the complexities of administering the corporate web presence.

Examples of good practice for working within the corporate setting uncovered during the course of this research included building good relations with university web managers and teams; gaining representation on the university web group; using statistical evidence to make a case for a direct link to the library website from the university homepage; and networking with web managers across the institution. These examples could be used by library web managers to advocate improvements at their own institutions.

University web managers need to understand the important role they have in supporting departmental websites and web authors. Departments need to be considered when determining the technical infrastructure and systems, designing website templates, and

supporting web development and editing. These considerations were evident from this research, but library web managers indicated that improvements in both technical infrastructure and support provision could be made. Research by Cox & Emmott (2007) suggested that some of the shortfalls in provision might be attributed to resourcing deficiencies. However, there was scope for library web managers to continue to promote their web related requirements through existing communication channels and by developing new opportunities for representation. Library website end user requirements, gathered from user studies or web analytics, could be used to illustrate the case for visibility, technical development or other aspect of website delivery.

Internal and external drivers for change arose out of library website development and university change cycles. Library web managers were engaged with redesign projects and management processes reviewed. University influence was apparent in relation to website design and branding. The influence of library website uses and usage in the process of website development were explored in the next research objective. Library web workers' skills mix and time availability in relation to library website practice was an important consideration for effective website delivery. Therefore, time and staff allocations to website duties and up-skilling staff to reflect the change in website management needs to be prioritised.

Objective 3. To evaluate the advantages and disadvantages of the methods used for establishing UK university library website effectiveness.

Library web managers actively encouraged users to give feedback on their use of the library website. A range of different methods were employed to achieve this including questionnaires, feedback forms and website usage data. This information was used to inform library website development.

Methods for gathering feedback were used in combination, with qualitative data valued for the perspective it gave on library website users' actions on the website, while quantitative data provided persuasive evidence of resource use. This informed purchasing and gave definitive answers to questions over which items should appear on the



homepage. Information derived from these consultation activities sometimes proved both complementary and conflicting.

Web analytics played its part in evaluation activities, but there were issues with using the data to inform changes to website design, and assessing the impact of change was problematic. Being able to interpret and use web analytic information effectively surfaced in questionnaire responses, interviews and case studies. There was undoubtedly a learning curve associated with the adoption and use of any new system. This was coupled with a lack of time to devote to this work and lack of specific training to undertake analysis and interpretation of web analytic information. These factors contributed to its underdeveloped use as a tool to inform website usability. As staff were generally 'time poor', low impact methods of collecting and analysing data to inform website management and development were preferred.

Apart from the internal constraints on library website evaluation activities, it was clear that the available web metric data were not always suited to library staff needs. This limited their options to working within the constraints of available data for gathering insights into their website, looking to technical solutions to gather the data they required and identifying other tools to provide the range of data needed.

Despite the amount and range of data available to web managers these were inadequate in a number of areas. For example, web managers were unable to gather web metric data on the activities of specific user groups, and key information to inform resource use was not available through either web server log files or web analytic software.

Improving staffing levels, time availability, and skills to analyse and interpret data to inform website change would enable library personnel to gather and user data on website usage and experience more effectively. It should also be noted that in-depth analysis of data was not always required as identified in Lewis & Hepburn's (2010, p.411) card sort usability study. This view was not supported by Fakis & Hyland (2000, pp.355-356) who noted that, despite the time consuming nature of their card sort study, it provided valuable insights into user oriented website organisation.

In light of these research findings an important question was whether it was a useful exercise for library staff to pursue website analysis and evaluation where there were limitations on adjusting management practices, website design and development. Amongst the limitations expressed included design, navigation, content (wording and resources), embedded features (new technologies), staffing, skills and access to data/servers. The scope of such an analysis might include costing website work and tools used in delivering and analysing the website. It would also involve measuring the value of the library website to users and library. This might be presented as a weighting of benefits measured against other delivery mechanisms and performance evaluation through KPIs. Value of change would need to take into account areas of the website where change was not permitted.

Objective 4. To identify and describe the factors required for effective management and development of UK university library websites, and to construct a framework around these factors.

This research revealed a range of approaches to website management and development. The multiplicity of approaches reflected the complexity of the processes and tasks involved in delivering a library website. Devising a framework for effective website management and development involved taking key variables, identified in data gathered from library website personnel, and presenting them in a fluid context. In this way, influences were suggestive and elements could be considered to be influential in their own right, or part of a broader category of influence. The library was presented as a cluster of closely associated factors influenced by the corporate setting, and in their turn influenced corporate website management and development factors.

The practicalities of operating a website within a corporate setting sometimes constrained library website management and development. Internal constraints also existed and these included limited time to undertake website duties, lack of appropriate skills to evaluate metric data, and a general shortage of resources and budget. Despite this, there were many examples where website user studies provided useful information for library web managers. These insights were used to make changes to their websites bringing benefits

to users through improved content and design. However, the benefits of gathering website user feedback needed to be weighed against the value this information had for library web managers and their ability to act on it. One area where decision making was constrained by corporate practice was where corporate website templates enforced a strict design convention on a library's website design.

Library web managers might like to consider a starting point for their website evaluation as a calculation of the cost of running their website. This would include a cost per page metric as well as staff and resource costs. This information would aid decisions on which webpages to retain when rationalising the size of a website. In addition, creating KPIs linked to library strategy represented a more focused use of web analytic data.

Sharing examples of practice would help to raise awareness of management and development activities across the sector. One area where this would be beneficial was in the use of web analytics, and as Google Analytics was widely adopted across the sector there was potential to share experiences and standard usage data.

Based on the research data it was clear that website delivery was achieved as a result of a combination of factors that determine the management and development approaches taken at each library. Efficiency gains in relation to website management and development might arise from establishing a strategic web development and maintenance plan; devising a schedule for evaluating website usability and visitor experience including a range of study methods; monitoring and assessing website usage, and developing the website to reflect the evidence of changing patterns of use.

## *8.2 Research contribution*

This research provided an appreciation of the problems and opportunities encountered when managing and developing a library website. It also offered valuable examples of current practice across the UK university library sector. Readers will have gained insights into the content and features of UK university library websites, strategy and management, personnel involved in website delivery, feedback mechanisms and the ways in which user

experiences informed development. Through the research conducted, the scale of web analytic adoption within this group of libraries was established. The benefits and drawbacks of this method of website evaluation were contributed by library web managers from their experiences of implementing a web analytic solution.

From this research a framework of library website management and development was devised. This framework included areas not highlighted during the course of this research which might contribute to the management and development of UK university library websites. Approaches to bring improvements to management and development processes were also proposed.

### *8.3 Implications*

#### *8.3.1 University web managers*

As identified earlier, university web managers needed to ensure their systems, website templates and support offerings were flexible enough to meet the needs of departmental web managers and editors. Library web managers and senior managers could facilitate this situation by promoting their needs in supporting library website users, and in promoting the services available to potential students and research staff. This research provided an adjunct to that of Cox & Emmott (2007) as it evidenced library website management and development activities within the university setting.

#### *8.3.2 Library website managers*

This research provided a view of current library website management and development activities across the UK university library sector. The national survey presented an overview of factors involved in website management and development, while the case studies provided a more detailed picture of a limited number of cases. Library website managers could use these data and examples for comparison to their own library website management and development practices and activities. Approaches at other libraries might be adopted or used to persuade senior managers to consider local change.

### *8.3.3 University library sector*

There was considerable scope for the development of a support network for library website managers. Such a network would provide valuable advice and guidance on key aspects of website management and development. In particular, web managers were interested in website staffing levels and reported a degree of uncertainty in how to use web analytics to develop their websites. Provision of examples of good practice, case studies, and the potential for sharing website usage data represented a few examples of potentially useful resources.

### *8.4 Limitations*

1. As an exploratory study there were some issues with the terms used in the questionnaire. The issue of common definition of terms was apparent elsewhere, but this could have been addressed by more specific guidance to participants.
2. The libraries involved in this research were not grouped by size of institution, age of university, strategic groupings (1994 Group, Russell Group, and so on) or focus (research or teaching). These organisational groupings were used by researchers to focus their findings to their intended target audiences. The audience for this study was defined as broad based, although it is acknowledged that grouping libraries by themes would make findings more relevant to web managers and librarians within those specified groupings.
3. This research concentrated on the UK university library sector and, therefore, findings may be of limited value to web managers and librarians in other countries.
4. The appropriateness of the library website management and development framework devised from the research data was not passed to web managers for comment.

### 8.5 *Recommendations*

1. Library web managers should devise website policy and aims/objectives to guide web editors in producing their pages and for steering website development. These should be used strategically to aid website management and to provide measurement for evaluation of user feedback (evaluation and feedback to an achievable level).
2. Library web managers should build measurement and evaluation into an on-going cycle of development, rather than at pressure points, such as a website redevelopment or change to university systems.
3. Library senior managers should prioritise web work and, where possible, increase staff allocation and time for website duties.
4. Library staff should be trained in website evaluation using web analytic software.
5. Library web managers should continue to strengthen or build associations with university web and marketing teams.
6. Library senior managers and web managers should continue to raise university awareness of the importance of the library website and the unique nature of this valuable resource.
7. Library and Information Science courses should equip future generations of librarians with the skills required for managing and developing a library website in the context of wider service provision. Emphasis should be given to strategic planning, marketing, evaluation methods, analysing and interpreting data, and transforming analysis into website change at all levels.

### 8.6 *Further research*

- Website content analysis: undertake a benchmarking exercise against other library websites (America, Canada and Australia) to establish international design and content conventions.
- Website content analysis: there is scope for the needs of different user segments to be addressed in an evaluation study of library website content and features. User

requirements gathering prior to analysis would facilitate identification of any mismatch between users' expectations and library website content and features.

- Compare and contrast university and library web administration looking at:
  - staffing services;
  - technical infrastructure;
  - university and department requirements;
  - marketing;
  - processes/workflows;
  - communication mechanisms;
  - end user needs requirements; and
  - training provision.
- Compare library homepages with those of other sectors, such as, ecommerce, companies, charities or government to establish commonalities and differences. Investigate whether website purpose and user needs are influential factors in the results.
- It would be interesting to unpick areas of website control, for example in the case of website design, what area of the design are web managers able to change/influence. Within a website template it is natural to assume that library web managers are able to make design adjustments to the main content area. This would exclude banner, footer, main navigation. However, this may not be the case in practice.
- Gather library requirements for effective web analytic use, provide mechanisms for library web managers to share experiences and exchange examples of practice, facilitate practitioner case studies and create a series of web analytics tips, examples and advice sheets.
- Explore the possibilities for sharing and benchmarking web analytic data across the UK university library sector. Standard metric data may be available from libraries using the same web analytic software (Google Analytics). Potential activities would include:
  - Identification and development of a list of data requirements for benchmarking activities, i.e., standard set of metric data for comparison.
  - Identification of standard definitions for these metric data.

- Identification of the main barriers to benchmark data: local configuration of software, local systems deployed, reaching agreement on benchmark data, librarians' expectations/data requirements, costs, time, staffing and so on.
- Identification of a suitable host organisation for collation and analysis of standard web metric data.
- With UK university library website managers: develop a blueprint for effective website management and development based on this research, further rounds of empirical data gathering and practitioners' experiences of website management.



## Chapter 9      Bibliography

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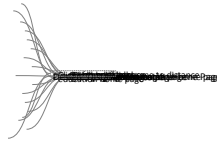
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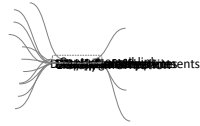


Appendix A. **MAPS OF WEBSITE ELEMENTS**

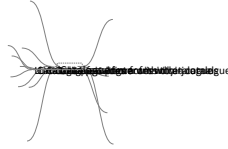
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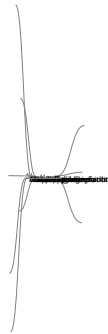
Adams & Cassner 2002



Cohen & Still 1999



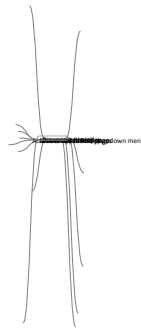
Detlor & Lewis 2006



Gardner, Juricek & Xu 2008



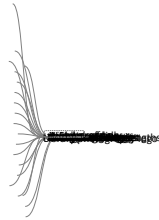
Harpel-Burke 2005



Manuel 2008

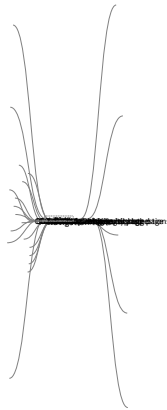


Nielsen & Tahir 2002



Osorio 2001





## Appendix B. USER STUDY METHODS: ADVANTAGES AND DISADVANTAGES

The following Tables illustrate the advantages and disadvantages of user study methods reported in the literature.

Method	Advantage/disadvantage	Reference
Survey	<p>Provided information on user experience; straightforward process; views of large group of website users.</p> <p>Highlighted navigation problems and terms which were not understood by users.</p> <p>Highlighted need for a simple website design with clear signposting to navigation/website structure.</p> <p>Informed other methods.</p> <p>Limited by location, which affects the survey sample.</p> <p>Poor response rate; generalisation not feasible; sample bias; misleading results.</p>	Fang 2007; Felker & Chung 2005; George 2005; Harley & Henke 2007; Lewis & Hepburn 2010; Rogers & Preston 2009; VandeCreek 2005
Interviews	<p>Highlighted areas where users need assistance.</p> <p>Informed card sort exercise.</p>	Tolliver <i>et al.</i> 2005
Focus groups	<p>Valuable data gathered.</p> <p>Provided suggestions for website improvements; identified issues with information architecture and terms.</p> <p>Information difficult to quantify.</p>	Rogers & Preston 2009; VandeCreek 2005
Student and staff comments	<p>Website visually unappealing; font size too small.</p> <p>Some content difficult to locate.</p>	Arendt & Wagner 2010
Cognitive walk-through	<p>Useful in early design stage for assessing problems end-users may encounter.</p> <p>Highlighted areas where design could be simplified; links reduced; profile of links raised; confusing terms; poor colour choices.</p> <p>Usability engineers usually perform the walk-through, but library staff substituted due to lack of experts or budget to commission them.</p>	McMullen 2001

<b>Method</b>	<b>Advantage/disadvantage</b>	<b>Reference</b>
Heuristic evaluation	<p>Test against accepted design heuristics; minimal training required.</p> <p>Does not provide solutions to problems.</p> <p>Does not involve end-users; unlikely to use again; not used due to time constraints.</p>	Felker & Chung 2005; Tolliver <i>et al.</i> 2005
Usability testing	<p>Revealed insights into the way students use the website. Users scan for hyperlinks and heading, they do not read the text.</p> <p>Identified user requirements, preferences and mismatch between their experiences of the website and their actions on it.</p> <p>Highlighted issues with design, website information architecture and library terms; need for context sensitive help.</p> <p>Patterns of use emerged with same difficulties and misunderstandings being repeated.</p> <p>Confirmed known issues with the website.</p> <p>Features implemented on other library websites may not be appropriate for the local user base.</p> <p>Participants observed in carrying out their own research tasks on the library website.</p> <p>Remote testing: may require software installation on test users' computers; software costs incurred; firewall issues may be encountered by screen viewers; screen recording software does not capture users' behaviour; administering and facilitating testing complicated at a distance; recorded sessions can be replayed for detailed analysis; equipment can be as intrusive as having an observer present; making notes from a recording takes longer than in a test session.</p> <p>Time consuming and staff intensive.</p> <p>Difficult to recruit participants.</p>	Felker & Chung 2005; Holland 2005; McGillis & Toms 2001; McMullen 2001; Rogers & Preston 2009; Speight & Perkins 2007; Swanson and Green 2011; Thompson 2003; VandeCreek 2005

