

The use of web analytics in identifying key market segments for an open access digital repository. A Case Study of the Digital Education Resource Archive.

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Abstract

This research investigates the role of web analytics platforms in identifying the key market segments for DERA, a digital repository developed by the Institute of Education to preserve electronic publications published by government and other organisations related to education.

The research aims to demonstrate the importance of market segmentation as a precursor to effective marketing activities and examines the capacity of web analytics as a segmentation tool.

Adopting an exploratory research design, this Case Study gathers qualitative data from a thematic literature review and interviews to develop a model to collect relevant quantitative data from a web analytics platform to assist in segmenting the users of DERA into identifiable groups.

The literature indicates that marketing is broadly acknowledged as an essential component in communicating the value of libraries and that segmentation facilitates the adoption of differentiated strategies according to the needs of specific segments. Whilst the importance of marketing is acknowledged by the DERA Working Party, a formal marketing strategy has not been developed and perceptions of key market segments are informed chiefly through anecdotal evidence. The development of two models of segmentation for the Google Analytics platform are proposed and digital dashboards are created that provide summaries of key metrics and insights related to the users of DERA.

The research concludes that web analytics can contribute towards effective segmentation. However technical issues related to Google Analytics on DERA show that selection of the most appropriate analytics platform is vital. Concerns over privacy and ownership of data are also important considerations to be addressed if web analytics are to be fully embraced. Finally, web analytics can only give insight into the 'what, how and when' of user activity on DERA, demonstrating the need for additional qualitative data to understand the deeper motivations for usage of the resource.

Glossary

- Bounce Rate:** The percentage of visits in which the visitor only views one page of a website before leaving. A high bounce rate may indicate that the site or page visited does not contain the information the visitor was looking for (E-Power Marketing, 2015).
- Cookies:** A snippet of text data that retains information from webpage to webpage and from visit to visit. (E-Power Marketing, 2015). In the case of web analytics, these cookies will contain no personally identifiable information (Kaushik, 2010, p. 68).
- DERA:** The Digital Education Resource Archive: a digital archive of documents related to education, training and skills primarily published by government and quasi- governmental organisations. Developed and maintained by the Institute of Education Library, University of London.
- Dimensions:** A descriptive attribute or characteristic of data. Examples of a dimension within web analytics might include *Browser Type*, *Session Duration*, *Exit Page* (Google, 2015).
- Entry Page:** The first page seen by the user on visiting a web page (Web Analytics Association, 2008, p. 15).
- Exit Page:** The last page on a site visited by the user, this will signify the end of a session (Web Analytics Association, 2008, p. 17).
- Metric:** A quantitative measurement of data. Examples of a metric within web analytics might include *Pages per session* or *screenviews* (Google, 2015).

Pageview:	A page being loaded into a web browser (Google, 2015).
Return Visitor:	A record of a unique visitor who has previously visited the site prior to the existing reporting period. This is helpful in determining the loyalty and affinity of website users. (Web Analytics Association, 2008, p. 23)
Sessions:	A group of interactions that take place on a website within a specific time frame. (Google, 2015; Web Analytics Association, 2008, p. 11) In the case of Google Analytics a session will end after 30 minutes of inactivity.
Traffic:	Total number of visits to a website; web analytics can analyse the source of these visits, for instance whether the website was accessed directly, via search engine or through paid advertising campaigns (E-Power Marketing, 2015).
Unique Visitors:	An approximation of the number of people who visit a website over a specific reporting period; this is calculated by placing a unique cookie on the web browser. This cookie remains on the browser even after the visitor has left the site and a web analytics platform can recognise if the website is re-visited by that same browser within a specific time frame (Kaushik, 2010, p.68).
Web Analytics:	The measurement, collection, analysis and reporting of web data in order to understand and optimise the performance of a website (Web Analytics Association, 2008, p. 3).

DECLARATION

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Signed (candidate)

Date

STATEMENT 1

This work is the result of my own investigations, except where otherwise stated.

Where ***correction services** have been used, the extent and nature of the correction is clearly marked in a footnote(s).

Other sources are acknowledged (e.g. by footnotes giving explicit references).

A bibliography is appended.

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Chapter 1: Introduction

1.1. Market Segmentation and the Use of Web Analytics

In order to develop an effective marketing plan for a product, it is first necessary to arrive at an understanding of the needs and wants of the consumer. The challenge that organisations face is that they ‘know that they cannot satisfy all consumers in a given market – at least not all in the same way’ (Kotler & Armstrong, 1996, p. 93). Marketers have responded to this challenge by deploying market segmentation techniques. By establishing a set of variables or characteristics used to group customers together into identifiable segments (Wedel, 2000, p. 4), organisations can attempt to implement marketing activities that address the discrete wants and needs of these groups.

Various means of segmentation have been used by marketing professionals, ranging from relatively straightforward techniques based upon geography or demographics through to more complex measures such as behaviours, values and life-style (Frank, Massey, & Wind, 1972). However, these segments can only be viable if they fulfil certain criteria; the segment must possess identifiable characteristics, it must be large enough to justify the cost and effort involved in formulating a marketing plan for it, and there must be an effective means of communicating with it. (de Saez, 2002; Gierveld, 2006; Lee, 2004).

Since the advent of the internet and the development of online commerce it has become clear that even more complex segmentation techniques are possible. This has led to the development of new typologies in order to describe these segments (Bressolles, Durrieu, & Senecal, 2014, p. 799) such as ‘e-window shoppers’, ‘interactive shoppers’ and ‘risk averse shoppers’ (Ganesh, Reynolds, Luckett, & Pomirleanu, 2010, p. 112). It has been claimed that gathering this

complex information is less costly than in the offline world, thus enabling organisations to move towards something akin to 'real "one-to-one" marketing'. (Kau, Tang, & Ghose, 2003, p. 155). One tool that has been widely employed by organisations in order to gather activity related to their online presence is web analytics.

Web analytics have been feted for fuelling the growth of online marketing (Beasley, 2013, p. 3) as it enables marketers to measure the effectiveness of their work by allowing them to track the journey of the user from their arrival on a web page through to their decision to leave. Site owners are able to utilise web analytics through the insertion of a JavaScript tracking code at the start of each page on the site, enabling the information collected from cookies left by the site visitor to be stored and assembled on the servers of the web analytics platform where it can then be viewed by the site owner in the form of pre-prepared and customisable reports. The insights gained from the data available through analytics can then be used to improve the experience of the online customer, ultimately leading to increased revenue for the business (Waisberg & Kaushik, 2009, p. 5). The impact of web analytics in the commercial world is such that they are regarded as 'an integral part of core business strategies' (Digital Analytics Association, 2014). Libraries have become increasingly aware of the need to understand the online behaviours too, with web tracking technologies offering the opportunity to collect large amounts of data unobtrusively which can then be analysed and acted upon (Fourie & Bothma, 2007, p.270).

1.2. The Aim of this Study

The aim of this study is to investigate to what extent the use of web analytics can assist Library and Information Professionals in creating meaningful market segments for an open access digital repository. In order to achieve this aim the following objectives have been identified:

1. Investigate the attitudes of those working with a Digital Repository towards marketing.
2. Outline the importance of market segmentation in effective marketing.
3. Identify existing perceptions of users of a digital repository amongst Library and Information Professionals
4. Investigate the existing use of commercially available web analytics software within the library and information sector and identify the most appropriate software platform(s) for this research
5. Select the most useful data available from web analytics to determine viable market segments
6. Investigate whether segments identified by web analytics confirm or challenges the perceptions of the market held by Library and Information Professionals
7. Identify the limitations of using web analytics to segment the market and suggest means of obtaining further data to inform the segmentation of the market for open access repositories.

1.3. Background to the Case Study

The Institute of Education Library (known as the Newsam Library and Archives) is regarded as Europe's largest education library (Newsam Library and Archive, 2014a), it serves over 7500 students and 800 staff (Institute of Education, 2014) as well as visiting students, academics and researchers from around the world. The Official Publications Collection is the largest Special Collection within the Library and contains printed material related to state education in the United Kingdom from the 19th century through to the present day. It is unusual in that its scope reaches beyond the Parliamentary and Departmental publications that often characterise an Official Publications collection to include the published output of quangos, non-departmental public bodies and pressure groups (Newsam Library and Archive, 2014b).

The past decade has seen a move towards 'born digital' official publications and this has posed challenges for the whole library sector in terms of adapting and developing their collection policies. The digital availability of documents has increased visibility and accessibility for researchers (Inman & Picton, 2012, p. 2) with government output available via sites such as gov.uk (Government Digital Service, 2014) and the UK Government Web Archive (The National Archives, 2014). However, there have been some longstanding concerns over whether a digitally available collection of Official Publications can match the comprehensiveness of a print collection (Chapman, 2013, p. 4). In addition, some digital resources appear to be almost impossible to track down due to the 'constant cycle of closure, merger or reconstitution of official bodies' (Evans, 2011, p. 23).

The IOE Library became increasingly aware of this issue as users began to complain about the number of broken links to digital versions of Official Publications accessed through the Library Catalogue. At first this 'link-rot' (Parker, 2007, p. 172) was tackled by a project whereby library staff would find the document online, print it

out, catalogue it and add it to the printed collection. This time consuming and labour intensive process could only be seen as a sticking plaster; with over 1200 broken links already identified, the Library began planning a response to the issue in the form of a digital repository which would be established to harvest born digital material related to education training and skills, providing a permanent and stable link to documents that would be retained indefinitely and would be freely accessible to all, this became known as DERA – the Digital Education Resource Archive. The Resource is maintained and operated by the DERA Working Party which consists of six members of the Library Team, representing the Collection Development Services and the Technical Services departments.