Method	Advantage/disadvantage	Reference
Card sort	<p>Benefits of involving students in the method and data entry/analysis; categories determined by participants and are, therefore, meaningful to them.</p> <p>Used to determine website structure; new ways of organising website content became apparent.</p> <p>Used in conjunction with other methods and library staff expertise; confirmed findings of other methods.</p> <p>Method and data analysis time consuming and costly; scan of raw data almost as effective.</p> <p>Wording on cards in closed sort study may influence user placement into categories.</p> <p>Technique used did not involve website use and, therefore, did not inform usability.</p>	Fakis & Hyland 2000; Felker & Chung 2005; Lewis & Hepburn 2010; McMullen 2001; Rogers & Preston 2009; Tolliver <i>et al.</i> 2005
Prototype	<p>HCI students created prototype based on prior feedback.</p> <p>Iterative process; designs tested in HTML editor and with variety of web browsers.</p> <p>Identified issues with website layout and structure before implementation of new website; users find their own paths to content; identified terms which were not understood by users.</p> <p>Conducted at various stages in the website redesign process.</p>	Felker & Chung 2005; George 2005; McMullen 2001; Tolliver <i>et al.</i> 2005
Think aloud protocol	<p>Library terms presented barriers to website navigation.</p> <p>Small number of participants.</p>	George 2005
Wire framing	Complex method so paper prototyping used instead.	Tolliver <i>et al.</i> 2005
Horizon scan	Ideas gathered by looking at other library websites; identified approach adopted at similar institutions.	McMullen 2001; Speight & Perkins 2007

Method	Advantage/disadvantage	Reference
Web analytics	<p>Google Analytics was easy to set up; data visualisation provided at a glance overview of website activities; persuasive usage evidence; trends; navigation paths, popular pages; data overlay on webpages; data on visitor segments; data export feature; informed website redesign and follow-up analysis; reports on numbers; peak usage times; screen resolutions in use.</p> <p>Identified high bounce rate for website; dynamic features may not have been accessible to all users; design for different platforms and browsers.</p> <p>Promotional campaign led to increased website usage; assisted with website redesign and maintenance efforts.</p> <p>Technically possible where there was no access to web server data.</p> <p>Basic reports did not reveal any real insights into website usage; not all the data were applicable to website redesign; did not inform changes to homepage; did not provide answers to why users followed certain paths through the website; impossible to analyse navigation paths for all pages, therefore, analysis guided by library staff experience of pages users might have difficulties with.</p> <p>Interpreting data into website redesign proved challenging; contradictory information on website usage; information on user segments of interest to library staff were not available; studying reports was time consuming; deeper analysis required more time and effort.</p> <p>Google Analytics terms and conditions of use need periodic checking to ensure they are acceptable; checking off-site links and media files involved manually inserting code for each link; data only gathered for analysis once code was inserted on a webpage; difficult to tag all pages on a large website.</p> <p>Available data were targeted at organisations where marketing was the primary agenda.</p>	Arendt & Wagner 2010; Fang 2007; Li 1999; Memmott & deVries 2010; Waller 2009

Method	Advantage/disadvantage	Reference
<p>Web server log file analysis</p>	<p>Provided quantitative data, represented activity of large numbers of library website users; non-invasive collection process.</p> <p>Broad website usage data; browsers used by visitors; popular/un-popular pages; search phrases and engines used to find website. Access to quick links studied and changes implemented.</p> <p>Evidence of webpage usage and library staff services to customers; demonstrated improved access to resources.</p> <p>Highlighted issues with interface; informed website design including information architecture, link placement and page prominence; provided a means of measuring web-conversion rates for banner advertising.</p> <p>Server logs recorded machine to machine activity; data can be unreliable; logs were complex; log files were very large; web spider activity inflated counts; cached pages not recorded; did not identify visitor groups; log file formats not always standards compliant (common log file format).</p> <p>Did not contain information about users: their intentions, goals or whether they achieved the purpose of their visit.</p> <p>Limitations in data mean it was only useful as evidence of baseline usage.</p> <p>Impossible to identify multiple clicks on the same link or click through to another page prior to a page loading in the browser window; impossible to identify which page a link was accessed from without implementing server-side script.</p> <p>Web pages not on library/university web server were not included in the logs.</p> <p>Training required to understand data; analysis was time consuming; decision on which pages to analyse; website architecture and design influence statistical counts.</p>	<p>Asunka <i>et al.</i> 2009; Black 2009; Felker &amp; Chung 2005; Ghaphery 2005; Harley &amp; Henke 2007; Hightower, Sih &amp; Tilghman 1998; Thompson 2003; Waller 2009; Welch 2005a; Whang 2007; Xue 2004</p>

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 Appendix C. **LIST OF STUDY UNIVERSITIES**


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## List of 130 UK universities

1. Aberdeen, University of	66. University of London Institute of Psychiatry
2. Abertay, University of	67. The Royal Veterinary College
3. Anglia Ruskin University [Chelmsford and Cambridge]	68. The Royal College of Music [London]
4. Aston University	69. University of London School of Advanced Studies
5. Bath, University of	70. University of London St. George's Hospital Medical School [London SW17]
6. Birmingham, University of	71. London Business School
7. Bolton, University of	72. London School of Economics and Political Science
8. Bournemouth University	73. School of Pharmacy [London]
9. Bradford, University of	74. London School of Hygiene and Tropical Medicine
10. Brighton, University of	75. University of London School of Oriental and African Studies
11. Bristol, University of	76. University of London School of Slavonic and East European Studies
12. Brunel University	77. University of the Arts London [Chelsea College, London College of Fashion, Camberwell College, Central St.Martins College]
13. Buckingham, University of	78. London Metropolitan University
14. Cambridge, University of	79. London South Bank University
15. Canterbury Christ Church University	80. Loughborough University
16. Birmingham City University	81. University of Luton (BEDFORDSHIRE)
17. University of Cumbria	82. Manchester Metropolitan University
18. Central Lancashire University of	83. Manchester, University of
19. Chester, University of	84. Middlesex University
20. City University, London	85. Napier University
21. Coventry University	86. Newcastle University
22. Cranfield University	87. Northampton, University of
23. Derby, University of	88. Northumbria University
24. Dundee, University of	89. Nottingham Trent University
25. Durham University	90. Nottingham, University of
26. East Anglia, University of	91. Open University
27. University of East London	92. Oxford Brookes University
28. Edinburgh, University of	93. Oxford, University of
29. Essex, University of	94. Paisley, University of
30. Exeter, University of	95. Plymouth, University of
31. Glamorgan, University of	96. Portsmouth, University of
32. Glasgow Caledonian University	97. Queen's University Belfast
33. Glasgow, University of	98. Reading, University of
34. Gloucestershire, University of	99. Robert Gordon University

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35. Greenwich, University of	100. Roehampton University
36. Heriot-Watt University	101. St Andrews, University of
37. Heriot Watt University [Borders Campus, Galashiels [formerly Scottish College of Textiles]	102. Salford, University of
38. Hertfordshire, University of	103. Sheffield Hallam University
39. Huddersfield, University of	104. Sheffield, University of
40. Hull, University of	105. Southampton Solent University
41. UHI Millennium Institute [Inverness]	106. Southampton, University of
42. Keele University	107. Staffordshire University
43. Kent, University of	108. Stirling, University of
44. Kingston University	109. Strathclyde, University of
45. Lancaster University	110. Sunderland, University of
46. Leeds Metropolitan University	111. Surrey, University of
47. Leeds, University of	112. Sussex, University of
48. Leicester, University of	113. Teesside, University of
49. De Montfort University [Leicester]	114. Thames Valley University
50. Lincoln, University of	115. Ulster, University of
51. Liverpool Hope University	116. Wales, University of
52. Liverpool John Moores University	117. University of Wales Aberystwyth
53. Liverpool, University of	118. University of Wales Bangor
54. University of London Birkbeck College	119. Cardiff University
55. University of London Goldsmiths College	120. University of Wales Lampeter
56. University of London Heythrop College	121. University of Wales, Newport
57. University of London Imperial College of Science, Technology and Medicine	122. University of Wales Swansea
58. University of London King's College	123. University of Wales Institute [Cardiff]
59. Courtauld Institute of Art [London]	124. Warwick, University of
60. University of London Queen Mary	125. University of the West of England [Bristol]
61. University of London Royal Holloway	126. Westminster, University of
62. University of London University College	127. Winchester, University of
63. Institute of Child Health [London]	128. Wolverhampton, University of
64. University of London Institute of Cancer Research	129. Worcester, University of
65. University of London Institute of Education	130. York, University of

#### East Midlands University Association (EMUA) member institutions

1. De Montfort University
2. University of Derby
3. University of Leicester
4. University of Lincoln
5. Loughborough University
6. University of Northampton
7. Nottingham Trent University
8. University of Nottingham

\*Bishop Grosseteste University College Lincoln and The Open University removed from the sample



Appendix D. **HOMEPAGE CONTENT ANALYSIS**

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*Introduction*

The library homepage features analysed in this study were, in the main, derived from the literature. Additional elements were added, or updated, to reflect the current development of library webpages. For ease and accuracy in the recording process for each website, a checklist of categories and elements was created.

The first round of data gathering highlighted difficulties in distinguishing between university and library webpage elements. Initial problems encountered were amplified as data gathering continued. It became apparent that there were issues to be overcome with an approach that either included or excluded page elements provided in the university template. For example, a search box may be provided by the university within the website template. With this search facility it may only be possible to search the entirety of the university website. As it is within the university web template a library may have no option to provide an alternative or additional search box for searching its own website independently. Ultimately, the decision over which elements to include in the study were overcome by devising guidelines to ensure consistency in the recording process.

*Initial criteria for library homepage comparison and recording*

In the first round of testing the checklist, the following guidelines were applied:

<b>Guideline 1: Anything appearing within the browser window for the URL in question will be recorded as part of the library website.</b>	
<b>Rationale</b>	<b>Test results</b>
<p>Visitors to a library homepage may not distinguish between university webpage elements and library webpage elements. This may particularly apply where a visitor to the library website had not visited any other university webpages. In this case they would not be aware of the standardisation applied across all sites within the university web presence.</p> <p>A library might exclude some features from their own webpages to prevent duplication of elements appearing in the university template.</p> <p>This delimitation will simplify the recording process.</p>	<p>This guideline proved difficult to maintain in the recording process. Features provided within a university template did not always deliver the expected results. For example, a search facility would return results from departments at the institution, a website map link would provide a map for the whole of the university website, and so on.</p> <p>Library website users might reasonably expect options on a library homepage to be dedicated to the library and its services.</p>
<b>Guideline implemented: NO</b>	

*Table 1: Guideline 1*

<b>Guideline 2: Only elements that appear on the library homepage will be recorded.</b>	
<b>Rationale</b>	<b>Test results</b>
<p>Any elements introduced in sub-level pages will be excluded from the analysis. For example: Address and Contact details needed to be visible on the library homepage to be counted.</p>	<p>This was a straight forward guideline which was easy to adhere to.</p>
<b>Guideline implemented: YES</b>	

*Table 2: Guideline 2*

<b>Guideline 3: The width of a search box will be recorded by counting the number of characters that can be input into it while still remaining visible on screen.</b>	
<b>Rationale</b>	<b>Test results</b>
<p>Nielsen (2002) recommends a search box width of 27 characters. This will be used as a measure of the utility of a search box in delivering its purpose. Libraries adherence to this will be revealed.</p> <p>The letter 'h' will be used to make this count.</p>	<p>This was an easy to follow guideline.</p>
<b>Guideline implemented: YES</b>	

*Table 3: Guideline 3*

<b>Guideline 4: A scoped search is defined as one which allows the enquirer to select one of a range of resources to search across.</b>	
<b>Rationale</b>	<b>Test results</b>
<p>A scoped search provides the enquirer with a variety of options to search, e.g., the library website, university website, Google, or the library catalogue.</p> <p>Although a number of search options are available with a scoped search facility, only one can be selected per search instance.</p>	<p>This was a straight forward guideline which was easy to adhere to.</p>
<b>Guideline implemented: YES</b>	

Table 4: Guideline 4

<b>Guideline 5: A federated search is one which facilitates the selection of a number of content areas to interrogate within the same search instance.</b>	
<b>Rationale</b>	<b>Test results</b>
<p>To be recorded as a federated search, enquirers must have the option to select more than one resource to search across in any single search enquiry.</p>	<p>This was an easy guideline to implement.</p>
<b>Guideline implemented: YES</b>	

Table 5: Guideline 5

<b>Guideline 6: Page length is defined by referring to the browser print preview feature.</b>	
<b>Rationale</b>	<b>Test results</b>
<p>This will provide data on page length – whether library websites can be viewed without the requirement to scroll down to see content.</p> <p>The browser print preview feature is a convenient way to judge homepage length.</p> <p>To ensure consistency in recording this element the text size displayed by the browser for each homepage needs to be set to 'Normal'.</p>	<p>Print preview as a measure of page length proved to be inaccurate as some websites made use of a print style sheet. This technical solution is used to strip out content that may not be required on a printed version of the webpage. Content typically removed by this method included the page header, menus and images. The result of the use of a print style sheet was that the print preview page length appeared reduced when compared with the page viewed through the browser window.</p> <p>To overcome this, a screen grab of each website will be taken. Where the website is not visible in one screen grab, additional screen captures will be recorded as additional pages.</p>
<b>Guideline implemented: YES – with the additional of a comparative measure.</b>	

Table 6: Guideline 6

<b>Guideline 7: A university or library logo must constitute a design feature on the page.</b>	
<b>Rationale</b>	<b>Test results</b>
The criteria for determining whether the university or library has a logo is that an attempt has been made to create a visual or textual identifier which extends beyond the mere presentation of the university or library name in a commonly used font or layout.	In terms of the university, the presence of a logo was relatively straightforward to judge.  Deciding on whether the presentation of the library name as a textual element could be regarded as a visual badge or identifier was not always as easy to judge.
<b>Guideline implemented: YES</b>	

Table 7: Guideline 7

<b>Guideline 8: A colour count of colours introduced to the design of the page to add visual appeal.</b>	
<b>Rationale</b>	<b>Test results</b>
The colour count will provide a rough measure of visual appeal. It will include menu and page links (un-visited, hover and visited), but exclude graphical elements (images, logos and illustrations).	Colours were relatively easy to count; the main problem arose when multiple shades of a single colour were adopted.
<b>Guideline implemented: YES</b>	

Table 8: Guideline 8

<b>Guideline 9: Establish a total count of the textual content of the library homepage.</b>	
<b>Rationale</b>	<b>Test results</b>
This will establish how text heavy each homepage is.  Recording the word count for each homepage will be accomplished by copying and pasting page contents into word processing software.	Copying and pasting to establish a word count for each homepage proved an inaccurate measure for a number of reasons.  Where drop-down menus were used, all menu items were included in the word count even though they were not immediately visible on the page. These additional menu links were only visible when the mouse was hovered over top level menus  Accessibility links for screen readers (skip navigation, and so on) were also included in the copy and paste word count.  Both of these factors resulted in a text count that did not represent the screen view of the page.  A true word count of text visible in the browser window will be taken by removing any additional text captured in selecting all the text from the homepage.
<b>Guideline implemented: YES – with a revised approach to the removal of certain text.</b>	

Table 9: Guideline 9

<b>Guideline 10: Maintain consistent recording conditions across all library websites.</b>	
<b>Rationale</b>	<b>Test results</b>
Inconsistency in the display of pages across browsers and PCs will be minimised by recording all sites on the same PC with the same browser setup.	This guideline was easy to adopt.
<b>Guideline implemented: YES</b>	

Table 10: Guideline 10

<b>Guideline 11: Adhere to Nielsen's suggested terminology as closely as possible.</b>	
<b>Rationale</b>	<b>Test results</b>
Terms like 'help', 'about' and 'FAQ' will be matched as closely as possible.  Diversion from these terms will be noted.	This was not always easy to determine by referring only to the homepage. Where there was doubts about the destination of a link on the homepage the online website was visited and the destination of the link investigated.
<b>Guideline implemented: YES</b>	

Table 11: Guideline 11

<b>Guideline 12: A broad definition of the term 'advertising' will be applied to items present on the library homepage.</b>	
<b>Rationale</b>	<b>Test results</b>
Detail of the types of resources and services advertised on the library homepage will be gained by taking an inclusive view of advertising.	This guideline was easy to implement. Taking such a broad view proved beneficial and allowed for a wide range of resources and services to be captured.
<b>Guideline implemented: YES</b>	

Table 12: Guideline 12

<b>Guideline 13: Record additional notes in the fields provided.</b>	
<b>Rationale</b>	<b>Test results</b>
The notes fields on the checklist will be used to qualify answers given.  It will also provide space for additional notes about novel features or elements on these homepages.	The notes fields proved a useful addition to the checklist.  During the test phase these fields were used to record any additions, removals or adjustments required to the recording instrument.
<b>Guideline implemented: YES</b>	

Table 13: Guideline 13

*Results of checklist pilot test*

The checklist pilot test brought to light a few additional issues in the recording process. This resulted in the creation of two further guidelines for completing the checklist for all UK university library website homepages.

<b>Guideline 14: A university wide search box will be excluded from the study.</b>	
<b>Rationale</b>	<b>Test results</b>
Where a university search box is provided, search results might not be that useful to library website visitors.	The results returned for searches made with a university search facility provided matches to pages outside the library webpages.
<b>Guideline implemented: YES</b>	

*Table 14: Guideline 14*

<b>Guideline 15: Where multiple search boxes are provided, only a search box capable of exclusively searching across the library website will be recorded.</b>	
<b>Rationale</b>	<b>Test results</b>
Some homepages included both a university and library search box. This forced the researcher to decide which search box should be recorded.  Some sites also featured a search box for their library catalogue on their homepage. But, is this a feature requiring in-depth data for this study?	As the focus of this study is the library website, and with consideration for the issues previously identified in the university search feature, only the library box will be recorded in any detail.  Details of library catalogue search box(es) were excluded from the final checklist. This decision was taken as the main focus of the study was to capture the presence of features on the library homepage. The particulars of the catalogue search were not regarded as important as features designed to assist visitors in navigating the library website.  Recording preference will be given to a library website search box; the presence of a university search box will be recorded, but not detailed.
<b>Guideline implemented: YES</b>	

*Table 15: Guideline 15*

**Homepage checklist**

University Library name:

University URL:

Library URL:

Characteristics	Element record		Notes
<b>Homepage - University</b>			
Direct link to library	Yes – 51 (39%)	No – 79 (61%)	
Access via quick link/dropdown menu	Yes – 31 (24%)	No – 99 (76%)	
Access via search	Yes – 122 (94%)	No – 8 (6%)	
Access via website index	Yes – 78 (60%)	No – 52 (40%)	
Access via student pages	Yes – 81 (62%)	No – 49 (38%)	
<b>Homepage - library</b>			
<b>Search</b>			
Search options provided	Yes – 117 (90%)	No – 13 (10%)	
Link to search	Yes – 37 (28%)	No – 93 (72%)	
Link to search library catalogue	Yes – 126 (97%)	No – 4 (3%)	
Link to search electronic resources or database	Yes – 107 (82%)	No – 23 (18%)	
Number of separate search boxes	None – 33 (25%) One – 74 (57%) Two – 21 (16%) Three – 2 (2%)		
Library website search box	Yes – 44 (34%)	No – 86 (66%)	
Width of search box (characters – use letter ‘h’)	< 25 – 37 (84%) 25 to 29 – 5 (11%) 30 or more – 2 (5%)		
Search box placement	Upper left – 6 (14%) Upper centre – 1 (2) Upper right – 28 (64%) Middle – 5 (11%) Lower – 4 (9%)		
Search box has descriptor within it	Yes – 18 (41%)	No – 26 (59%)	
Descriptor used	Search section or area - 6 Search – 5 Enter terms – 4 Branded search (Google) – 2 Scope (quick search) - 1		
Search button	Yes – 43 (98%)	No – 1 (2%)	
Button label	Search – 18 (41%) Find – 0 Go – 19 (43%) Magnifying glass – 0 Other – 4 (9%) None – 1 (2%)		
Simple/scoped (limit to selected areas)	Simple – 33 (75%)	Scoped – 11 (25%)	
Federated	Yes – 0	No – 44 (100%)	
Search box searches the catalogue	Yes – 5 (11%)	No – 39 (89%)	
Search box searches electronic resources	Yes – 2 (5%)	No – 42 (96%)	
Search box searches university website	Yes – 35 (80%)	No – 9 (20%)	
Search box searches the Web (e.g., Google)	Yes – 2 (5%)	No – 42 (95%)	

## Homepage content analysis

Characteristics	Element record		Notes
<b>Navigation</b>			
Website index/A-Z index	Yes – 39 (30%)	No – 91 (70%)	
Sitemap link	Yes – 28 (22%)	No – 102 (78%)	
Library navigation bar location	Top – 30 (23%) Centre – 19 (15%) Bottom – 0 Left side – 76 (58%) Right side – 3 (2%) Other – 2 (2%) None – 0		
Quick link bar/section	Yes – 47 (36%)	No 83 (64%)	
Quick links drop down	Yes – 7 (5%)	No – 123 (95%)	
Link to Intranet/portal/VLE	Yes – 41 (32%)	No – 89 (68%)	
Library footer navigation links	Yes – 7 (5%)	No – 123 (95%)	
Breadcrumb trail	Yes – 73 (56%)	No – 57 (44%)	
Link colour, unvisited	No links on page – 10 (8%) Of 120 libraries: Blue – 90 (75%) Black – 10 (8%) Red – 9 (8%)		
Link colour, visited	No links on page – 10 (8%) Of 120 libraries Blue – 60 (50%) Red – 14 (12%) Black – 12 (10%) Purple – 9 (8%)		
Link colour different for visited and unvisited	Of 120 libraries Yes – 49 (41%) No – 71 (59%)		
Link colour, hover	No links on page – 10 (8%) Of 120 libraries Red – 27 (23%) Black – 15 (13%) Blue – 10 (8%)		
Link underlining	Yes – 104 (87%)	No – 16 (13%)	
Link ALT text	Yes – 7 (6%) No – 61 (51%) Some – 52 (43%)		
Link count (entire page in browser)	Total – 5570 Average – 42.85		
Page length - too much text – scrolling (set text size to Medium – Tools, View, Text size) Number of pages in Print Preview (File>Print Preview)	One – 95 (73%) Two – 26 (20%) Three – 8 (6%) Four – 1 (1%)		
Number of screen grabs	One – 95 (73%) Two – 31 (24%) Three – 4 (3%)		



Characteristics	Element record		Notes
<b>Design/typography</b>			
Design unique/distinct from other library pages	Yes – 32 (25%)	No – 98 (75%)	
Liquid layout	Yes – 63 (48%)	No – 67 (52%)	
University logo	Yes – 118 (91%)	No – 12 (9%)	
Library logo	Yes – 10 (8%)	No – 120 (92%)	
Library logo placement	Upper right – 3 (30%) Upper centre – 1 (10%) Upper left – 6 (60%) Other – 0		
Banner	University – 43 (33%) Library – 6 (5%) Combined – 81 (62%)		
Graphics (Images)	Yes – 120 (92%)	No – 10 (8%)	
Image ALT text	Yes – 75 (58%) No – 20 (15%) Some – 27 (21%)		
Wallpaper (Background image)	Yes – 1 (1%)	No – 129 (99%)	
Background colour	White – 117 (90%) Multi – 5 (4%) Dark – 0 Other – 8 (6%)		
Body text colour	Black – 88 (68%) Dark – 17 (13%) White – 0 Other – 13 (10%) No body text – 12 (9%)		
Body text size frozen (change in View>Text Size)	Yes – 16 (12%)	No – 114 (88%)	
Number of colours (exclude images, include black and white)	0-5 – 45 (35%) 6-10 – 74 (57%) 11-15 – 9 (7%) >15 – 2 (2%)		
Word count (copy and paste into a Word document)	Total – 37101 Average – 285.40		
Text only website link	Yes – 36 (28%)	No – 94 (72%)	

Homepage content analysis

Characteristics	Element record		Notes
<b>Content/general features</b>			
Address	Yes – 62 (48%)	No – 68 (52%)	
Contact details	Yes – 55 (42%)	No – 75 (58%)	
Contact us link	Yes – 105 (81%)	No – 25 (19%)	
About	Yes – 64 (49%)	No – 66 (51%)	
Link for webmaster	Yes – 24 (18%)	No – 106 (82%)	
Feedback	Yes – 44 (34%)	No – 86 (66%)	
FAQ (How do I?)	Yes – 35 (27%)	No – 95 (73%)	
Freshness date/currency	Yes – 47 (36%)	No – 83 (64%)	
News/ announcements	Yes – 97 (75%)	No – 33 (25%)	
Number of news items	Average – 4		
Time stamped news item	Yes – 21 (26%)	No – 61 (74%)	
Characteristics of news items	Title only – 39 (46%) Title and leader – 31 (37%) Title and full news story – 25 (30%)		
Spotlight/special feature	Yes – 21 (16%)	No – 109 (84%)	
Research support	Yes – 45 (35%)	No – 85 (65%)	
Help	Yes – 50 (38%)	No – 80 (62%)	
Labels/terms	Catalogue name used – 9 (7%) Catalogue – 122 (94%) Find book – 0 Other – 3 (2%) Not listed – 4 (3%)  Database name used – 13 (10%) Database – 39 (30%) Database A-Z List – 2 (2%) Other – 50 (38%) Not listed – 32 (25%)		
<b>Technology/Interactivity</b>			
Video	Yes – 11 (8%)	No – 119 (92%)	
Audio	Yes – 5 (4%)	No – 125 (96%)	
Blog	Yes – 21 (16%)	No – 109 (84%)	
Podcast	Yes – 9 (7%)	No – 121 (93%)	
Vodcast	Yes – 5 (4%)	No – 125 (96%)	
RSS feed	Yes – 25 (19%)	No – 105 (81%)	
Wiki	Yes – 0	No – 130 (100%)	
Customisation/personalisation (sign in)	Yes – 35 (27%)	No – 95 (73%)	
Animation on homepage	Yes – 12 (9%)	No – 118 (91%)	
Multimedia	Yes – 1 (1%)	No – 129 (99%)	
Other	45 (35%)		
<b>Strategy/ Policy</b>			
Mission/ vision/goal	Yes – 14 (11%)	No – 116 (89%)	
Privacy policy/legal information	Yes – 75 (58%)	No – 55 (42%)	
Accessibility link	Yes – 59 (45%)	No – 71 (55%)	
<b>Advertising</b>			
Advertising	Yes – 98 (75%)	No – 71 (55%)	

## Appendix E. **PILOT SURVEY RESULTS**

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### *Executive summary*

This pilot survey set out to establish management and maintenance practices within the East Midlands University Association (EMUA) libraries. This was achieved through the delivery of an online questionnaire to library web maintainers. Themes explored in the questionnaire related to the management and maintenance of library websites; and the ways in which sites are evaluated to determine user experience and activity on those sites. One of the key themes addressed by the questionnaire was this latter point, how were libraries currently using web metric data, and web analytics tools and principles to gather, analyse and amend their sites to reflect visitor activity? The key findings of the questionnaire, as reported by EMUA libraries, are detailed here.

University policy had a role to play in framing library practice in relation to library websites. Although it was seen to have a role, direct intervention by universities may be minimal. Some of the libraries in this group had an involvement in steering university policy by their presence on the university web group.

The strategic direction for library websites was provided through website aims and objectives; and policy and guidance documents. This direction was, in the main, delivered by the library web group.

Libraries were proactive in their approach to monitoring their website and in gathering user feedback. Visitor activity on the website was recorded through a combination of web server log files and web analytic services (Google Analytics). Where user studies were not undertaken, lack of time and limited access to the web server proved to be the determining factors.

In respect of metric data and its analysis, libraries were examining and reporting on the data they gathered. For some libraries this was an established practice, for others it was a relatively new area of exploration. This form of intelligence was consulted when making

change to library websites. It was clear that there were some issues with the data itself, and how libraries were able to implement, analyse and interpret it.

One respondent commented that the sharing of practice across the sector would be of benefit. This study brings into view some of the current issues and complexities libraries face in managing and maintaining their websites.

### *1.0 Introduction*

To begin to establish UK university libraries current practice in managing and maintaining their website a pilot study was undertaken as a precursor to a national survey. An online questionnaire was used to gather views on the topic from the selected pilot group, the East Midlands Universities Association (EMUA) libraries. The questionnaire explored a number of themes including website management, monitoring activities, and the use of web metrics and web analytics. These themes were designed to provide insight into different approaches to website management within the framework of library strategy and university policy.

The commitment libraries made to improving their website for visitors was apparent in the ways in which the website was changed in direct response to user feedback and their activity on the website. The methods libraries adopted for discovering how visitors interacted with their website, and their experiences of using it, were examined through questions on usability studies and metric analysis. Questions relating to website management and strategy were themed around management practice and the presence of strategy and policy documents.

Through this exploratory study, and the national survey, evidence was gathered in relation to current activity for website optimisation. Examples of a range of practices were uncovered which indicated good practice in this area.