DERA is a freely accessible online resource meaning that it has the potential to reach far beyond the users who had initially encountered the broken links in the IOE catalogue. The opportunities for increasing the awareness of the activities of the Library amongst this user base appear great, but DERA exists in an environment where it is competing with websites that provide similar services. In order to maximise the effectiveness of DERA as a resource, it is clear that a marketing plan is required. Interviews with the DERA Working Party confirmed that no such plan exists, but before the plan can be developed it is necessary to research and understand more about who the users – and potential users – of this resource are and what their needs might be. The research can therefore be situated in the marketing cycle illustrated in Figure 1.

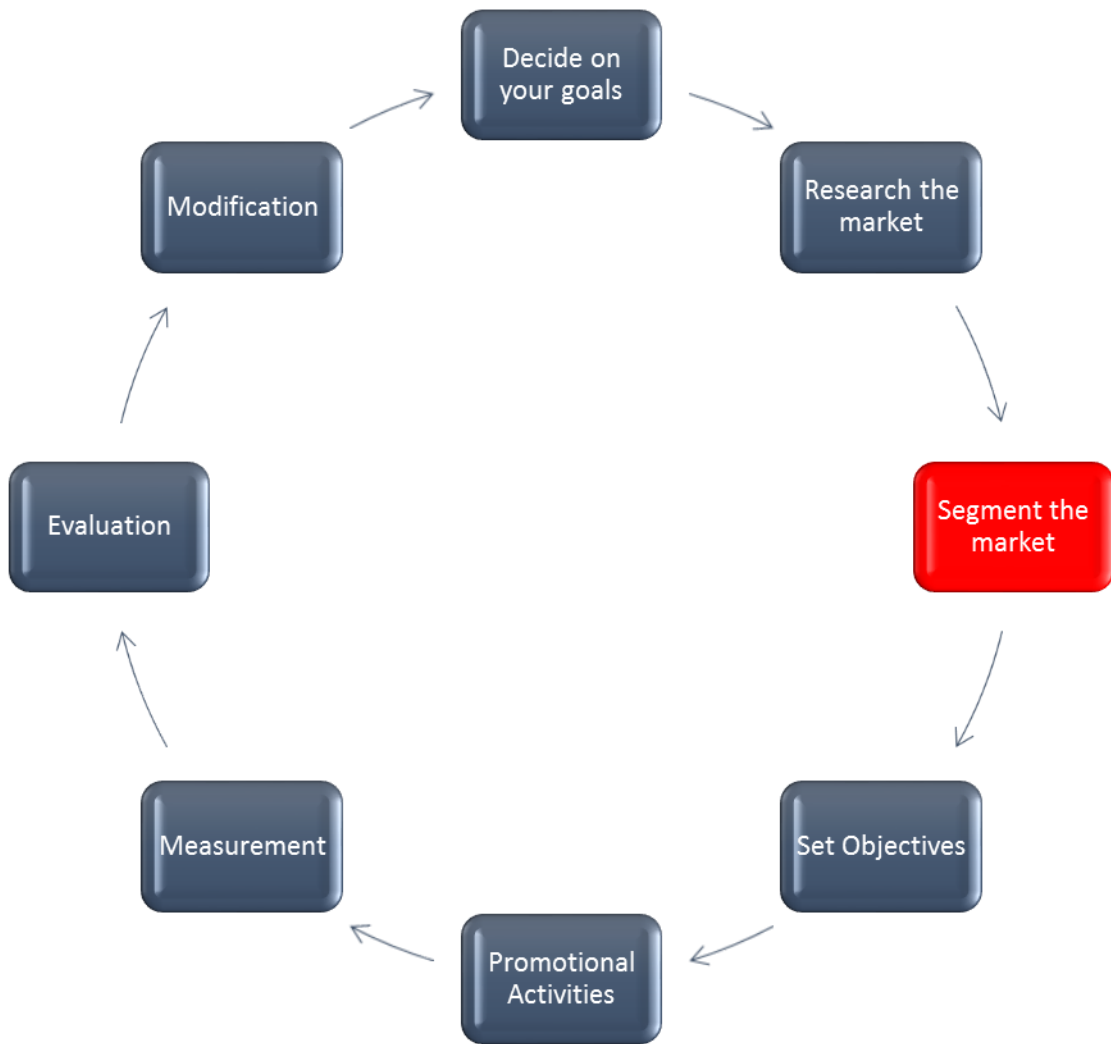


Figure 1: The marketing cycle. (Potter, 2012, p. 12)

Ultimately, it is the intention of this research to understand the extent to which the use of web analytics can contribute to the creation of viable and meaningful market segments for an open access digital resource such as DERA.

1.4. Research Questions

To achieve the aim and objectives of this study, this research poses three main questions:

- 1.4.1. How important has marketing been in the development of a strategy for DERA?
- 1.4.2. How is the market for DERA perceived by its developers?
- 1.4.3. Can web analytics be used to identify market segments which contribute towards a greater understanding of the market and thus increase usage and engagement?

These questions will be addressed using evidence from a literature review, semi-structured face-to-face and email interviews and data from a web analytics platform. In terms of structure, the next chapter outlines the approach and methodology for this research. Chapter 3 then presents the results and analysis; this includes a literature review and a summary of the interviews that took place for this study. Chapter 4 discusses the implications of the results in the light of previous research and the final chapter offers a conclusion that revisits the aims set out in this chapter and assesses the extent to which the research approach succeeded in achieving these aims.

Chapter 2: Research Methodology

2.1. Introduction

In order to answer the research questions outlined in section 1.4., a combination of approaches that used empirical qualitative data from library professionals and quantitative data from a web analytics platform was deployed. A literature review was used in order to define the current research landscape and helped to inform an understanding of the use of web analytics and market segmentation within the profession. Interviews were selected as an empirical research method on the basis that they might reveal information unavailable through a questionnaire or survey (Flick, 2014, p. 157) whilst also allowing the researcher to get close to the participants (Patton, 1990, p. 40). The data obtained was then used to inform the selection of quantitative data metrics from a web analytics platform which, once analysed, would highlight the possibilities and limitations of using web analytics to effectively segment the market for the DERA resource.

2.2. Justification of the approach selected

The Case Study approach allowed the specific situation of DERA to be studied in detail using multiple methods and data sources (Somekh & Lewin, 2011, p. 54). Although Case Studies are often viewed as being primarily qualitative in nature, it has been argued that it is still possible to include a significant quantitative element in this research approach (Yin, 2014, p. 19). This research follows the applied research and evaluation tradition (Somekh & Lewin, 2011, p. 55) - focusing on a particular problem faced by the IOE Library.

The timing, weighting and mixing of the research methods were a key consideration in the research design (Punch, 2014, p. 311) and the instrument-development variant of the exploratory approach was identified as being most closely aligned to the aims of this research (Creswell & Clark, 2007, p. 90):

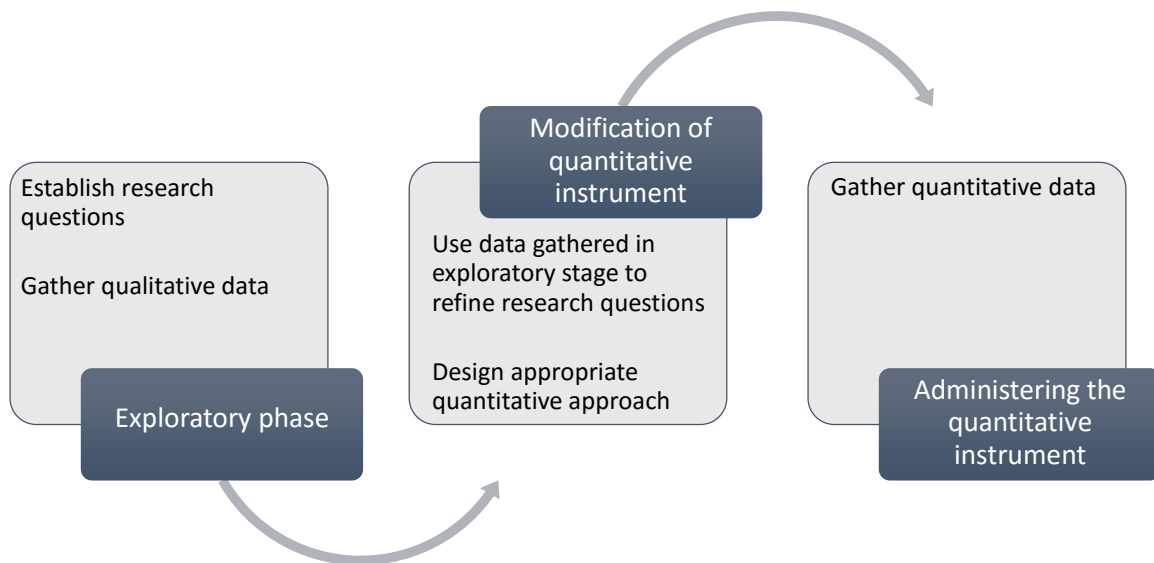


Figure 2: Illustration of instrument-development variant of exploratory research design.