### *1.1 Aims and objectives*

The aim of the pilot survey was to discover the approaches UK university libraries adopted for maintaining and developing their websites.

The objectives of this survey were twofold:

1. to discover levels of awareness and use of web metrics in UK university libraries;  
and
2. to establish the role organisational strategy played in framing management and maintenance activities.

### *2.0 Methods*

The pilot group was selected because they comprised a discrete group of libraries with an association to each other through EMUA. They were also in relatively close proximity and were, therefore, conveniently situated for follow-up interviews. Of the ten member institutes of EMUA, eight were included in the sample. The remaining institutions were excluded on the grounds that one did not fit with the study group as they were not a higher education institution, and one was a regional centre for a national university.

An individual at each library was selected for contact via email. Selection was made on the basis of the individual's role in the library website. Where possible, this was believed to be someone with a senior role in relation to the website. In some instances the introductory email was forwarded on to a more appropriate colleague. A follow-up telephone call was made to those individuals who had not submitted a response to the questionnaire. In total, six completed questionnaires were received; this represented a response rate of 75%.

### 3.0 Findings

Findings were presented under the headings used in the questionnaire. Figures in brackets indicated the number of responses in support of the statement.

#### 3.1 Demographics

Respondents to the survey were: Web Developers (two), a Technical Services Manager (one), Website Administrator (one), in a role that equates to a Web Master (one) or a Content Provider (one).

#### 3.2 Website management

Although this survey represents a small sample of UK university libraries it illustrated the impact university policy had on university library websites (five). There was also evidence that some libraries had an input into university policy through their presence on the university web group/committee (three). Some universities provided a website template for departments to follow (three). Its use was either mandatory (one), encouraged (one) or optional (one). One respondent reported that their university did not have a web group/committee.

Libraries had methods in place for determining the strategic direction of their website (four) which were supported by website aims and objectives (four). In some instances the management and maintenance of the website was steered by guidelines (three), while others did not have a formal document in place (three) (Figure 3-1). One library reported that “*Digital library strategy is being developed to take into account all library web developments, not just the library website.*” This was a strong indicator that in some instances overall strategy was inclusive of web strategy.

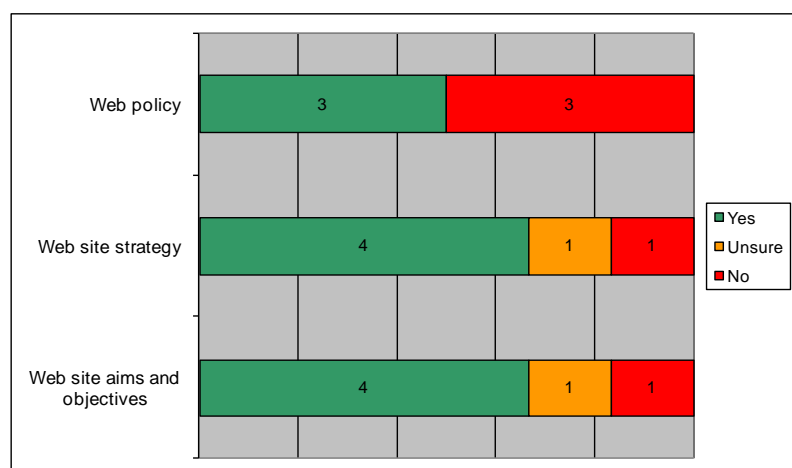


Figure 3-1: Web strategy

Websites were managed by a group/committee (four) consisting of between four to nine individuals. One website was managed by an individual. Librarians (four) and IT (three) staff were the most common groups represented at committee level. Skills held by those working on library websites were reported as being self-taught (five), or having the following qualification: library (six), computer science (four) or design (one). Publishing or marketing professions were not part of the skills mix neither were statistician. However, one respondent noted a colleague's numerical skills were valuable when carrying out statistical analysis. Another pointed out that a member of staff with a multimedia qualification worked on the library website.

All the libraries in this survey had full control over the maintenance of their website (six). Furthermore, the majority had control over website content (five) and development (five). Design (three) and finance (two) were the two areas where libraries reported having some control. One library had no control over a budget for their website (Figure 3-2).

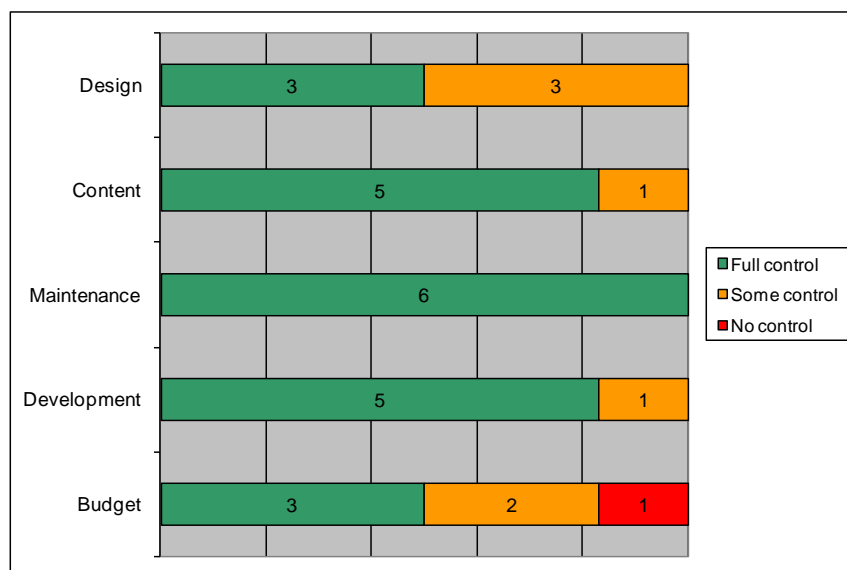


Figure 3-2: Areas of website control

### 3.3 Website monitoring

Website monitoring activities were undertaken by four respondents' libraries. The views of website users at these libraries were actively canvassed through web metrics (four), surveys (three), focus groups (three), task setting exercises (two) and anecdotal evidence (two) (Figure 3-3). Respondents indicated that the information gathered from their users informed change to their website (four). Adaptations were made at all levels from website structure (two), design (four) and navigational elements (four). Individual page elements such as page design (four), textual content (three) and semantic labels (four) were also amended. Interactive features were also influenced by user opinions of the website (two). Technical aspects, such as website code, were not amended in response to feedback (Figure 3-4). Two library were not engage in user studies due to lack of time (one) or because they had limited access to the web server (two).



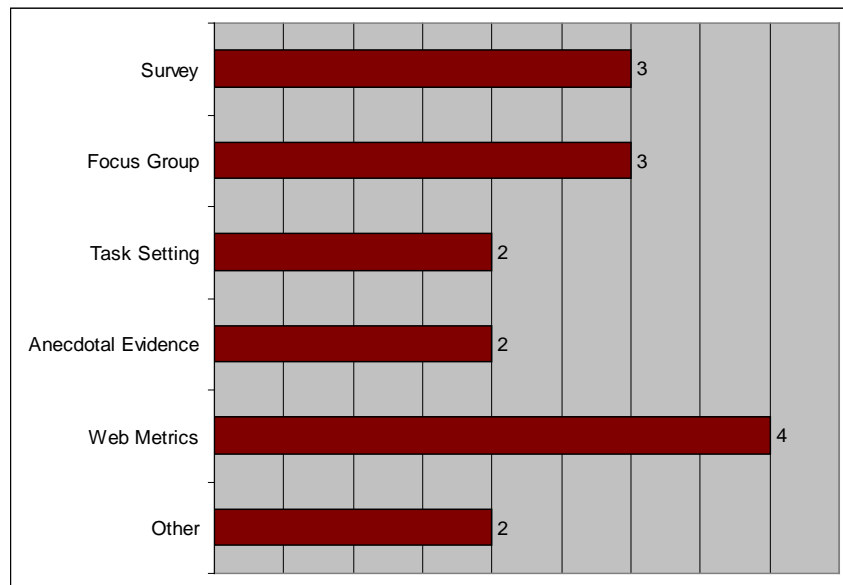


Figure 3-3: User study methods

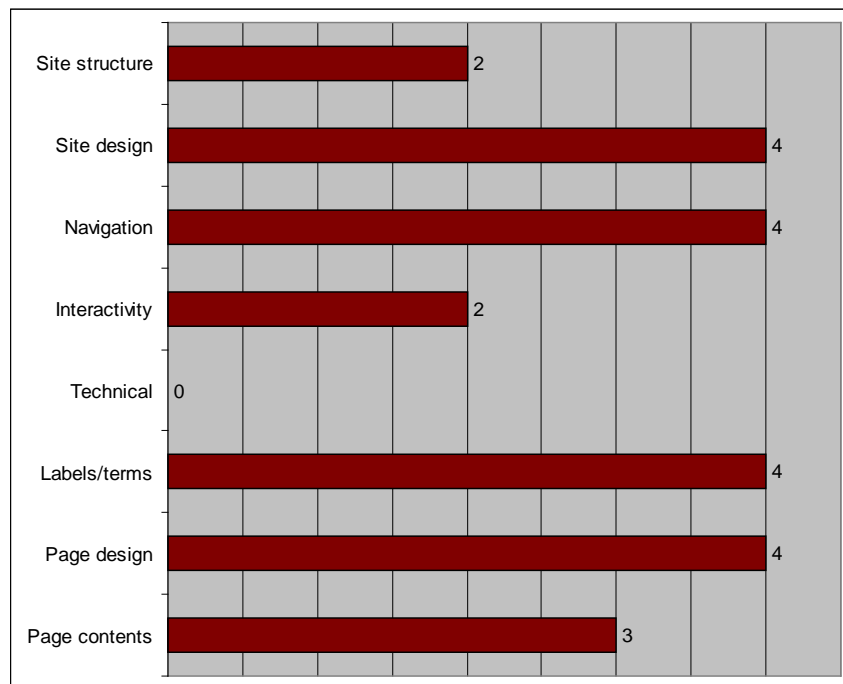


Figure 3-4: Website elements changed in response to user feedback

### 3.3.1 Web metrics and web analytics

Web metric data were collected by four respondents and two methods for data gathering were in evidence:

- web metrics – server log files (four); and
- web analytics – free analytic tools (four).

In some libraries, this form of data collection was an established practice for over two years (three). In one library it was a relatively new method which had been used for less than a year. Data analysis and reporting practices varied, in some cases raw data were examined (three), trends were followed (three), and reports were produced (three). One library carried out in-depth analysis. However, none reported that they were monitoring key performance indicators. All libraries created their own reports which were targeted at specific teams (two) or a general report was created for management (one) (Figure 3-5).

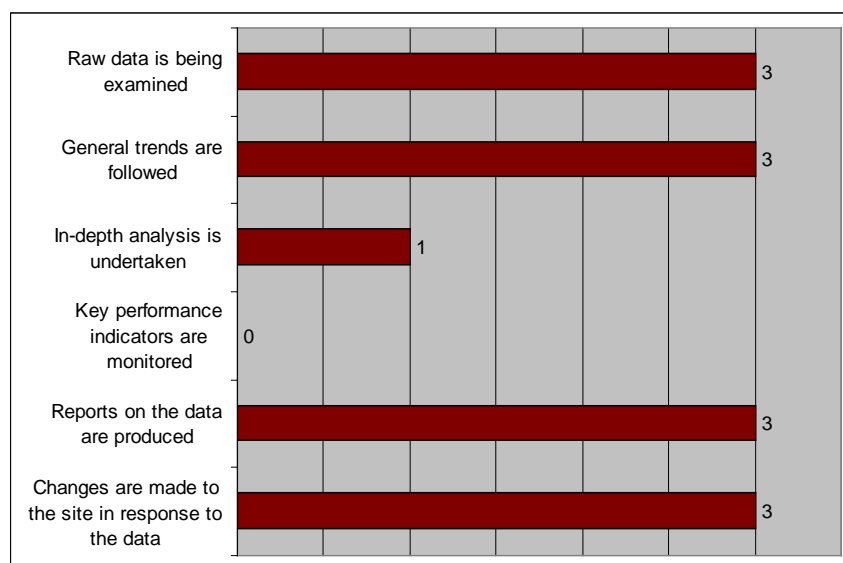


Figure 3-5: Data analysis and use

For analysis, the responses in the following section were grouped into ‘strongly agree/agree’ and ‘disagree/strongly disagree’. This approach was adopted as it provided clarity to the varied views on the benefits and drawbacks of web metrics/analytics expressed by this small sample of libraries.

Considering the technical aspects of web analytics, libraries agreed that their solution was easy to implement (three). However, some problems were experienced with configuration (two) and ensuring pages were correctly tagged (three). The accuracy of web metric data was of concern (three), but two libraries disagreed with the statement that data security was an issue. For understanding use of the website and gathering intelligence, it was felt that web analytics complemented other forms of data analysis (four). When considering the benefits of web analytics one respondent commented that *“The process itself is useful because it generates data that gets people talking about the web.”* There was no agreement on whether analytics helped libraries to understand the use of their website. However, data overload was believed to be a problem (three). When taking action on the data, it offered general guidance information (two), but it did not provide data on targets set for the website (two) (Figure 3-6). However, it suggested actionable data (two), although using these data for decision making was reported to be an issue (two). Views on whether staff had the necessary skills to make the most out of the available data were split, but having the time to analyse and interpret these data was an issue (three). Insufficient funds were available to enable the library to get the most out of the available data in two cases (Figure 3-7, Figure 3-8).