The interface between the datasets was informative in nature (Guest, 2013, p. 47), with the information gathered in the literature review relating to the research questions outlined in 1.3. used to inform the interview enquiry process. The data

gathered from the interviews in turn informed the nature of the data collected during the quantitative web analytics activity as demonstrated in Figure 3.

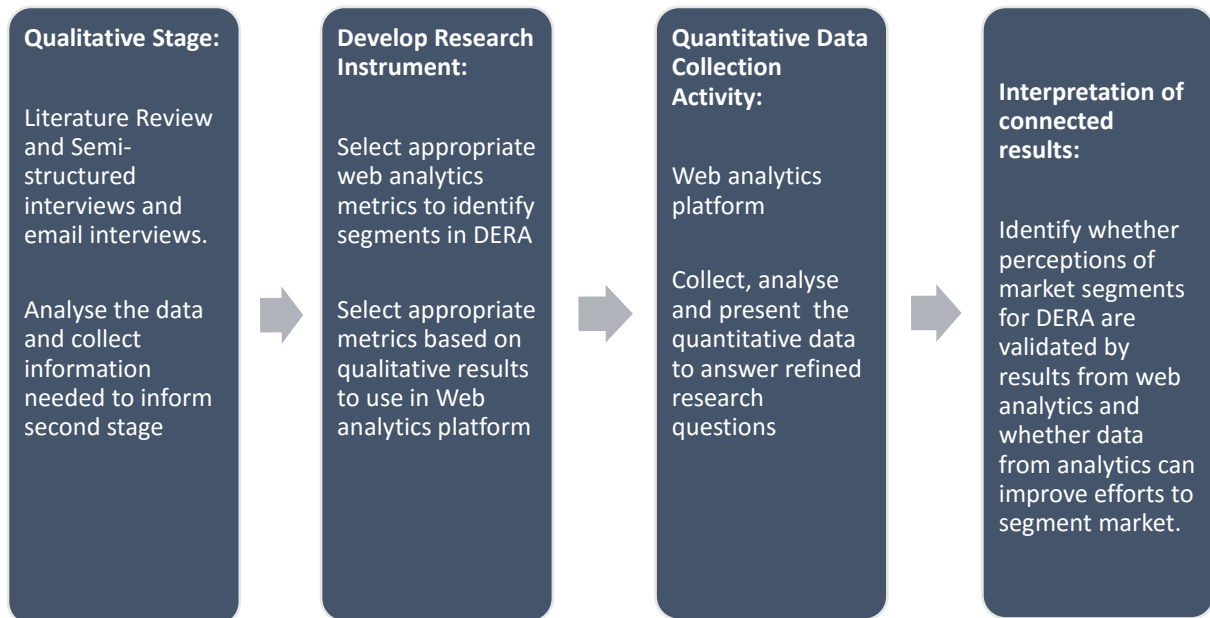


Figure 3: Implementation of research design

2.3. Methods

2.3.1. Literature Review – Approach and Method

The dissertation proposal process indicated that there was little literature specifically addressing the use of web analytics in market segmentation activities within the library and information services sector. Consequently a thematic review was undertaken, beginning to address the three research questions outlined in Section 1.4 and serving to provide an overview of the current research landscape and highlight potential ‘gaps’ in the literature. The review was based on a structure suggested by Punch (2014, p. 97) and was carried out between 18th June and 10th October 2014:

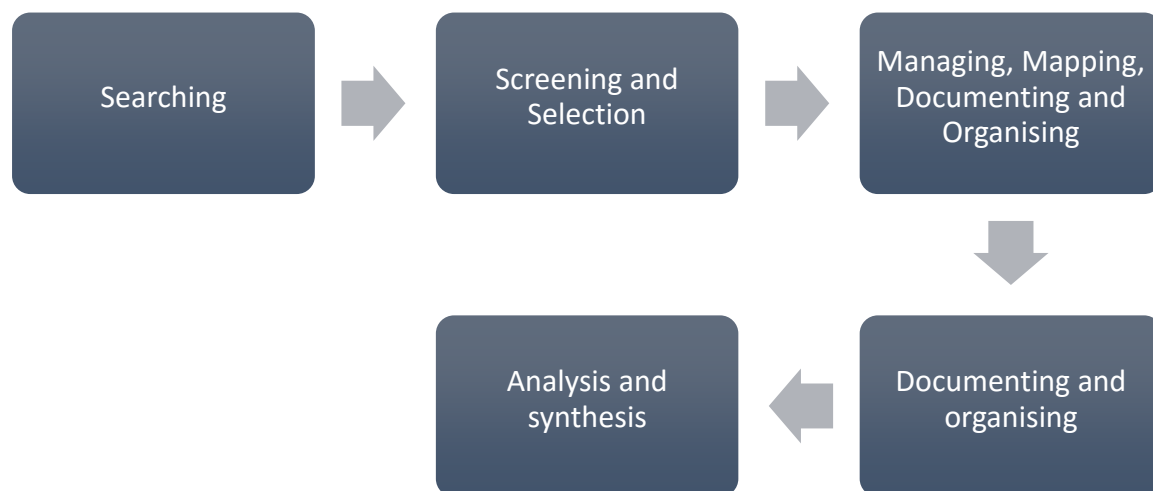


Figure 4: Approach to literature review

A preliminary survey of the literature began with an initial exploration of the terms, concepts and synonyms related to the topic shown in Figure 5. The terms of most direct relevance to the research were then combined.



Figure 5: Initial search terms

‘Wildcards’ were employed to ensure that singular and plural of terms were included in the results, for example substituting ‘librar*’ for ‘library’ and ‘repositor*’ for ‘repositories’

List of resources used for initial literature search
LISA (Library and Information Science Abstracts) database
LISTA (Library, Information Science and Technology Abstracts) database
Primo Discovery Layer for Aberystwyth University
Primo Discovery Layer for the Institute of Education
The British Library Main Catalogue
Google Scholar
EThOS (Electronic Theses Online Service)
Zetoc

Table 1: Resources used for initial literature search

The ‘related subjects’ functionality available in most of the resources listed in Table 1. were used to identify other search terms and concepts. These additional synonyms were recorded in a spreadsheet (Appendix 1.) and then transferred to

word cloud software in order to visualise key concepts (McNaught & Lam, 2010, p.630)



Figure 6: Wordle cloud illustrating related subject terms for “digital repositories” (See Appendix 2 for additional Wordle clouds)

A ‘snowballing’ approach (Jalali & Wohlin, 2012, p. 29) was adopted whereby references from the literature initially selected were also consulted, this process was assisted by the use of the Web of Knowledge Citation Reference Search and Google Scholar ‘Cited By’ functionalities. Weekly email subscription alerts and RSS feeds then maintained awareness of new literature. Search engines were used to locate practitioner oriented literature, grey literature, blogs and user guides.

The material was screened and selected according to three key criteria: (Denscombe, 2012, p. 58; Oliver, 2012, p. 61).

1. Authority: Peer review process and citation frequencies were considered. In the case of citation analysis this was not necessarily a reflection of quality (Clyde, 2006, p. 182) but at the very least highlighted influential works in the field.
2. Currency: The research area is a relatively new one meaning that much of the material was self-selecting
3. Balance: A balance in terms of source type that encompassed both empirical and theoretical approaches was sought (Punch, 2014, p. 95).

References were recorded on Endnote Web and a summary record sheet assisted in mapping the themes, arguments and data sources in the literature (Hart, 1998, pp. 148-149; Punch, 2014, p. 97).

2.3.2. Interviews: Approach and Method

The boundaries of this research outlined in section 2.1. meant that there was a focus upon the attitudes, perceptions and knowledge of DERA Working Party with regards to the research questions raised in this study. With regard to sampling for this stage of the research, a purposeful approach was adopted whereby the individuals selected for interview were adjudged to possess sufficient knowledge of the research theme (Brinkmann, 2015, p. 160). The members of the DERA Working Party interviewed were selected on the basis of their expertise and awareness regarding the development and operation of DERA, thereby yielding information based upon 'insights and in-depth understanding rather than empirical generalisations' (Patton, 2002, p.230).

Figure 7. (p.17) outlines the interview design and implementation adopted for this case study which was based on Kvale's seven stage model (Brinkmann, 2015, p. 129). The semi-structured interview method was selected because it allowed flexibility in terms of asking questions that would surface information directly relating to marketing and market segmentation in DERA in an environment that would also allow for more detailed discussion of salient issues as they emerged as well as allowing for the possibility of the emergence additional or unexpected areas of research that did not surface in the literature review (Brinkmann, 2015, p. 272; Flick, 2014, p. 197).

Whilst adopting the position of an 'insider academic researcher' (Brannick & Coghlan, 2007, p. 59) allowed natural access to the research subject (Alvesson, 2003, p. 174), there was a danger that issues of objectivity and distance would compromise the interview (Brannick & Coghlan, 2007, p. 72). However Brinkmann argued that the adoption of the confrontational interview technique made it possible to mitigate the implications of power relationships and organisational structure by offering elite interviewees an intellectual challenge, thereby creating a 'mutual and egalitarian relationship' (2015, p. 186). During the pilot interview, the confrontational

style proved to be an effective way of ensuring that the main research themes were discussed, however frequent reference to 'the literature' and 'theories' in the questions appeared to be influencing the direction of the responses. As a result, the structure and vocabulary used in the questions were altered in order to elicit a more natural response from interviews.