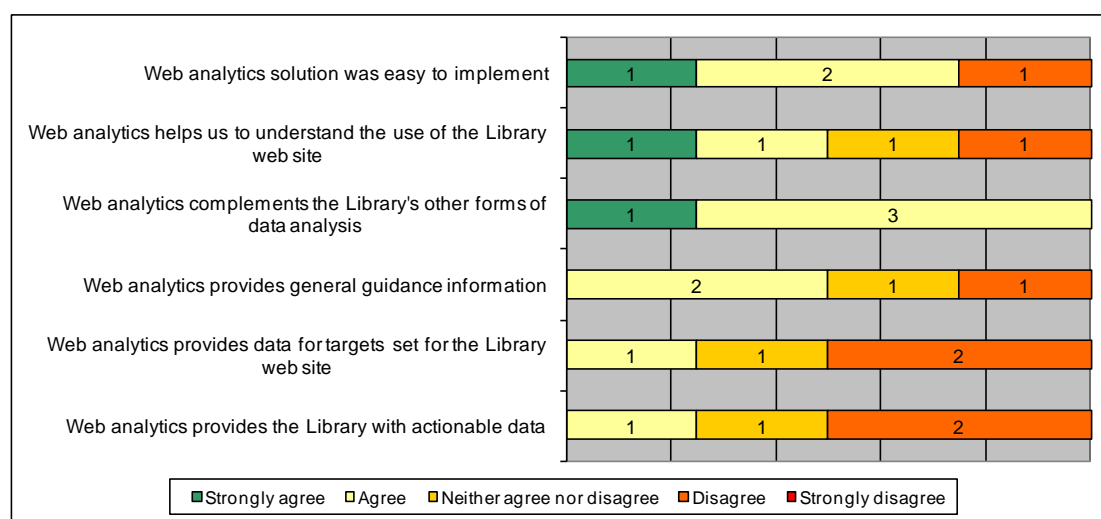


Figure 3-6: Potential benefits to web metrics

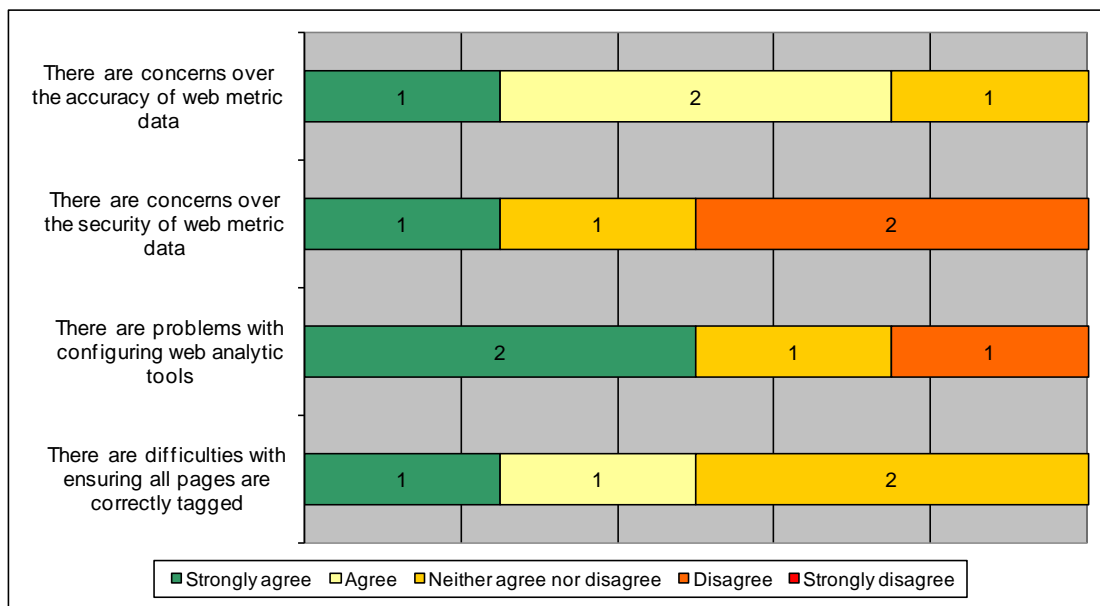


Figure 3-7: Potential drawbacks to web metrics

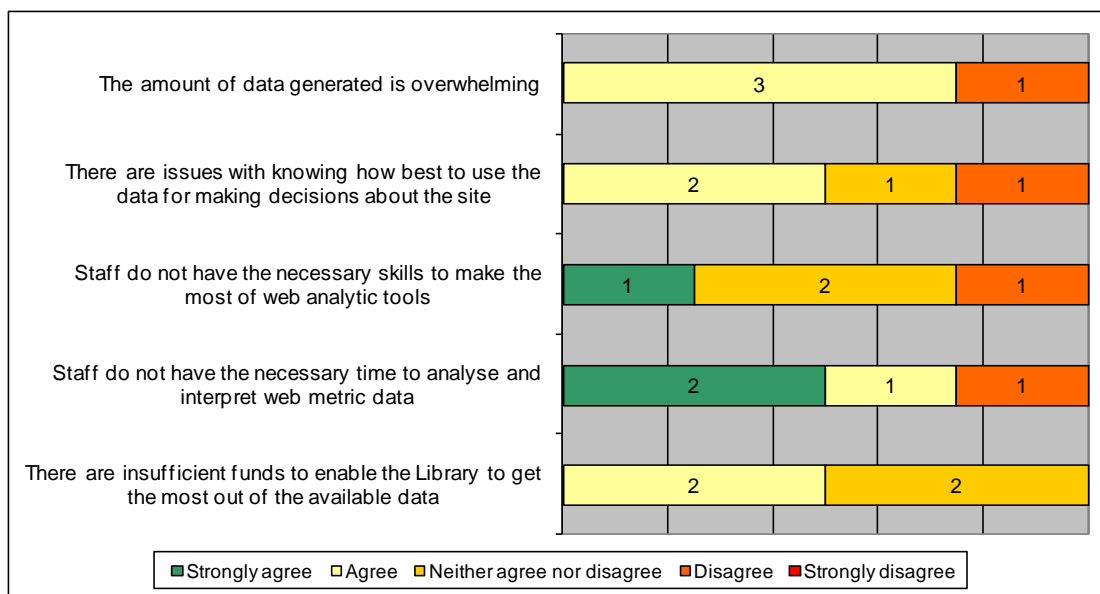


Figure 3-8: Potential drawbacks to web metrics

### 3.4 Free-text: key themes and concepts

Two methods were used to analyse free-text comments to the questionnaire. Firstly an overview of all comments was provided by the production of a word cloud. Secondly a more detailed analysis of the text was made and key themes extrapolated.

The production of a word cloud was accomplished by removing commonly used words from the text (e.g., and, on, in, what). The remaining words were then transformed into an image through the use of an online tool (Feinberg 2009). The pictorial presentation (Figure 3-9) brings to the fore a relatively small number of key words that encapsulate current thinking or priorities for respondents.



Figure 3-9: Free-text comments word cloud

A more systematic analysis of the free-text comments was achieved by looking for themes in responses across all comments. As the sample was small, it was believed to be appropriate to consider all free-text comments together. One recurring theme was that of the role the university played in respect of the library website. This was manifest as having input into banner placement, consideration of linkages in design or content, or in advice on adherence to external guidelines and standards.

### *3.4.1 University practice*

Comments around the influence of the university in the library website were mentioned fifteen times.

- links between the university and library website were highlighted;
- strict rules were in place to govern content and visual appearance;
- universities provided some guidelines – branding, adherence to W3C guidelines and on accessibility issues;
- one respondent suggested that universities could provide guidelines to support website activities;
- developments at the university had a direct effect on the library;
- university monitored the entire website; and
- the relationship between the library and university web decision makers was noted.

### *3.4.2 Library practice*

#### *3.4.2.1 Change management*

Comments around the ways in which libraries managed change were mentioned four times:

- the process of change within libraries was reflected in activities associated with website management and maintenance; and
- advancements in library web services influenced the library website.

#### *3.4.2.2 Website management and maintenance*

The ways in which libraries managed and maintained their websites were mentioned eleven times:

- currently revamping the website using surveys and face-to-face feedback;
- library staff advised colleagues who had differing web abilities;
- metric analysis was in the early stages for some;

- web metric analysis could act as a catalyst for wider discussions about the website;
- committees played a role in providing structure, resolving issues and considering reports; and
- strategy developed in other areas included the library website.

### 3.4.3 *Sector practice*

Only one comment on wider influence upon the library website was made:

- sharing practice across the sector would be beneficial.

### 3.5 *Discussion*

These results highlighted some potentially interesting developments in the management and maintenance of UK university library websites. The influence exerted by university policy over the library website cannot be discounted, although it was notable that libraries had a high degree of control over their own website. Professional staff were involved in the development of the library website, however, the professions of publishing, marketing and statistical analyst were under represented.

User feedback was gathered through a variety of means and was diverted into website development. Areas of influence were design and editorial; technical developments were not guided by user feedback. Web metrics and analytics were in use at the majority of the respondents' libraries. In one example the university undertook website monitoring activities. Data were being examined and reports were provided to library staff. These data complemented other data gathered, and although it could be actioned it did not provide evidence for targets set by the library. Two problem areas for library staff were: having the time to analyse the amount of data created and possessing the knowledge to put it to best use.

Libraries might be assisted in their use of web metric data if they examined key performance indicators, or if staff time were freed up from other duties. One respondent noted "*Our approach could be more structured*", this might also have been the case for

other institutions. There was scope for universities to provide greater support for the management and development of websites created by faculty and departments. This was highlighted by one respondent in their statement: *“It would be good if the University gave some guidance on best practice but until then it will be a case of learning as we do it.”* Another comment called for the sharing of experience at sector level, *“Evidence based practice is important in all aspects of library management and this includes the web pages.”*

Where monitoring of the library website did not occur, time and access to the web server were cited as limiting factors to conducting visitor analysis. One respondent’s university monitored the entire website on behalf of the institution. This provided the library with an indication of website activity in the form of 'hits' on the website. As the questionnaire was aimed at gathering information about libraries practice in this area, data relating to university wide initiatives were not gathered. There was, therefore, no way of estimating the detail of the metric data recorded by this respondent’s university or its value to the library in question. It might have been the case that library staff were not given access to the data relating to its website, or to any reports created.

One library was limited in their ability to make changes to their website as their university maintained tight control over the institutional web presence. The case for recording visitor activity on a website with a view to making changes in response to this increased awareness of visitor activity was diminished in this framework. One alternative, but potentially useful, area where it might be worthwhile gathering this data was in support of presentations to university managers requesting changes to the website at the higher level.

### 3.6 *Limitations*

The analysis here was based on the views of a small number of UK university libraries, therefore, generalisations to other institutions were not possible. Similarly, analysis of free-text comments demonstrated that the practice and experience of a single institution was elevated in the findings. Therefore, it must be concluded that these data were suggestive of current practices and concerns. It is also important to note that the majority



of respondents reported that they gathered and analysed web metric data. This sample may not be a true representation of UK university libraries and it cannot be assumed that this form of web study was conducted by the majority of UK university libraries.

### *3.7 Conclusions*

High levels of awareness and use of web metrics were demonstrated among respondents to this questionnaire. Greater appreciation of the benefits of the use of web analytic tools, and how to manage and target web analytic efforts more effectively, may benefit libraries across the sector. Strategic decisions were seen to influence library website management and maintenance. However, additional information was needed to identify areas where strategy was influential, and the levels at which this control was exerted. This included where metric data informed decision making, and how strategy was used to direct metric analysis.

It remained to be seen whether the national survey supported these pilot findings, or whether a different picture emerged.

#### *3.7.1 Key findings*

- Libraries were keen to maintain links between their website and that of their university.
- Libraries were thinking strategically about their website.
- Web analytics was viewed as complementing other forms of user studies.
- Libraries expressed some concerns over the amount and integrity of web metric data.
- Libraries required a greater understanding of web analytics before they were in a position to make informed decisions about their website.

### 3.7.2 *Implications for the national survey*

- Initial contact with the libraries in the national survey assisted in the process of identifying an appropriate individual to approach with a request to complete an online questionnaire. The individual targeted for inclusion in the study should ideally have a management or technical role in the library website.
- As with any questionnaire, achieving a suitable response rate was problematic. This situation was alleviated by enriching responses to the questionnaire with practitioner interviews.
- Pilot survey respondents were not asked to make any distinction between their use of data from server log files and that of web analytic tools. Therefore, the results could not be used to identify any differences in approaches to these two methods of data collection and analysis. Thus, it was not possible to draw any conclusions about:
  1. The various strengths and weaknesses in each method.
  2. Whether satisfaction with one method equated to satisfaction with another.
  3. Respondents had to decide on how best to answer the final sets of questions on web metrics/analytics with either log file analysis, web analytics, or a combination of both in mind.
  4. Having the potential to comment on both methods would provide respondents with the option to record their experience of both. Capturing views on each method separately would require that the final set of questions be duplicated. This would lead to an extension of its length and may cause the response rate to be reduced. The trade-off between general and specific information and survey length required careful consideration.
  5. The pilot questionnaire set out to gather general data for an overview of current practice in web library website management and maintenance. This included highlighting library strategy and the use of web metrics/analytics. Therefore, the level of detail in the information provided by respondents was acceptable.

6. Additional detail on the advantages and disadvantages of each method could be gathered at interview stage or in the more detailed case studies.

### *3.7.3 Suggestions for further research*

- University web policy was recognised as a potentially influential factor for library website management. This issue could be explored further.
- Investigations into university practice for website monitoring using web metrics or web analytics would provide valuable information relating to the framework within which library websites were managed and maintained.
- Research into any substantive differences in webpage characteristics (design, features and content) between websites where web analytics was used to monitor visitor activity and direct alterations to the website, and those where it was not would support the findings of this study.

***Bibliography***

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## Appendix F.      **COMPARISON OF QUESTIONNAIRE VERSIONS**

---

### *Introduction*

Library practitioners' feedback on the initial version of the library website maintenance and management questionnaire suggested that a revised version might be appropriate. As a result, the questionnaire was redesigned and pilot responses to this version were analysed and compared with the previous draft. This evaluation illustrated areas where data will be lost, and where new information will be gathered if a revised questionnaire was implemented. This evaluative comparison is presented in the form of three tables. The tables include a measure of the potential value of changing the data to be collected, the ways in which data loss might be mitigated, and the relevance of any new themes.

Broadly speaking the areas of loss and gain are summarised as, gains in the areas of background and strategy, set against the loss of fine detail. In essence, the final questionnaire gathered data as a snapshot of current practice, rather than asking for responses that indicated what an organisation may, or may not, be doing. This revised focus was achieved in two main ways: 1). By the addition, and removal, of questions; 2). by changing response scales. Broad information gains and losses are set out below:

### *Information losses*

- Detail in response to a number of questions was lost. This detail allowed for the recording of activities that were in the planning stage that had not been considered or would not be undertaken.
- Detail around the type of user studies adopted by libraries and which approach was used to inform a range of aspects to the website.

### *Information gains*

- The impact of institutional policy on library policy.
- Data on management and control of the library website.

### *Analysis of question reformatting*

The questionnaire set out to gather data from UK university libraries on their website management and maintenance activities. This information was used to describe the current setting for website management, and the ways in which libraries developed their website for visitors. To do this it was necessary to offer conclusive data on the institutional factors affecting library website management, the range of approaches to website management adopted, and the methods used for gathering visitor feedback and how this information was processed, evaluated and acted upon.

In an effort to ensure that questions and response types facilitated gathering the most appropriate data, the survey tool was subjected to an iterative process of design, testing and amendment. Acting on the feedback provided by library and web design practitioners, as well as web metric specialists was key to ensuring that the pilot version of the questionnaire was as close to an optimal design as possible.

The analysis of the two versions of the questionnaire that follow highlight the main areas where changes to questions and response options were made. The discussion on each change also took into account the type of analysis that was applied to response data.

### *Measurement scales*

The first version of the questionnaire made extensive use of the following scale: *Are doing, Planning to do, Considered, Have not considered, Will not be doing*. The revised version makes use of a much simpler measure: *Yes, No, Unsure*. Although this scale was more basic as it did not allow respondents to express the range of options covered in the previous scale, it made the questionnaire easier to complete. In addition, it provided data on current practice. The *Yes, No, Unsure* scale had an added benefit in that it moved reporting away from areas that were in planning that may conceivably never be implemented. It also reduced the need for speculation as to the reasons behind responses indicating that an organisation had not considered a particular approach to its website management or maintenance.

### *Open-ended questions*

With regard to open-ended questions, there was inconclusive evidence as to the possible impact of change on this type of question. Early indicators were that a greater number of responses to these questions would be gathered. The textual content of such questions may also increase, but this view was a tentative one as the number of test responses was limited. Therefore, the initial findings suggested that as the later version of the questionnaire was easier to complete respondents may be more inclined to elaborate on their responses in the 'Other' and open ended text boxes.

It was interesting to note that, in the main, additional comments had a strategic bias as they focused on policy, management and practice. This might lead to the deduction that library website managers were using metrics as a tool to inform strategic decisions, rather than as a tool to improve the library website for visitors. Once again it is unwise to formulate conclusions from a narrow range of data as an equally valid view would be that the questionnaire was prompting this bias. Another factor to be taken into account was that libraries in the initial phases of implementing a web analytics solution would naturally be more focused upon the strategic aspects associated with devising website aims, objectives, goals and performance indicators. These potential variables needed to be monitored in the pilot study data.

### *Specifics of amendments*

Major revisions to the survey questions were presented in Tables 1-1, 1-2 and 1-3. The changes were grouped into three main themes: strategy and policy; website management; and, visitor feedback and website development. Where possible, the ways in which alterations to questions and answer scales might influence responses, and their subsequent analysis, were suggested.

*Strategy and Policy*

<b>Theme</b>	<b>Gain</b>	<b>Loss</b>	<b>Impact</b>	<b>Mitigating factors</b>
University web policy	Information on whether university web policy influenced or drove library policy.		High – provided a pointer to whether library website management was partially governed by university policy.	
Library web policies		Detail of whether policy and strategy documents were available, in planning, not considered, or would not be devised.	Low – may be difficult to analyse these data and to justify the reasons behind responses.	The revised response scale to this set of questions facilitated analysis of the links between strategy and maintenance/evaluation of the website.
Control over website	Information about the degree of control the library had over its website		High – external factors may exercise a degree of influence over libraries ability to manage their website in the way they choose.	Gathering data about visitor activity on a website was a fruitless activity for libraries unless they were able to undertake analysis of these data to inform adjustments to their website.
Decision making responsibility		Detail about who made decisions relating to the management and maintenance of the library website. Specifically: day-to-day, operational, strategic and budgetary decisions.	Medium – not a priority at this stage. Data at the micro level is viewed as less important than ensuring the questionnaire was completed by as many individuals as possible to ensure a good response rate.	If required, data on decision making could be gathered at interview.

*Table 1-1: Strategy and policy*



*Website management*

<b>Theme</b>	<b>Gain</b>	<b>Loss</b>	<b>Impact</b>	<b>Mitigating factors</b>
Management structure	Information on whether the library had a web group and if so what was its composition.		Medium – indicator to high level decision making.	
Technical abilities	Information on staff skills – technical and design.		Medium – gauge of whether staff had the necessary expertise to undertake metric analysis.	
Staying current		<p>Comparison across the sector – evaluation of other university websites and benchmarking.</p> <p>Current trends – literature reviews and networking.</p>	Low – this represented background data which set the scene for how libraries approached website management in a broad sense.	<p>Libraries use of data from website visitors was the main focus of the questionnaire.</p> <p>Focus on visitor feedback and how this was translated into website change.</p>

*Table 1-2: Website maintenance*

*Visitor feedback and website development*

<b>Theme</b>	<b>Gain</b>	<b>Loss</b>	<b>Impact</b>	<b>Mitigating factors</b>
Feedback mechanisms and visitor activity monitoring		Detail of which methods/tools were used to gauge website usability, to gather feedback, and for obtaining information on the performance of the website.	Medium – loss of detail on methods used could form the basis of a discussion on whether the most appropriate tools were being used to gather data on the themes set out.  The level of detail in this set of questions formed the basis of responses to questions themed around website change.	These data were gathered in broader terms in the revised questionnaire.  Discussion on the appropriateness of methods used could be informed by the literature.  Questions about website changes were edited in-line with the remit for boarder lines of enquiry.
Website development		Detail of which methods/tools were used to inform changes to all aspects of the website.	Medium – fine detail on what data were used to inform change provided an indicator to the level of sophistication in the use of a range of methods including web metrics.	Data on which aspect of the website were changed in response to feedback was included in the revised questionnaire.  Respondents were provided with an option to indicate whether metric data were used to inform website change.
Web metrics - activities		Detail about data analysis – what was being done, what was planned, not considered or would not be tackled.	Low – in hindsight some of these data would have been difficult to analyse unless respondents were asked to elaborate on the reasons behind their responses.	Data on these activities were gathered but the number of items in the response scale was reduced. This provided clarity for the discussion.
Web metrics: reporting practice		Detail of reporting practice: who created/received them and the level of detail therein.	Low – as above	As above.

*Table 1-3: Visitor feedback and website optimisation*

*Summary*

There was clearly a loss of detail in the data was gathered by the later version of the questionnaire. This was attributed to the reduction in the number of options in the response scales. To counter balance this, the revised questionnaire was easier to complete and clarity was improved. In its final form the questionnaire provided better background to library website management, and the part university policy played in its development. Any constraints on libraries at an institutional level were also revealed.

Response options to some questions in the earlier version of the survey were be ambiguous and the value of gathering data about what may or may not actually come to fruition questionable. In this regard the revised version had an advantage as responses provided clear indicators to librarians' current activities.

Appendix G. **NATIONAL SURVEY QUESTIONNAIRE**

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*Introductory statement*

The aim of this study is to survey current approaches to website management and maintenance among UK university libraries. For the purposes of this survey, the term library is inclusive of information services, learning and information services and archival services.

For the purpose of this study web metric data is taken to mean log file data and web analytic data. Web analytics is a term used to describe the range of activities associated with collecting, analysing and understanding website visitor activity through reports.

The questionnaire will take approximately 15-25 minutes to complete. Your input to this survey is appreciated and your response will be treated in confidence.

Please do not hesitate to contact me for further details of this survey, or if you would like to receive a copy of the findings.

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**Section 1: DEMOGRAPHIC DATA**

1. Please name your university:

	<b>Number</b>	<b>Response rate (Percent)</b>
Target population	130	53
Sample	112	62

2. What is your role in relation to the library website? (Please select only one option)

<b>Category</b>	<b>Frequency</b>	<b>Percent</b>
Webmaster/Administrator	34	49
Web Designer/Developer	5	7
Content Provider	7	10
Other	23	33
Total	69	100

3. If you selected other, please state:

<b>ID</b>	<b>Response</b>
1	Deputy Director
2	Head of Libraries
3	Website maintainer
4	I manage the web developer, currently on maternity leave
5	Head of Library Division
6	Web editor. Editorial control but not design
7	Head of team that includes Webmaster/Administrator; includes design, development and content provision
8	Some control over content and general info pages
9	Chair of Web Development Group
10	Head of Web and Portal
11	I have a [new] cross-service role re Public Information / Marketing
12	Content Provider and designers/reviewers designers/ reviewers
13	University Librarian
14	Senior manager with overall responsibility
15	Oversee the management and development of Library website which includes elements of all above
16	Administrator for Library & Content Provider
17	Web editor
18	No library web site - I'm gatekeeper for library web pages and content provider for some
19	Both Web Administrator and some Content Provision
20	Web Manager

<b>ID</b>	<b>Response</b>
21	Responsible for group redesigning Library Website
22	Involved in support, of system platform, plus content provision
23	I don't have a specific job title' re web pages. Marketing and Publications Group oversees web pages and I chair that group. If I had to choose one I guess web master would be closest.

## Section 2: WEBSITE MANAGEMENT

4. Does your university have a web policy? (Please select only one option)

<b>Category</b>	<b>Frequency</b>	<b>Percent</b>
Yes (continue to 5)	43	62
No (continue to 7)	8	12
Unsure (continue to 7)	18	26
Total	69	100

5. Does your university web policy impact on decision making in relation to the library website? (Please select only one option)

<b>Category</b>	<b>Frequency</b>	<b>Percent</b>
Yes	33	77
No	5	12
Unsure	4	9
Blank	1	2
Total	43	100

6. If yes, please give details:

<b>ID</b>	<b>Response</b>
1	Branding, wording, etc
2	It controls the design and layout of pages and also has guidance on wording
3	Guidelines agreed as to content, style, format etc.
4	The policy must be followed, it is enforced mainly by our use of a content management system.
5	Style, look and feel and logos need to be consistent with policy
6	Web 2.0 applications are not encouraged. e.g. Library videos should be hosted on an in house streaming server and not as a link to Youtube
7	We have a fair degree of autonomy since we are such a big site and have established a good relationship with the web team who trusts our web developer. However we are not entirely free to do what we like
8	Visual branding

<b>ID</b>	<b>Response</b>
9	Constrained to limits of the template
10	Style, format
11	The University web team design the templates and overall look of everyone's web site. Some features appear on all pages.
12	Design of website is controlled by corporate guidelines
13	Strategy, content management, web standards, and online branding
14	We use a University-wide content management system which constrains and controls the structure and design
15	Corporate identity, currency of information
16	Web standards affect design and content of site. Marketing guidelines affect look and branding permitted.
17	[it ought to, but there's no consistent policy as yet]
18	Overall standards and branding
19	You'd need to ask the Librarian!
20	Content guidelines
21	Look and feel, CSS, Type of content
22	There are guidelines re branding, accessibility etc
23	Constrained by limitations of web content system - Red Dot
24	Library web content is currently being migrated to the university's content management system, using standardised design, layout and navigation
25	Use the College Content Management System and follow College branding rules
26	Enforced template
27	The policy covering the web output of the university impacts upon developments within the Library, but the Library itself does not at the moment have a policy governing Library specific output - a group to define this policy is in place however.
28	Mainly things like the style guide, editing and publishing procedures
29	Restricted template
30	The 'policy' dictates a branding, templates for 'look and feel' and guidance on writing for the web. The means the library website is very restricted in how it can look and developing the templates is dependent on the web team.
31	Only at the minimal level, the University does give guidelines about the banner positioning but that is all. Otherwise Library can do what it wants.
32	Restricted to corporate template, focus of site on external audience

7. Is the library represented on the university web group/committee? (Please select only one option)

Category	Frequency	Percent
Yes	33	48
No	15	22
Unsure	7	10
No university web group/committee	13	19
Blank	1	2
Total	69	100

8. Does your university provide a web template for departments to follow? (Please select only one option)

Category	Frequency	Percent
Yes (continue to 9)	62	90
No (continue to 10)	5	7
Unsure (continue to 10)	2	3
Total	69	100

9. Is the library obliged to use the university web template? (Please select only one option)

Category	Frequency	Percent
Yes, it's mandatory	43	69
No, but it's encouraged	17	27
No, it's purely voluntary	2	3
Total	62	100

Does the library have any of the following strategic tools? (Please select all that apply)

Statement	Category		
	Frequency (Percent)		
	Yes	No	Unsure
10. A web policy document (management and maintenance guidelines)	29 (42)	34 (49)	6 (9)
11. A website strategy (direction and planning)	25 (36)	38 (55)	6 (9)
12. Website aims and objectives	27 (39)	34 (49)	8 (12)
Total	69 (100)	69 (100)	69 (100)



13. Please select the option that best applies to the management of the library website.  
(Please select only one option)

Category	Frequency	Percent
The library website is managed by an individual (continue to 17)	17	25
The website is managed by a library Group/ Committee (continue to 15)	24	35
We are a converged service and the library website is managed within a larger range of pages (continue to 17)	13	19
Other	15	22
Total	69	100

14. If you selected other, please state: (Continue to 17)

ID	Response
1	The day-to-day management falls to me as Web Manager but policy decisions are made by a Library group
2	Each area of library manages own pages with Deputy Director having overview
3	Managed by the eServices Manager & team
4	The Library website is managed by a small group, content and feedback delivered from Library staff in general
5	Managed by a small group that meet informally
6	Each area of the website has a designated editor, back up and content providers. There would be a library group set up to look at redesign or review
7	Individuals and groups
8	Converged service, but pages [historically] managed separately. University currently working on a new format likely to impact on all areas
9	In between points 2 and 3
10	Day to day management is undertaken by staff within the UL's [University Library's] Central Division. Periodic reviews are undertaken by task and finish groups convened for the purpose.
11	Managed by the Electronic Services Development Team who consult with staff about major changes, e.g. redesign
12	A bit of all of the above! Currently transitioning from individually managed, to managing within a larger range of pages, overseen by a committee
13	The Committee and its policies and strategy were disbanded following a restructuring and nothing has as yet been put in their place.
14	Re-design managed by a group and current website by various members of staff.
15	My role includes managing the web site but the Marketing and Publications Group has a key role. It meets monthly and discusses any issues that may arise and twice a year its membership is increased to include representatives from all Library teams. There is also a web administrator who is responsible for day to day maintenance.

15. How many people are there in the library web group/committee? (Please select only one option)

Category	Frequency	Percent
1	0	0
2-3	2	8
4-5	10	42
6-7	6	25
8-9	2	8
10 or more	4	17
Total	24	100

16. Which staff groups are represented on the web group/committee? (Please select all that apply)

Category	Frequency	Percent
Senior Manager	14	58
Librarian	20	83
Information Technology	10	42
Other Professional	12	50
Non-Professionals	7	29

17. What are the backgrounds of people working on the library website? (Please select all that apply)

Category	Frequency	Percent
Self-taught	48	70
Library qualification	62	90
Computer Science qualification	26	38
Publishing professional	7	10
Marketing professional	7	10
Design qualification	13	19
Statistician - data analyst	0	0
Other	7	10

18. If you selected other, please state:

**ID    Response**

1    Other skills drafted in as needed

2    [University name] staff working on any department website are trained internally by the Centre for Staff Training and Educational Development and have specific training within their department. In the Library some staff working on the site may have a Library qualification others do not.

ID	Response
3	Our web developer has a degree in business information systems - I think - and a range of IT-related qualifications, but is not a computer scientist
4	IT Trainer
5	Market Research experience
6	All receive training from University Web team on the Content management System which we have to use.
7	My previous roles have been within publishing (although I am self taught) and I have studied Fine Art as an undergraduate and Digital Design as a postgraduate
8	Some have experience of working on other websites; plus project management experience
9	Also have colleague with numerical (financial) skills that helps with statistical analysis.