In order to triangulate the evidence gained from the interviews with members of the DERA Working Party, further empirical qualitative data was collected via an email interview with the workshop leaders of the JISC Netskills 'Getting the most from your Google Analytics' course offered to Library and Information Professionals. The use of an email interview techniques in qualitative enquiry has been justified as a valid research method especially with regard to the convenience it offers to the interviewees (Meho, 2006). In comparison to the face-to-face semi-structured interviews, the email interview format allowed less opportunity to explore or expand upon specific points (Somekh & Lewin, 2011, p. 151) but follow up emails did enable further clarification and exploration of answers. The interview structure was informed by the interview enquiry stages set out in Figure 7. and supplemented by email interview techniques outlined by Burns (2010) which included ensuring that there were not too many questions in the initial email, avoidance of over-generalisation and breaking up themes and topics into several questions.

Prior to the interviews taking place, a formal invitation to take part in the research interview and consent form were sent to the participants and these can be found along with the questions asked in Appendices 9,10 and 11.

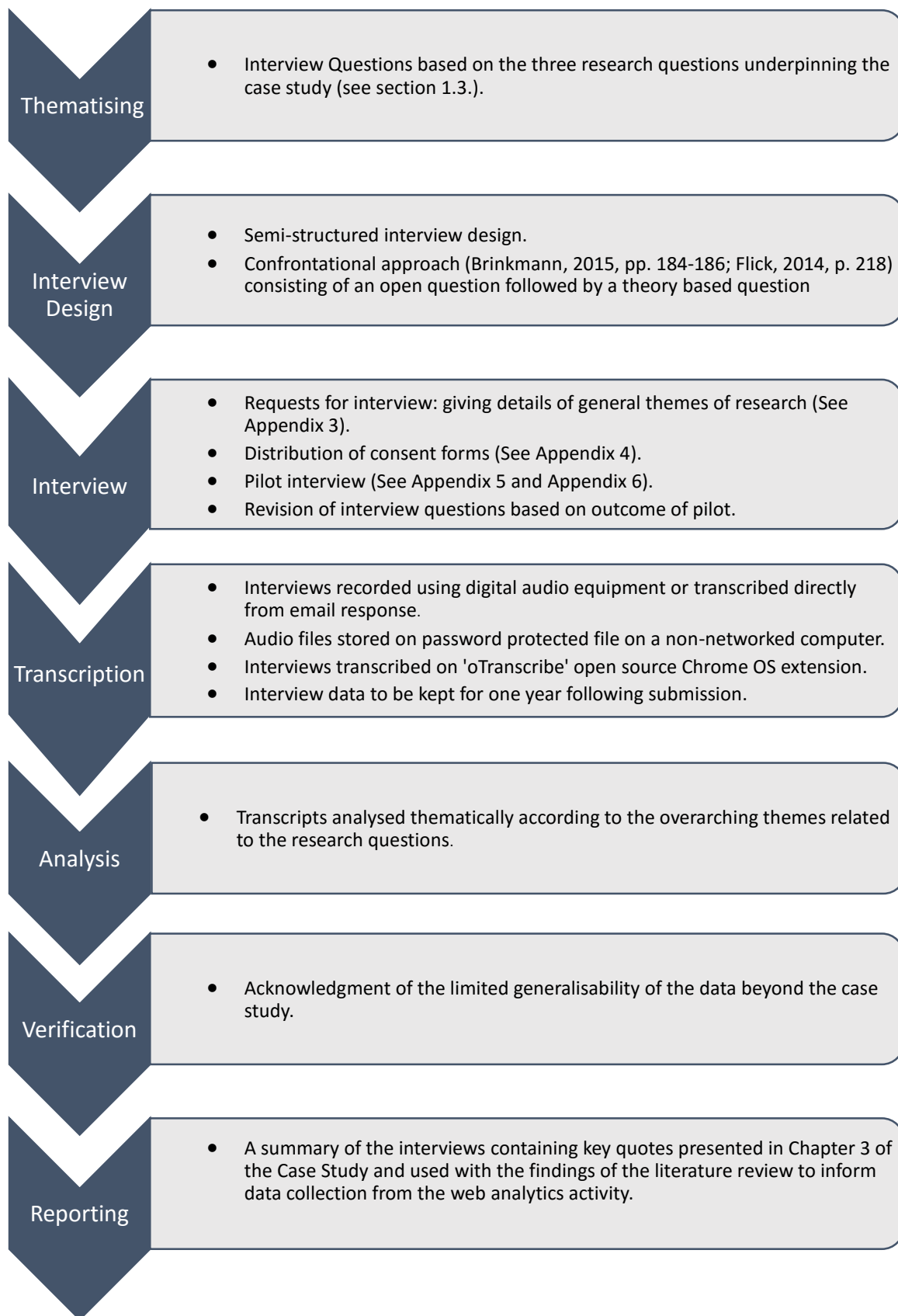


Figure 7: Interview enquiry stages

2.3.3. Web Analytics Research - Approach and method

Google Analytics was selected as the analytics platform to be used in this research. Google Analytics was already in use in the Library which meant that there was already data available to collect although this factor alone could not be used to justify the continued use of the platform. However, its popularity as a platform compared to competing services was compelling, with statistics showing that by December 2014 it held an 81.6% share of the market (W3Techs, 2014) (See Appendix 12). Although not necessarily a signifier of superiority in terms of ease of use and functionality, the popularity of Google Analytics provided a means that there was an active user community who could act as a knowledge base to which to turn for support. This included Google's own online training MOOC in the use of their software '*Digital Analytics Fundamentals*' (Google Analytics Academy, 2013). In addition Google Analytics is also the most heavily used platform in the sector (Yang & Perrin, 2014, p. 3), meaning that much of the literature related directly to Google Analytics. The selection of Google Analytics also enabled the researcher to attend relevant training courses provided by organisations within the profession such as 'Getting the most from your Google Analytics' provided by JISC Netskills.

One of the key decisions to make was whether or not to include the data from dera.ioe.uk that counted usage statistics from IOE Library Staff and Archives Staff computers. It could be argued that including the data from Library staff computers could be seen as a market segment itself, however much of this usage would include activity related to depositing material and maintenance of records. As a result it was decided that a more accurate reflection of the 'market' would come from the dataset that discounted data from IOE Library staff computers.

The model for reporting web analytics data for libraries suggested by Yang and Perrin (2014) was adopted and is outlined in Table 2:

Stage	Actions
Select time period covered	It was important to ensure that the data collected could be seen as representative. Consequently, 12 months of data was used as this enabled the ebbs and flows of the academic year to be accommodated.
Decide what to report on	Selection of metrics to illustrate different types of market segmentation. Informed by: <ol style="list-style-type: none"> <li data-bbox="906 618 1334 696">1. Data gleaned from the literature review. <li data-bbox="906 712 1302 790">2. Data from the interviews with Library Staff. <li data-bbox="906 806 1382 972">3. Limitations of the use of Google Analytics imposed by the data collection policies of the Library and the wider organisation.
Summarising data	Selected the appropriate means of displaying the data through the use of customised charts and tables and explanations of terminology in order to ensure that it was reader friendly.
Report	Provided analysis of the possible implications of the data as well as a 'custom dashboard' to be used to provide 'at a glance' information to inform strategy and development of the DERA resource.

Table 2: Model for selecting and reporting web analytics data

Figure 8. illustrates the default page of Google Analytics for the DERA website. This 'Audience Overview' page allows the user an at a glance summary of the audience for the website, displaying data for the number of visitors and page-views etc. The column on the left hand side of the page enables the user to drill-down for more detailed information on the site. This data is grouped into themed reports and sub reports. The building blocks of these reports consist of 'dimensions', - categories of the data being reported - and metrics – the numeric measurements of the events being reported:

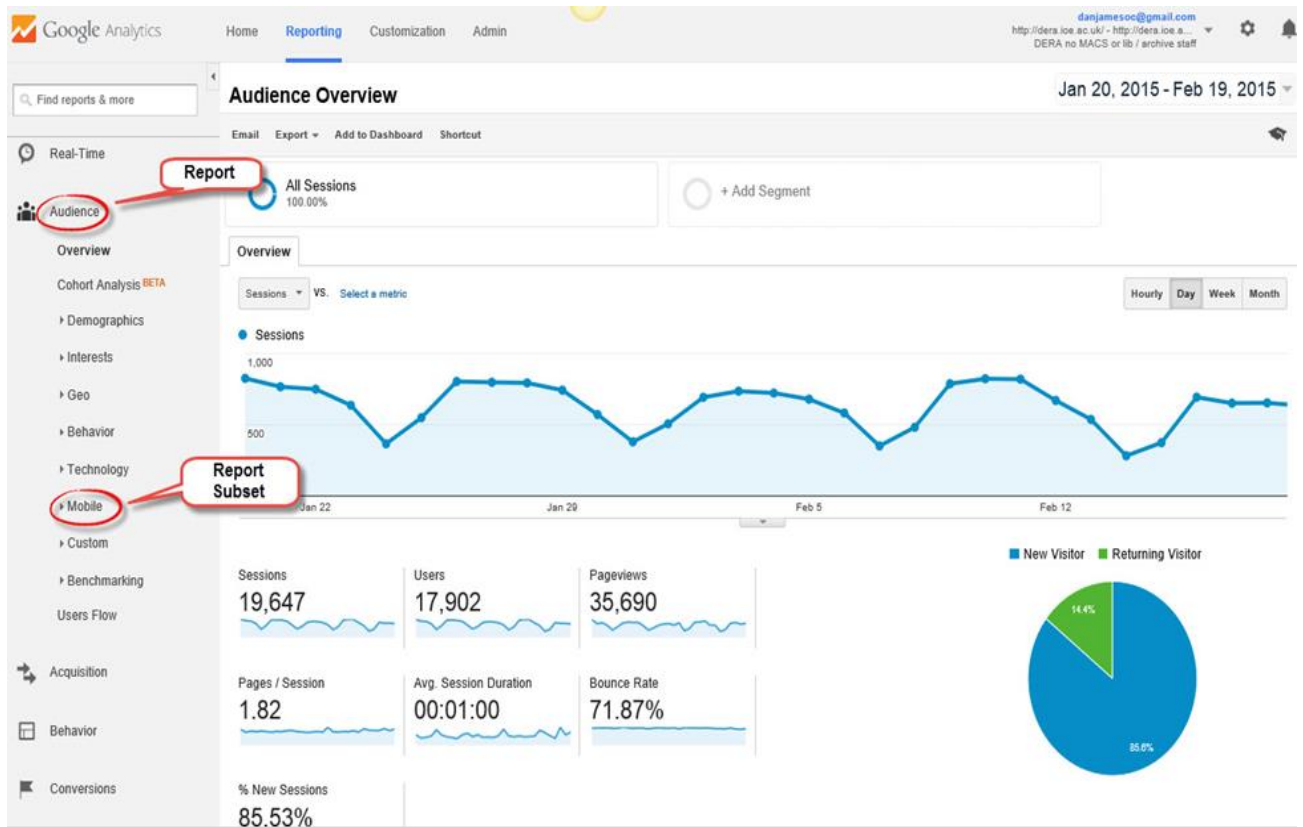


Figure 8: Default page for Google Analytics Reports

The availability of graphs, tables and charts appears to reflect an easy to use resource offering instantaneous insights (Farney & McHale, 2013, p. 5; Loftus, 2012, p. 54). However, the sheer amount of data available pointed to a need to select the metrics and dimensions to be used to segment the market carefully. Fang (2007, p. 5) in a previous case study on the use of web analytics in libraries used the 'Custom Dashboard' creation facility available in Google Analytics to bring the relevant metrics together on one screen. An example of a dashboard for DERA focusing on demographics can be seen in Figure 9:

Demographics for DERA

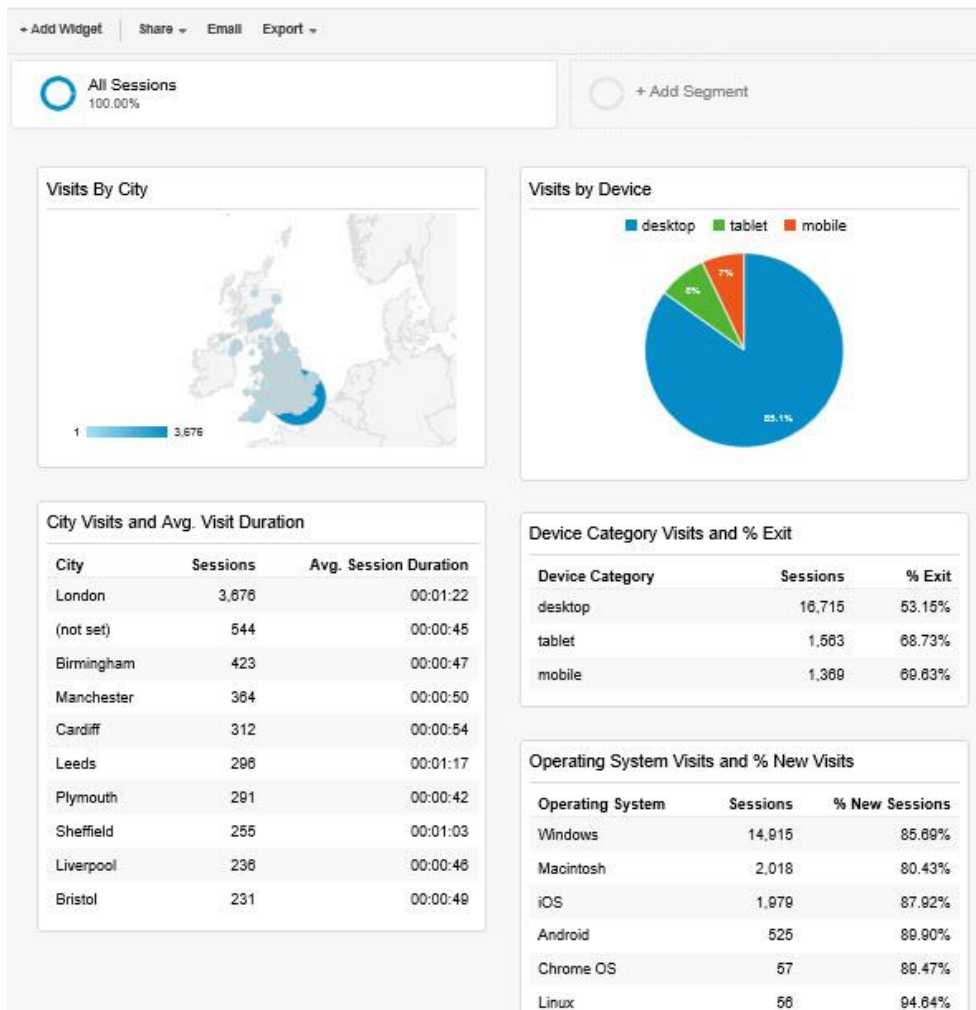


Figure 9: Custom demographics report for DERA.

This research exploits the dashboard functionality to provide data on various segments within the market of DERA users. Dashboards enable the production of key metrics for whatever role or task is being measured within an organisation, and can be customised to the audience (Ledford & Tyler, 2007 p.155). For example a senior management team might require a broad overview of trends and insights whereas a marketing team might require a dashboard and report that drills down into data that reflects the impact of specific marketing activities. Google Analytics data can be easily exported into other formats and these can be used to produce a report of recommended actions for each of the segments.

Chapter 3: Results and Analysis

3.1. Literature Review

This review was designed to surface the existing themes, knowledge and disputes related to the key research questions set out in Section 1.4

3.1.1. The Importance of Marketing in the Provision of Library Services

Libraries are in a position where they must communicate their value to users in an environment where the methods by which people access information has undergone a radical transformation. This task has been further complicated by the financial effects of the global economic downturn of 2007-8. The introduction of a UK Public Spending Review in 2010 which sought to ‘put Britain’s public services and welfare system on a sustainable long term footing’ (H.M. Treasury, 2010, p. 5) saw

‘Services which are widely supported as essential and widely used and valued across the socio-economic spectrum, such as libraries and sports/recreation... taking substantial cuts’

(Besemer & Bramley, 2012, p. 4)

Academic Libraries have not been immune to these threats, with researchers moving ‘beyond the library walls’ (Fry, 2006, p. 5) and facing the emergence of competition from search engines which provide ‘quick bites of information the way users want – fast and easy’ (Detlor & Lewis, 2006, p. 251). Search engine companies have the means to invest heavily in user-friendly front-ends and effective marketing strategies and Fisher, Pride and Miller (2006, p. vii) highlight the importance of effective marketing to challenge the perception of libraries as

'irrelevant relics' whilst Estall and Stephens (2011, p. 187) portray the marketplace as one where libraries have 'lost their position of supremacy over information access' resulting in 'a crisis of legitimacy.' (Ratzek, 2011, p. 139). The literature suggests that the survival of academic libraries is predicated upon a market-oriented outlook that understands the needs of users and differentiates itself from its competitors (Sen, 2006, p. 201)

Singh (2009, p. 25) argued that academic libraries have allowed a sense of complacency to build up due to a lack of competition on campus and referred to an 'attitude problem' towards marketing in the sector, with some senior managers not wishing to be associated with activities labelled as 'marketing'. Ramirez and Miller found that for some, marketing was regarded as an unnecessary activity (2011, p. 16). This is not an issue confined to libraries, for many outside of marketing departments the very term marketing' is seen as an 'ambiguous and mis-credited concept that is difficult to sell' (Grönroos, 2007, p.16). However, others counter that academic libraries are increasingly acknowledging the importance of an effective marketing strategy. Cheney (2007, p. 281) claimed that marketing has become an integral component of every library's day-to-day operations whilst Mallon (2013, p. 145) has argued that the economic landscape has resulted in a clear understanding of the need to defend the value of a library through the effective marketing of resources and services. These conflicting views can be seen to reveal a tension surrounding the concept of marketing which is perhaps only being resolved by financial necessity; faced with the challenges presented by new sources of competition there appears to be a move away from the sense that marketing activity in some way represents a commercialisation of information services that will result in 'the manipulation of users' (Kumbar, 2004).