How much control does the library have over its website in the following areas? (Please select only one option per question)

Statement	Category				Total
	Full control	Some control	No control	Blank	
19. Design	7 (10)	49 (71)	13 (19)	0 (0)	69 (100)
20. Content	64 (93)	5 (7)	0 (0)	0 (0)	69 (100)
21. Maintenance	35 (51)	25 (36)	9 (13)	0 (0)	69 (100)
22. Development	19 (28)	42 (61)	8 (12)	0 (0)	69 (100)
23. Budget	20 (29)	18 (26)	29 (42)	2 (2)	69 (100)

24. Please provide any other comments on how the library manages its website.

ID	Response
1	We have very little money!
2	The [University name] Website is technically managed and developed by a Web team within IT and Computing Service with the University's Marketing and Communication having responsibility for the look / content of the site. All departments manage the content for their own sites but there are some rules set by the Web Steering Board eg. All Schools have the same headings. Library content is very much controlled by the Library (or Information Services)
3	Although we use agreed templates there is some scope to structure content differently if individuals have the necessary HTML skills.
4	There is no budget, just staff time
5	Currently there is little management. We are in the process of a full website refresh where the management will be organised properly
6	Library web site is managed via a content management system and in liaison with University web development. There is no written policy. Library also has a presence on Staff portal (intranet)
7	Currently only 2 library staff (myself and one other) have the capacity to add new pages to the site and to publish pages. All other web authors are limited to editing content on existing pages. These pages go through a two-stage check before being published.

ID	Response
8	Extranet still minimal; more information concentrated on intranet. Extranet 'ticking over' pending institutional steer, including overdue Marketing strategy
9	The template is designed centrally, but within this template the library is free to organise its content as we wish. The version of the template used on the library site was also adapted slightly to suit our requirements.
10	We are currently in a transitional phase. The control of our website is governed by technical constraints including content management. This restricts flexibility in design and content. As we move to our new CMS we hope to relax these restrictions by placing more editorial and design control in the hands of the people that actually 'own' the content.
11	[University name] has its own web server. We follow guidelines laid down by the University's web team but we have considerable freedom in managing the site
12	We are to have less control over the design as we are now expected to use new University templates.
13	There is no specific budget set aside for the 'Library' web pages.
14	We use a college wide content management system, but have full control over the Library web site content
15	Primarily the website is maintained by one individual who will react to the demands or requests placed on him by any interested party from within the Library.
16	No library web site. We have library pages on the university's three web sites - for staff, current students and potential students.
17	The Library webpages (along with all other University support service pages) must conform to the University brand. Look & Feel of the pages are therefore set within a Content Management system. As Web administrator I also manage a team of library staff who provide and maintain content across our pages. Devolved management can be problematic even within a CMS, as consistency varies and all staff with web page management responsibility have many other time pressures in the 'real' world. Sometimes our virtual presence suffers because of this. However, shared responsibility does provide staff development opportunities and different ideas.
18	The site is managed by a group who have other responsibilities. Provision of content and maintenance is done as part of other duties. We had help from the University web team with the initial design and set-up and they assist with technical problems. There is no budget as such for the library web pages
19	We manage our site with a home-grown CMS but are migrating it over to an enterprise CMS.
20	Up until now different bits have been managed by different staff and as a result, it has gone too big for the original design. It is hoped once it re-designed that there will be a more organised approach.
21	Maintenance of the site has not been a problem; developing a website within constraints (branding, templates - some of which are not well thought out nor implemented correctly; and with dependencies on a web team that is often not fully-engaged with the task, is a fraught business!
22	The way the site is managed reflects the culture of the University. Tight control is not imposed but people are expected to take responsibility. My role is to have a watching brief to make sure things are done.

**Section 3: WEBSITE MONITORING**

25. Does the library investigate the use of its website? (Please select only one option)

Category	Frequency	Percent
Yes (continue to 26)	52	75
No (continue to 31)	14	20
Unsure (continue to 33)	3	4
Total	69	100

26. Please indicate the options employed to undertake user studies, and for monitoring website performance. (Please select all that apply)

Category	Frequency	Percent
Survey	34	65
Focus group	27	52
Task setting (observing users working through a set of activities on the website)	20	39
Anecdotal evidence	26	50
Other	22	42

27. If you selected other, please state:

ID	Response
1	Web stats
2	Google analytics
3	Informal discussions, Google analytics
4	Not started, but will be doing a usability study this term.
5	Google analytics
6	Google analytics reports
7	Webpage usage statistics
8	User behaviour via data on pages visited etc
9	Web stats
10	Currently gets usage stats
11	Use of software e.g. crazyEgg and Google Analytics to look at how a webpage is being used, where we get referrals from, number of times accessed. Have also used counters to see how many times a page is accessed.
12	We are provided with monthly statistics from the Content Management System via a system called Webtrends
13	We have feedback gathered from individual web pages
14	Usage statistics
15	Web statistics

**ID    Response**

16	All of the above are due to be undertaken since we moved to the new database driven system in September and the library pages are due to be fully merged with IT over the summer.
17	Google analytics
18	We respond to users concerns should they make them known via an online request / troubleshooting form.
19	Statistics of use
20	Feedback forms, course committees etc
21	We also use Google Analytics
22	Departmental group meetings
23	Statistical analysis from monthly reports

28. Is this intelligence used to inform changes to the library website?

Category	Frequency	Percent
Yes	46	89
No	3	6
Unsure	3	6
Total	52	100

29. Which aspects of the website are changed in response to user feedback. (Please select all that apply)

Category	Frequency	Percent
Website structure	25	54
Website design	16	35
Navigation	34	74
Interactivity (RSS, Multimedia, Blog, etc)	18	39
Technical (Code elements)	5	11
Labels/terms	25	54
Page design	18	39
Page contents (Textual elements)	38	83
Other	4	9

30. If you selected other, please state (Please go to question 33)

**ID    Response**

1	Basically whatever was commented upon
2	We are only just embarking on this process - all the above are up for review
3	Everything - all the feedback is being used to design the new website
4	information priorities
5	Occasional changes of design or structure if a case can be made to the University Web Team

31. Please indicate the reasons for not monitoring the use of the library website.  
(Please select all that apply)

Category	Frequency	Percent
Lack of time	11	79
Difficult to recruit participants	0	0
Lack of funds	5	36
Staff lack skills	6	43
Other	5	36

32. If there are other reasons, please state: (Please go to question 33)

ID	Response
1	When redesigning the website recently we did use a survey and focus groups
2	Just moved to a new CMS so not had time yet to think about monitoring as have been working to set up & add content
3	No information from University web management about usage. Student surveys do include general questions about web site but no time for more detailed survey. We do concentrate on e-resources and the OPAC
4	This facility is not provided by our ICT department
5	Lack of usable statistics - module used by the university does not give hit rates etc
6	As far as I'm aware there is no way to collect stats on how people use and access our website. We could offer a survey but students are always bombarded with surveys and we don't have the control to change much anyway.
7	Lack of access to the tools of monitoring.

#### Section 4: WEB METRICS – LOG FILES

33. Do you use server log file data to assess the use of your website?

Category	Frequency	Percent
Yes (continue to 34)	33	48
No (continue to 57)	27	39
Unsure (continue to 59)	9	13
Total	69	100

34. For how long have you been collecting server log file data from the library website?

Category	Frequency	Percent
0-5 months	2	6
6-11 months	1	3
1-2 years	2	6
Over 2 years	27	82
Blank	1	3
Total	33	100

35. Please indicate whether the library is engaged in any of these activities associated with analysing web server log file data. (Please select all that apply)

Category	Frequency	Percent
Raw data are being examined	11	33
General trends in the data are being followed	25	76
In-depth analysis of the data is undertaken	3	9
Key performance indicators are monitored	8	24
Reports on the data are being produced	15	46
Changes are made to the website in response to the data	15	46
Other	3	9
Blank	1	3

36. If you selected other, please state:

ID	Response
1	You'd need to ask the Librarian
2	We look at this data when redesigning but probably don't make as much use of it as we could.
3	Since September collection of data has been taken over by the University Web Team

37. What types of data analysing practice are in operation? (Please select all that apply)

Category	Frequency	Percent
External consultant/company create reports	0	0
Library staff create reports	16	49
University computing staff create reports	15	46
Reports are provided by the university web group (or similar)	4	12
Page owners carry out their own analysis	5	15
Other	5	15
Blank	1	3



38. If another practice is followed, please state:

<b>ID</b>	<b>Response</b>
1	Google Analytics reports
2	Web admin creates reports on request
3	Google Analytics
4	You'd need to ask the Librarian
5	We use a statistical program which provides data to help us assess our website.
6	For certain areas of the site I have written custom code to capture usage and produce reports
7	Currently analysed to inform pending changes to website but use has been very ad hoc

39. What types of reporting practice are in operation? (Please select all that apply)

<b>Category</b>	<b>Frequency</b>	<b>Percent</b>
A general report is provided to Management	10	30
Management are provided with a detailed report on the data	1	3
Targeted reports are created for different teams	7	21
Page owners are provided with reports on the performance of their pages	8	24
Other	10	30
Blank	1	3

40. If another practice is followed, please state:

<b>ID</b>	<b>Response</b>
1	Reports generated online; some provided ad hoc
2	Statistics are published monthly for all staff on the University intranet
3	The website development process is iterative and responsive to general staff and user feedback
4	None. Usage is tracked but reports are not written.
5	You'd need to ask the Librarian
6	We don't report really.
7	Beyond monitoring the overall trends we have not done very much with the reports produced
8	Analysis is done when requested to inform decisions on future work
9	Currently none
10	Marketing and Publications Group are presented with analyses twice a year.

With the library website in mind, please indicate how much you agree with the following statements on the benefits of server log file collection and analysis.

Q.41 The web server log file solution was easy to implement

Q.42 Log file analysis helps us to understand the use of the library website

Q.43 Log file analysis complements the library's other forms of data analysis

Q.44 Log file analysis provides general guidance information

Q.45 Log file analysis provides data for targets set for the library website

Q.46 Log file analysis provides the library with actionable data

Question	Category						Total
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Blank	
41.	7 (21)	9 (27)	12 (36)	3 (9)	1 (3)	1 (3)	33 (100)
42.	8 (24)	19 (58)	3 (9)	1 (3)	1 (3)	1 (3)	33 (100)
43.	4 (12)	18 (55)	10 (30)	0 (0)	0 (0)	1 (3)	33 (100)
44.	5 (15)	24 (73)	2 (6)	1 (3)	0 (0)	1 (3)	33 (100)
45.	2 (6)	6 (18)	16 (49)	1 (3)	2 (6)	1 (3)	33 (100)
46.	3 (9)	17 (52)	1 (3)	2 (6)	0 (0)	1 (3)	33 (100)

47. Please detail any other benefits:

ID	Response
1	We don't act upon the data in a proactive way really but it confirms areas of the site are being used and resources contained therein.
2	Easier than student surveys, but only just as Nettracker is a terrible log analysis program
3	Enables us to maintain a list of 'quick links' based on popular pages
4	It helps us to identify the most and least popular pages. Where we think important content is being missed, we can then increase its visibility on the site.
5	I don't know if the Library staff use any of these
6	Usage statistics can often be misleading and should not be taken as defining actual usage in themselves. The report currently provided by the computing service is severely lacking in detail.
7	We find them of limited use but are moving to Google Analytics which might provide more useful data

With the library website in mind, please indicate how much you agree with the following statements on the drawbacks of log file analysis.

Q.48 There are concerns over the accuracy of log file data

Q.49 There are concerns over the security of log file data

Q.50 There are problems with configuring web server log data

Q.51 The amount of data generated is overwhelming

Q.52 There are issues with knowing how best to use the data for making decisions about the website

Q.53 Staff do not have the necessary skills to make the most of log file data

Q.54 Staff do not have the necessary time to analyse and interpret log file data

Q.55 There are insufficient funds to enable the library to get the most out of the available data

Question	Category						Total
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Blank	
48.	1 (3)	12 (36)	8 (24)	10 (30)	1 (3)	1 (3)	33 (100)
49.	0 (0)	0 (0)	17 (52)	13 (39)	2 (6)	1 (3)	33 (100)
50.	2 (6)	5 (15)	13 (39)	10 (30)	2 (6)	1 (3)	33 (100)
51.	5 (15)	9 (27)	8 (24)	8 (24)	1 (3)	2 (6)	33 (100)
52.	2 (6)	22 (67)	4 (12)	4 (12)	0 (0)	1 (3)	33 (100)
53.	4 (12)	10 (30)	7 (21)	7 (21)	4 (12)	1 (3)	33 (100)
54.	10 (30)	9 (27)	8 (24)	4 (12)	0 (0)	2 (6)	33 (100)
55.	3 (9)	12 (36)	11 (33)	6 (18)	0 (0)	1 (3)	33 (100)

56. Please detail any other drawbacks: (Please go to question 59)

ID	Response
1	Computing staff collect the data so the library team is somewhat removed from the process.
2	When I took over as web admin, I discovered that most of the stats that were collected were meaningless as people did not fully understand the figures they were extracting from the logs.
3	See above. [I don't know if the Library staff use any of these]
4	I am unable to request targeted data for areas of the website I would like to investigate further. Logs are kept by the computing service and not released so that processing can be done on an adhoc basis. The reports give general usage data that only serves to confirm general trends I am already aware of

57. Please indicate the reasons for not monitoring your library website server log files. (please select all that apply)

Category	Frequency	Percent
Lack of time	11	41
Lack of funds	3	11
Staff lack technical skills	10	37
No access to web server	11	41
Limited access to web server	6	22
Other	6	22
Blank	1	4

58. If there are other reasons, please state:

ID	Response
1	It is possible to get statistics of times a page is accessed but we don't have time to monitor these systematically and only check them for specific reasons
2	New system see previous question
3	The logs provided by our IT are in summary only and not worth analysing.
4	We use 'page tagging' rather than log file analysis
5	Few of our pages are on web servers
6	We use web analytics
7	See above on the statistics analysis module provided by the university. [lack of usable statistics - module used by the university does not give hit rates etc]
8	Reliability of log files compared to analytical 'rich' software now used e.g. Google analytics/ site intelligence

## Section 5: WEB METRICS – WEB ANALYTICS

59. Do you use a web analytic tool to assess the use of your website?

Category	Frequency	Percent
Yes (continue to 60)	33	48
No (continue to 86)	28	41
Unsure (continue to 88)	8	12
Total	69	100

60. For how long have you been collecting web analytic data from the library website?

Category	Frequency	Percent
0-5 months	4	12
6-11 months	3	9
1-2 years	8	24
Over 2 years	17	52
Blank	1	3
Total	33	100

61. Please indicate which of the following tools are currently used to collect web analytic data. (Please select all that apply)

Category	Frequency	Percent
Free web analytic tool	24	73
Hosted web analytics solution	3	9
Paid for web analytics solution	6	18
Other	3	9
Blank	1	3

62. If you use another tool, please state:

ID	Response
1	Google analytics - not sure which of the above this is
2	As the tool is operated by our Web Office I do not know if it is hosted and/or paid for
3	You'd need to ask the Librarian
4	Unsure where they got it: I suspect it's freeware

63. Please indicate whether the library is engaged in any of these activities associated with analysing web analytic data. (Please select all that apply)

Category	Frequency	Percent
Raw data are being examined	11	33
General trends in the data are being followed	25	76
In-depth analysis of the data is undertaken	3	9
Key performance indicators are monitored	8	24
Reports on the data are being produced	17	52
Changes are made to the website in response to the data	12	36
Other	3	9
Blank	0	0

64. If you selected other, please state:

**ID Response**

1	A monthly report of hits and top 10 pages is generated. Other information is generated on an ad hoc basis as required.
2	You'd need to ask the Librarian
3	We see this as the same as web stats (previous page)

65. What types of data analysing practice are in operation? (Please select all that apply)

Category	Frequency	Percent
External consultant/company create reports	1	3
Library staff create reports	21	64
University computing staff create reports	6	18
Reports are provided by the university web group	7	21
Page owners carry out their own analysis	6	18
Other	3	9
Blank	2	6

66. If another practice is followed, please state:

**ID Response**

1	Only used for a very small % of content - no time for more!
2	You'd need to ask the Librarian
3	These are repeated questions
4	Web manager provides reports

67. What types of reporting practice are in operation? (Please select all that apply)

Category	Frequency	Percent
A general report is provided to Management	10	30
Management are provided with a detailed report on the data	3	9
Targeted reports are created for different teams	13	39
Page owners are provided with reports on the performance of their pages	7	21
Other	7	21
Blank	2	6

68. If another practice is followed, please state:

ID	Response
1	Reports are not produced.
2	The Web Development Group considers reports
3	Reports are created but not disseminated
4	You'd need to ask the Librarian
5	See above [A monthly report of hits and top 10 pages is generated. Other information is generated on an ad hoc basis as required.]
6	Reports are generated depending on need
7	Ad hoc reports on particular areas of the site, per management requests
8	Marketing and Publications Group are presented with findings.

With the library website in mind, please indicate how much you agree with the following statements on the benefits of web analytics.

Q.69 The web analytics solution was easy to implement

Q.70 Web analytics helps us to understand the use of the library website

Q.71 Web analytics complements the library's other forms of data analysis

Q.72 Web analytics provides general guidance information

Q.73 Web analytics provides data for targets set for the library website

Q.74 Web analytics provides the library with actionable data

Question	Category						Total
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Blank	
69.	10 (30)	12 (36)	7 (21)	1 (3)	0 (0)	3 (9)	33 (100)
70.	11 (33)	18 (55)	1 (3)	0 (0)	0 (0)	3 (9)	33 (100)
71.	7 (21)	18 (55)	5 (15)	0 (0)	0 (0)	3 (9)	33 (100)
72.	6 (18)	24 (73)	0 (0)	0 (0)	0 (0)	3 (9)	33 (100)
73.	4 (12)	9 (27)	10 (30)	7 (21)	0 (0)	3 (9)	33 (100)
74.	5 (15)	16 (49)	7 (21)	2 (6)	0 (0)	3 (9)	33 (100)

75. Please detail any other benefits:

<b>ID</b>	<b>Response</b>
1	see answers for web stats
2	The data is real, therefore useful to inform discussion about what to do with the Web. For example, everyone has some opinion on what the most "important" parts of the Web site are, but the stats don't lie about how much of our traffic goes to say the pages on e-resources.
3	Informs the creation of 'quick links' based on popular pages
4	Sitestat installed by University web team.
5	You'd need to ask the Librarian
6	repeated questions
7	Using Google Analytics provides an easy way of identifying usage for small targeted areas of the Library website and subsites. However there are drawbacks and data is not complete.



With the library website in mind, please indicate how much you agree with the following statements on the drawbacks of web analytics.

Q.76 There are concerns over the accuracy of web analytic data

Q.77 There are concerns over the security of web analytic data

Q.78 There are problems with configuring web analytic tools

Q.79 There are difficulties with ensuring all pages are correctly tagged

Q.80 The amount of data generated is overwhelming

Q.81 There are issues with knowing how best to use the data for making decisions about the website

Q.82 Staff do not have the necessary skills to make the most of web analytic tools

Q.83 Staff do not have the necessary time to analyse and interpret web analytic data

Q.84 There are insufficient funds to enable the library to get the most out of the available data

Question	Category						Total
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Blank	
76.	1 (3)	12 (36)	8 (24)	7 (21)	0 (0)	5 (15)	33 (100)
77.	1 (3)	0 (0)	9 (27)	17 (52)	1 (3)	5 (15)	33 (100)
78.	0 (0)	8 (24)	7 (21)	9 (27)	2 (6)	7 (21)	33 (100)
79.	0 (0)	6 (18)	8 (24)	10 (30)	3 (9)	6 (18)	33 (100)
80.	4 (12)	9 (27)	5 (15)	8 (24)	1 (3)	6 (18)	33 (100)
81.	1 (3)	18 (55)	4 (12)	4 (12)	0 (0)	6 (18)	33 (100)
82.	1 (3)	15 (46)	7 (21)	3 (9)	3 (9)	4 (12)	33 (100)
83.	5 (15)	18 (55)	2 (6)	4 (12)	0 (0)	4 (12)	33 (100)
84.	1 (3)	10 (30)	12 (36)	4 (12)	1 (3)	5 (15)	33 (100)

85. Please detail any other drawbacks:

ID	Response
1	see answers for web stats
2	We only use google analytics at a very basic level and mostly when a manager asks for information
3	The data only confirms the number of hits, not whether those hits come from students of the University. Lack of qualitative data - we don't know why people have behaved as they have
4	This whole section seems to be repeated.
5	You'd need to ask the Librarian
6	repeated questions

86. Please indicate the reasons for not using a web analytic tool to assess the use of your website. (Please select all that apply)

Category	Frequency	Percent
Lack of time	15	54
Lack of funds	8	29
Staff lack technical skills	15	54
No access to web server	13	46
Limited access to web server	4	14
Other	3	11

87. If there are other reasons, please state (Please go to question 88)

ID	Response
----	----------

- |   |   |
|---|---|
| 1 | Please see previous answer  |
| 2 | We only maintain a branch of the [university name] web server and analytic tools must generally be applied at root level which we can't do. |
| 3 | Not convinced of benefits   |

## Section 6: FEEDBACK

88. Please provide any additional comments you may have about the library's website management and maintenance activities:

ID	Response
----	----------

- |   |   |
|---|---|
| 1 | The problem with this is that I do this in addition to all of my other subject librarian duties, so it can be a rainy day job!  |
| 2 | We should be doing much more but there is not time. At the moment I keep statistics of how many times the online information skills page are accessed and then provide other statistics on request. We also monitored the number of access to the [university name] pages for new students at the start of the academic year to know when is the time that new students start accessing that to help to establish deadlines for the next academic year. |
| 3 | I would love to be able to do more analysis of the use of our website and do some usability testing, but I just don't have time to do the work or to implement the results. I would be willing to help you further but it depends on what time I have available!  |
| 4 | We are launching a new web site in the very near future so I would imagine this sort of data will be both easier to collect and utilise.  |
| 5 | We are in the middle of a project to change the way the Web site is managed, which involved devolving control of maintenance of "content" to managers. Web analytics are being used in part to inform changes to the site during this project.  |
| 6 | It's possible that the University monitors the usage of individual department website, or could provide data on request, but I'm unsure of this.  |

ID	Response
7	During the web refresh we are moving to a new CMS that I will have access to, and I will start to use Google Analytics to monitor usage
8	The external library web pages are very much for marketing purposes and are not monitored as the internal portal pages for staff and students.
9	We are in the process of changing the main Library web pages - Home page and several pages directly below that (although the lower level pages with detailed content need to stay as they are at the moment as they were created in the old University CMS and cannot be changed significantly at the moment) and hope to include Google Web Analytics as part of that so we will then have monitoring of the site and hope to see if the new pages provide clearer navigation to part of the site. This should happen over the next month or so.
10	We do receive some data from the University IT Service about use of our pages but this is not regular or consistent. We do analyse how some pages are being used and provide in depth analysis which is regularly reviewed of or Institutional Repository website. We have analysed the use of key pages such as our Digital Library access to our electronic resources.
11	The university has not long implemented a new LMS in conjunction with a new template. We are still experiencing teething problems. The template defines a rather linear page structure
12	Don't know if this is the best place to comment on this but we do have a very good relationship with the University web team and we are kept in the loop by them. This is less true with Marketing who have overall control of the design of the University website. In the past they have decided to change the main University website with little notice and this does have quite an impact on the Library site due to other (printed) materials then being outdated!
13	There's a lot of potential useful information to be had from web analytics but as it's not rally part of anyone's job description and there's a fair bit of extra work involved, our use of it has been very piecemeal in the past. We've also been through 3 different systems in the last 4 years (Analog -> Sawmill -> SiteStat) meaning stats have not been comparable (hence I inserted Google Analytics code 2 years ago for consistency).
14	Am not aware of any tools being used currently, but they are being considered for the future
15	This lack of monitoring facilities is something we are trying to address with the new CMS.
16	Web analysis tools are not used much here. They provide some useful data on page usage for example but that although interesting doesn't take you very far in making decisions on the site.
17	The Library website is currently undergoing redevelopment and we will be considering website monitoring as a apart of this process.
18	The library does not monitor data individually but requests data from the university web master on most popular pages, e-resource usage, number of visitors in a year.
19	We probably don't make best use of what is available to us really in terms of analysis and usage of the website. I feel that we don't get enough feedback from actual users, especially when redesigning.
20	The system used provides useful data which is published in detail by the web team. It is then up to departments to analyse and produce reports for interested parties. Shame about the repeated questions on this questionnaire. It might be worth contacting the [email address] for details of methods used and actions taken regarding user feedback. Good Luck and sorry for the delay in replying.
21	We plan to make more use of web metric data in the future
22	A number of library staff receive sitestat reports produced by the University web team but we don't currently do much with them.
23	ensuring that actions identified and followed up
24	Hope to maintain and monitor use of Library Website more effectively once it has been re-designed.

**ID    Response**

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- 25    We do have feeds from the Library blogs on to the front page of the library site and we have stats for the blogs which aren't quite comparable but give a rough idea of usage.
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- 26    The process itself is useful because it generates data that gets people talking about the web. Just having to think about what data to have is useful in itself. Evidence based practice is important in all aspects of library management and this includes the web pages. I think the library sector has done little to take forward this area compared to the private sector. It would be good if the University gave some guidance on best practice but until then it will be a case of learning as we do it.
- 

89. Please indicate whether you would like to be contacted as a follow up to this questionnaire.

<b>Category</b>	<b>Frequency</b>	<b>Percent</b>
Yes please send me a summary of the findings	51	39
Yes I would be willing to provide clarification of my responses be interviewed or provide a case study for this research	20	15
My name and email address are	57	44

Thank you for your response to this survey.

Appendix H. **USER STUDY METHODS: ADVANTAGES AND DISADVANTAGES**

The following Tables illustrate the advantages and disadvantages of website user study methods adopted by UK university library website practitioners.

<b>Method</b>	<b>Advantages</b>	<b>Disadvantages</b>
Library survey	Investigation of all aspects of library service.  General questions about library website.  Indicator of website satisfaction levels.  Indicated reasons for using the library website – e-resources, catalogue and route into the VLE. Highlighted under used pages and resources, for example, library news.  Informed usability study.	Have not conducted survey specifically about the library website as there are a large number of student surveys at the university.  Low response rates.
Targeted feedback	Views on particular themes identified and investigated.  Enabled library staff to canvas views from particular user groups.	
Feedback forms (online, paper or email)	Allowed library staff to respond to user concerns.  Informed on user workflows, user needs, and therefore highlighted development opportunities.  Targeted feedback on user concerns which were addressed by changing or removing a page.	Not many comments were received via this route.
Face-to-face: via help desk or through role of academic librarian (subject librarian)/anecdotal evidence	Observation highlighted areas of the website where students struggled.  Specific feedback informed change to page content.	Users do not like change at any level of intervention.

<b>Method</b>	<b>Advantages</b>	<b>Disadvantages</b>
Usability study (task setting)	<p>Presented an opportunity to observe users undertaking set tasks on the library website.</p> <p>Confirmed library staff views on website use.</p> <p>Unexpected user actions were revealed.</p> <p>Students' and librarians' perceptions/expectations of library website differed.</p> <p>Highlighted a lack of awareness of the library's subject librarians.</p> <p>Showed that researchers and staff had a good awareness of library services for them and they were targeted in their use of the library website.</p> <p>Informed discussion on website change.</p> <p>Conducted as part of student projects.</p>	<p>Not enough time to undertake the necessary work.</p>
Social networking sites	<p>Communicated with users directly in systems they are using.</p>	
Quick online polls	<p>Provided immediate feedback on targeted question about a service.</p>	
Focus group	<p>Library focus groups provided comments and suggestions on the website.</p>	<p>Student focus group participants failed to respond to short survey on library website.</p>
General staff and user comments	<p>Informed website development.</p>	<p>Everyone has a view on what they thought the library website should be contain.</p>
Horizon scan	<p>Provide an opportunity to view other library websites.</p>	<p>Things that work for one library may not be appropriate at another.</p> <p>Replicating another library's website is not appropriate.</p>

Method	Benefits identified	Drawbacks identified
Web server log files	<p>Easier than student survey.</p> <p>Used to monitor general trends.</p> <p>Confirmed page, resource and section use.</p> <p>Informed a list of quick links of popular pages.</p> <p>Identified the most/least popular pages.</p> <p>Provided an opportunity to increase the visibility of missed content.</p> <p>Informed website development decisions.</p> <p>Informed website redesign.</p>	<p>Data are of limited use.</p> <p>Data are misleading/misunderstood.</p> <p>The data are lacking in detail.</p> <p>Unable to request targeted data from IT Department.</p>
Web analytics	<p>Showed how webpages were used.</p> <p>Identified heavy use to certain sections (e-journals and databases), and key pages.</p> <p>Top 10 pages per month monitored.</p> <p>Informed a list of quick links of popular pages.</p> <p>Informed when time sensitive pages were made available to the target audience.</p> <p>Navigation paths to key pages investigated.</p> <p>Revealed trends in website usage and peak access times.</p> <p>Evidence of use informed decisions.</p> <p>Resources that are time intensive to create were monitored. Usage informed on publicising resources, revision and future direction.</p> <p>Informed take-up of new resources/ services.</p> <p>Under used pages were amalgamated or removed based on usage data.</p> <p>Justification for analysis if return on investment identified.</p> <p>Informed spending for Academic</p>	<p>Statistics were viewed as an indicator only.</p> <p>There were gaps in the data.</p> <p>Data was misleading/misinterpreted.</p> <p>Data was inaccurate.</p> <p>Data were available but did not really inform change.</p> <p>What does the data mean?</p> <p>What to do with the data?</p> <p>Change was not always possible due to university web set-up, and the requirement to maintain website continuity for course materials.</p> <p>Not enough time was available to undertake analysis.</p> <p>Other factors needed to be taken into account to get complete picture of website usage. For example, the introduction of a news blog influenced visits to some website pages.</p>

<b>Method</b>	<b>Benefits identified</b>	<b>Drawbacks identified</b>
	<p>Faculties.</p> <p>Usage statistics were available for management on request.</p> <p>Move away from uninformative KPIs and across the board data analysis to more targeted use to inform change.</p> <p>Bounce rates were considered in relation to page type (linking or content page).</p> <p>Trends informed a usability study.</p>	
Page counters	Showed how many times a page was accessed.	
Crazyegg (Heat Maps and track clicks)	Showed how webpages were used.	