With regard to the marketing of digital repositories, the literature suggests that they can be seen as a marketing tool in itself, 'reaching out beyond the campus walls and showcasing the capabilities of the library' (Drake, 2004, p.41). Ramirez and Miller (2011) in a study of varieties of marketing approaches adopted for digital

repositories, found that one organisation had no formal marketing plan, another marketed on an ad-hoc basis, and another ensured that a marketing strategy was embedded from the very start of the project. Importantly, in the context of DERA, their study demonstrated that whilst having a marketing strategy from the outset is preferable, it was argued that it was still possible to adopt a successful and coherent marketing approach even when the repository had matured.

3.1.2. Perceptions of the Market for Digital Resources

Traditionally marketing has been thought of in terms of the four 'p's - product, price, placement and promotion; however Grönroos regarded this model as 'a straightjacket' (1994, p. 9). Instead he portrayed marketing as a complex social process where relationships played the central role (Grönroos, 2007). Relationship marketing has been seen a concept that is vital for service industries in particular (Doyle, 2011), where taking a long term view of the interactions with customers is key to establishing 'mutually beneficial long term relationships' (Broady-Preston & Felice, 2006, p. 527):

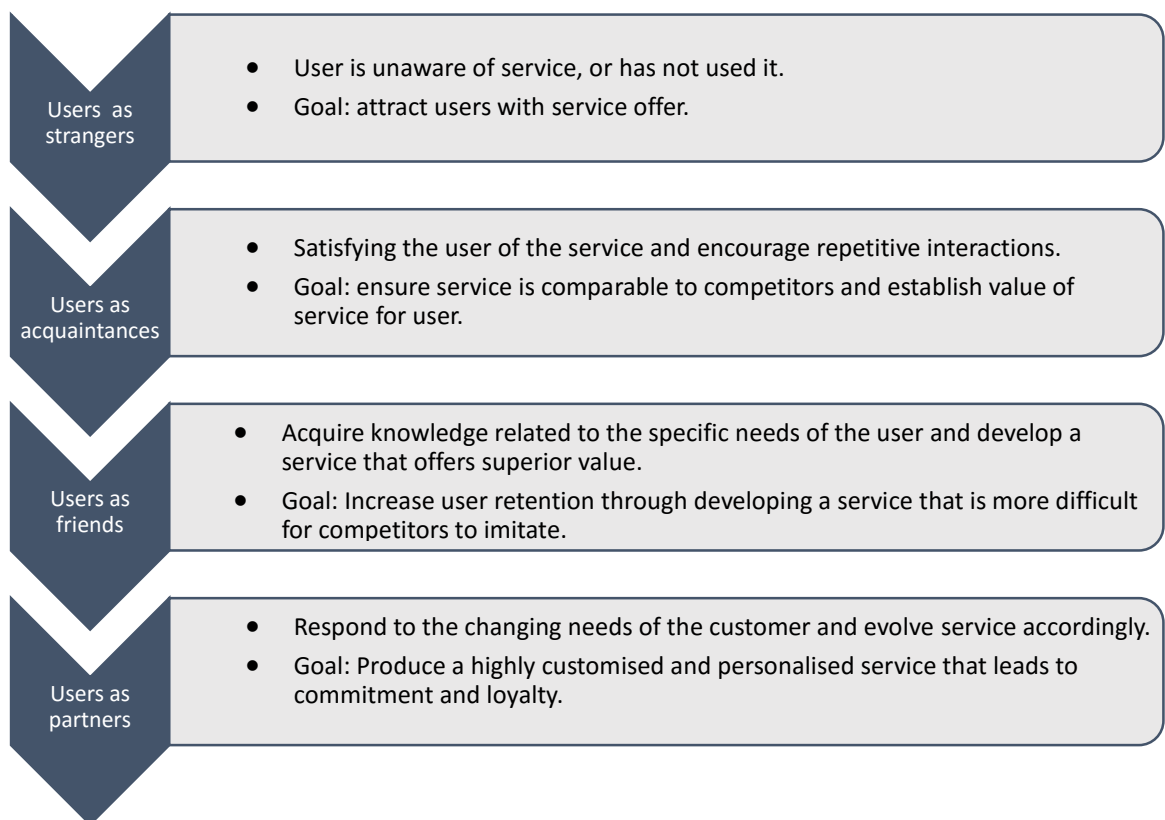


Figure 10: Relationship marketing model (adapted from Wilson, Zeithaml, Bitner, & Gremler, 2012)

The literature suggests that there needs to be an alteration in the way in which libraries define and perceive their relationships with their users and

stakeholders. In order to overcome the competitive threats outlined in the previous section it is clear that libraries can not assume that they know what is best for users and provide services based upon these assumptions (Cheney, 2007, p. 283). Instead, libraries must strive towards providing relevant and personalised services that 'reflect the experiences of the rest of their digital world' (Priestner & Tilley, 2012, p. 3).

Futterman (2008) argued that effective market segmentation challenged the tendency amongst service providers to deliver services to the segments that they already knew. This is especially important as sometimes these assumptions were misplaced and this resulted in services being poorly targeted (Warren, Hayes, & Gunter, 2001, p. 173). Germano has argued that services that have value to users can only be offered by first fully understanding their motivations and needs and using this knowledge to connect the services they offer to the wants of the user (2011, p. 104). In this light, the potential of using web analytics as a tool in building a productive relationship with its users becomes clear.

3.1.3. Can web analytics be used to identify market segments which contribute towards a greater understanding of the market and thus increase usage and engagement?

‘From recommendation engines, to blogs, to customized start pages, today’s ‘connected consumer’ navigates a landscape that is much more niche and personalized than we ever expected.’

(Friedman, 2007)

At first glance the consumer landscape described by Friedman creates a huge challenge for libraries in terms of engaging with users and marketing its services. However, by adopting a concentrated marketing approach whereby a service identifies parts of the market that it can serve best (Kotler & Armstrong, 1996, p. 384).

The literature indicates that segmentation has served as a valuable tool in the concentrated marketing approach, allowing libraries to gain an understanding of the motivations and requirements of niche groups and to then create differentiated strategies to send specific messages to these groups. (Brewerton & Tuersley, 2010; Ryan, 2014). With the economic constraints that libraries now face, segmentation enables scarce marketing resources to be targeted in a more efficient manner (Lee, 2004). However, segments are only of use if they themselves are cost effective, key criteria must be applied in order to test the viability of each segment and these criteria are illustrated in Figure 11:

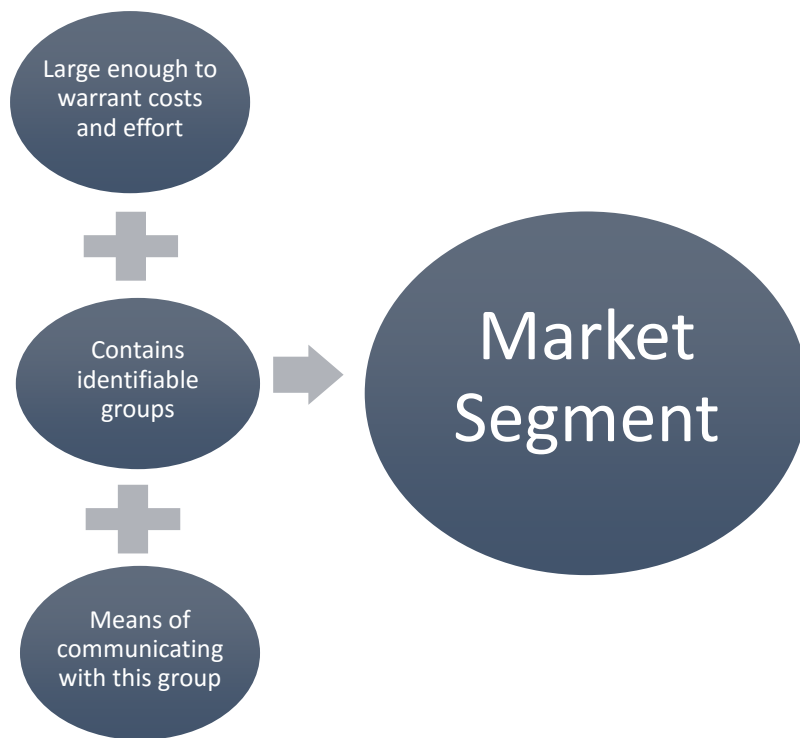


Figure 11. Key market segmentation variables (de Saez, 2002; Gierveld, 2006; Lee, 2004).

Various means of segmenting the market have been identified by researchers and these are summarised in Figure 12:

Geographic	Demographic	Geodemographic	Behavioural	Psychographic
<p>Relatively simple segments</p> <p>Exposes regional and national preferences</p>	<p>Divides market according to demographic variables.</p> <p>Includes variables such as age, income, occupation</p>	<p>Divides users according to where they live.</p> <p>Assumes that users living in a specific neighbourhood are likely to make similar choices and share similar aspirations</p>	<p>Differentiates according to usage patterns and usage rates</p> <p>Aims to attract non-users of services to become users and occasional users to become frequent users</p>	<p>Takes into account the personal, psychological and cultural factors that inform the behaviour of the service user</p>

Figure 12: Methods of Segmentation (Bryson, 2011; de Saez, 2002; Kotler & Armstrong, 1996)

Bryson (2006, p. 299) identifies demographics as one of the most popular methods of segmentation in information services mainly because it is the type of information that is often most readily available. However, it may be the case that the data available through web analytics enables a more nuanced approach that embraces one or more of the methods shown in Figure 12. For instance, returning to the concept of relationship marketing examined in Section 3.1.2. the question emerges as to whether web analytics might offer the data required to approach segmentation activities differently, perhaps allowing libraries to segment users according to the customer relationship expectations defined by Grönroos (in Wilson et al., 2012, paragraph 12):

- A transactional type where a user is looking for solutions to their needs at an acceptable cost and who do not wish to be contacted by the service provider in between transactions.
- An active relational type where a user is looking for opportunities to interact with the service provider to benefit from additional value
- A passive relational type who wishes to know there is the potential to contact the service provider if they wanted to.

The final part of this literature review now examines whether web analytics can offer this degree of insight into user segments.

White (2006, p. 9) has described how web commerce sites have evolved from simple 'brochure-ware' sites that were little different in nature to direct mail in terms of how they communicated a brand and services to more complex and interactive sites designed to engage, inform and retain customers. Web analytics software has been borne out of the practical need for businesses to understand the effectiveness of their marketing activity, situating analytics in the realm of the active practitioner rather than emerging because of the 'dictates of marketing theory' (Stuart, 2014, p. 19). Companies are now using web analysis to 'gather, infer, segment and track information' about users in a way that was not previously possible (Herold, 2010, p. 272), gaining 'almost instantaneous insights' into how customers react to a product (Loftus, 2012, p. 54).

Whilst being regarded as a 'relatively easy to use tool' (Farney & McHale, 2013, p. 5), one of the issues of using web analytics is the sheer volume of data available to the user. In addition, the terminology related to metrics used in Analytics, reports can be confusing unless users familiarize themselves with the meaning of the terms used (Yang & Perrin, 2014, p. 4). Practitioner based literature highlights the fact that effective use of web analytics is not just about the data collection itself, it is about how effectively the data is displayed to stakeholders (Google Analytics Academy, 2013). The balance of time needed to ensure that actionable insights result from the data is reflected in the 10/90 rule proposed by Kaushik (2006) who claimed that 10 per cent of the cost of using web analytics was in the set-up of the platform whilst 90 % of the cost could be attributed to the analysis and communication of the data.

In digital terms, web analytics are a mature product but the literature suggests that their use in libraries has been relatively recent (Manuel, Dearnley, & Walton, 2010, p. 69). The relative paucity of literature on the subject is viewed by Arendt & Wagner (2010, p. 38) as indicative of the sector continuing to see web analytics as something belonging to the commercial sphere. This links to Singh's (2009) suggestion of an 'attitude problem' to marketing within the sector. It appears however, that there is a growing realisation that web analytics can enable libraries to get to know users and make effective decisions about the provision of online services (Prom, 2011, p. 158; White, 2006, p. 17). This is evidenced by the increasing provision of CDP courses within the library profession containing a significant element of web analytics training such as the 'Getting the most out of your Google Analytics' training sessions run by Netskills (JISC, 2014).

Whilst metrics such as the number of users of a resource has traditionally been seen as measures of success, it is clear that the literature points to a need to seek out metrics which allow libraries to better understand the value and impact of the services they provide in relation to the changing needs of users (Showers, 2015, p. 42). The evidence suggests that libraries are increasingly aware of the need to understand the digital footprint left behind by our users, with Mitchell (2011, p. 68)

arguing that the insights gained from usage statistics could help to close the gap between how web software developers intend sites to be used and how users actually use them. Web analytics are seen as offering a multifaceted approach to examining user behaviour (Fang & Crawford, 2008; Prom, 2011), providing more accurate and relevant information than that provided by webserver logs (Turner, 2010, p. 267).

Although Web Analytics software is regarded as economical and easy to use (Arendt & Wagner, 2010; Fang & Crawford, 2008), some researchers argue that the reality is more complex. A survey of academic libraries found that 57.58% of those using Web analytics agreed or strongly agreed with the statement that there was a degree of uncertainty about how to use the data provided to make decisions about the library website (Manuel et al., 2010). Yang and Perrin argue that Library staff 'do not have the time to understand the significance of things such as "bounce rate" or "unique visitors"' (2014, p. 2). Libraries have also expressed concern about the lack control over these platforms and Arendt (2010) points out that the terms of service including pricing are often subject to significant change. In a worst case scenario the service might be removed altogether - as evidenced by Google's decision to remove the RSS Reader Service in 2013 as part of a rationalisation of its services (Holzle, 2013). Furthermore the data is collected and stored remotely by the platform provider and Farney and McHale (2013, p. 5) warn that these platforms cannot be seen as an 'infinite repository' for data.

The literature also indicates that privacy issues regarding the use of web analytics causes significant unease:

'As a general rule people, whether library staff or library users, do not like to be measured, and steps should be taken to show them the benefits of any measurement that is proposed'

(Stuart, 2014, p. 67)

Prom (2011, p. 165) suggests that it is good practice to formulate a formal privacy policy prior to using web analytics software and argues that it is important that the

policy is open and transparent and allows individual users to be aware of and easily disable any tracking activities.

The Literature Review also examined how other libraries and archive services had used web analytics in relation to the services they offered to users and this is summarised in Table 3:

Table 3: Case studies related to the use of web analytics in libraries and archive services

Location of Case Study	Key metrics and dimensions identified	What were the metrics used to measure or assess?	Source
Rutgers Newark Law Library	Connection Speed, Browser, Screen Resolution, Site Overlay, Visits, Return Visits, Visitor Segmentation, Page Popularity, Site Overlay, Navigation Summary	Site redesign and improvement User behaviour	(Fang, 2007)
Webjunction	Page Popularity, Page views per visit, Site Search, Traffic Sources, Unique Visits, Visits	Site Redesign and improvement User Behaviour	(Streams, 2011)
Wheaton College	Browser, Connection Speed, Page Popularity, Page views per visit, Screen Resolution, Site Search, Traffic Sources, Unique Visits, Visits, Bounce Rate, Length of Visit, Hardware Used	Use of staff time Assessing User Needs	(Malone, 2011)
Messenger Public Library	Page Popularity, Landing pages, Exit pages, Return Visits, Hardware Used	Site redesign and improvement	(Molaro, 2011)
The Health Sciences Library of the University of Minnesota	Visitor Segmentation, Page Popularity, Site Overlay, Site Search, Bounce Rate, Visits, Time On Page	Site redesign and improvement User Behaviour	(Loftus, 2012)
Ohio State University Website	Hardware Used, Length of Visit, Page Popularity, Time of Visit, Traffic Source	User Behaviour	(Black, 2009)
East Carolina University	Unique Page Views	Identify service priorities	(Custer, 2013)
Morris Library, Southern Illinois	Bounce Rate, Screen Resolution, Unique Visits, Navigation Summary, Page Popularity, Site Search, Visits, Time of Visit,	Site redesign and improvement Internal marketing	(Arendt & Wagner, 2010)
TTU Library	Page views, Unique Page Views, Time on Page, Bounce Rate, Exit Page, Traffic Sources,	Site redesign Service Improvement	(Barba, Cassidy, De Leon, & Williams, 2013)
University of Illinois Archives	Page Popularity, Site Search, Traffic Sources	Site redesign Improved customer relationships	(Prom, 2011)
Orang Asli Archive	Visitor Segmentation, Return Visits	Segment Users	(Herold, 2010)

Key Metrics Used In Case Studies

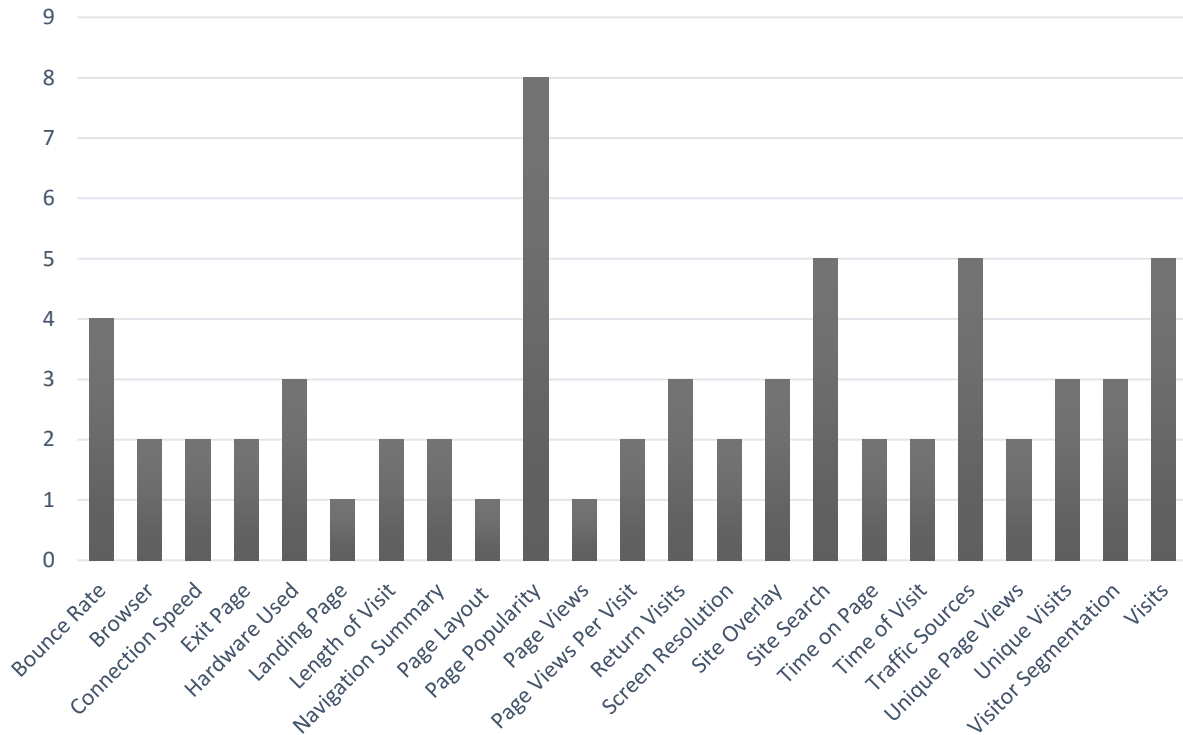


Figure 13: Metrics used in case studies during literature review

Figure 13. illustrates the metrics most often selected in the case studies conducted by Libraries and Archives: The number of different types of metrics demonstrates the depth of data to choose from and the continued use of page popularity and number of visits as popular metrics in measuring the effectiveness of sites can be interpreted as a relatively basic of use of the metrics available. Turner argued that a more ‘nuanced and effective approach’ (2010, p. 261) needs to be adopted, utilising other metrics such as ‘bounce rate’, ‘average time on site’ reports, and reports indicating the amount of new and returning visitors that when combined will contribute towards the greater understanding of the needs and motivations of the user.

Reasons for Use of Web Analytics

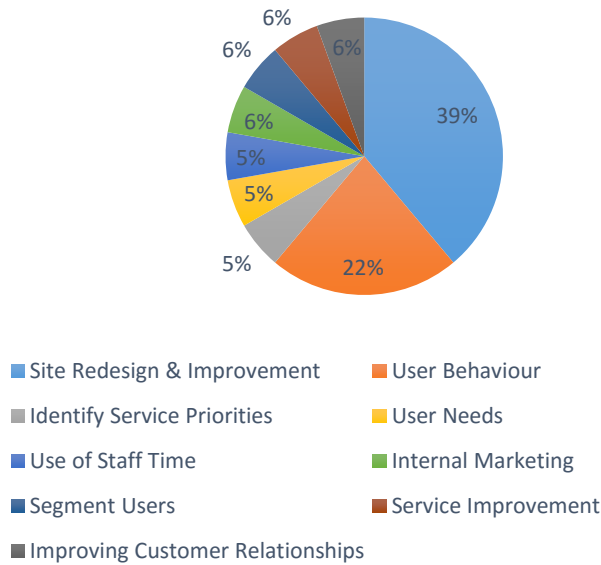


Figure 14: Reasons for use of web analytics in case studies

Figure 14. illustrates that in the case studies examined, web analytics were predominantly used to understand user behaviour or to inform site redesign and improvement in the case studies. In relation to the marketing cycle illustrated in the introduction to this research (Figure 1.), this case study can be seen to focus upon an earlier stage of the cycle, and this is illustrated in Figure 15 overleaf. Despite the difference in terms of where this case study sits in the marketing cycle, many of the metrics used in this study were similar to those used in previous case studies, and this emphasises the strength of Kaushik's argument that 90% of the work related to the use of web analytics can be attributed to the analysis required to generate meaningful insights related to the subject being assessed.

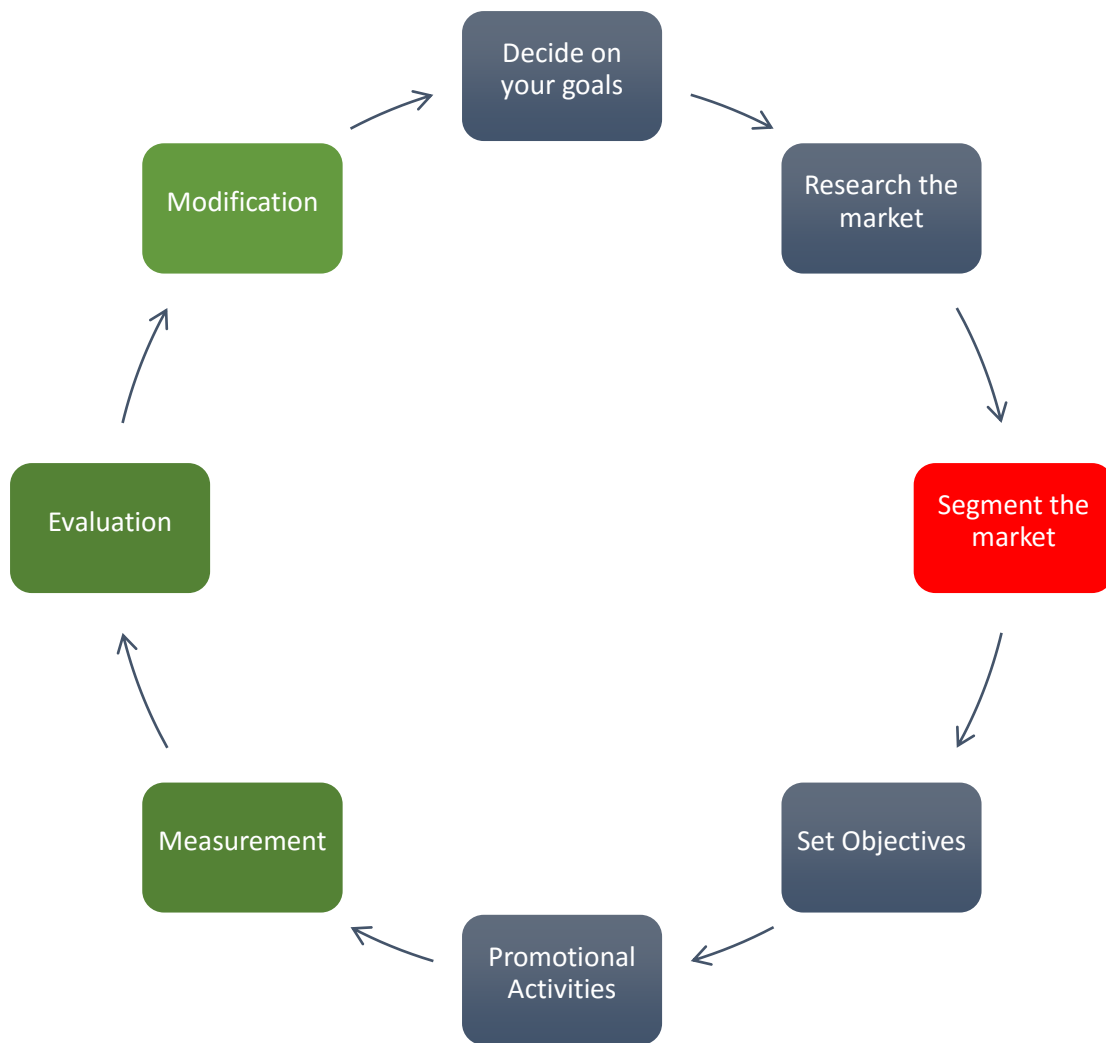


Figure 15. Comparison of previous Case Studies in relation to current research and the marketing cycle. (Red signifies current research, green signifies case studies in the literature) (Adapted from Potter, 2012, p. 12)

3.2 The Interviews

3.2.1. Interviews with the DERA Working Party

IS1 and IS2 are members of the DERA Working Party and have been working with the DERA repository since project planning for the project began in 2009 and its subsequent launch in 2011

Interview Time: Each interview lasted for 19 minutes

The importance of marketing in the development of a strategy for DERA

IS1 stated that marketing was not perceived as a priority in the planning and development of DERA:

‘The main driver was the preservation aspect and the collection aspect; the marketing, from my perspective, was secondary.’

IS1 ‘didn’t do marketing’ but thought that other members of the Working Party might have felt that marketing was an important element in the overall strategy. The interviewee felt that the project was driven by the ‘immediate need’ to close an ever increasing gap in the Library’s Official Publication Collection caused by the discovery of over 12000 broken links to online Government Publications. Despite ‘anecdotal’ evidence from users who were informing the Library about the issue, IS1 did not know whether there would be a market for the resource:

‘I just knew we had this problem with broken links and that the problem needed to be resolved...I had no clue [and] we did nothing to see what the demand would be.’

IS1 could recall some marketing activity, but this was characterised as part of a 'soft launch'; emails were sent to other academic libraries and other colleagues in the Working Party gave presentations to fellow information professionals at conferences.

IS1 stated that the Library could do a lot more in terms of marketing, especially in relation to the use of social media. In addition, the rapidly evolving nature of electronic library resources led IS1 to question the use of more traditional marketing materials such as flyers and posters:

'I can't get excited about print outs and things that go out of date...the screen grabs used are out of date five minutes later.'

The interviewee felt that marketing was something that 'doesn't come naturally to librarians' but that marketing was 'important' and 'vital'. However, the wish to develop more creative and effective marketing activities was seen to be hampered by a perceived organisational desire for a 'harmonised' identity across departments. It was felt that the development of a brand for the library would be made easier by involving other colleagues within the library team who were interested in marketing, especially those who had demonstrated an affinity and understanding of the effectiveness of social media in a personal capacity.

IS2 stated that, with hindsight, the DERA working party probably didn't pay enough attention to developing a marketing strategy prior to the launch of the resource. The 'key driver', was finding a way of addressing the situation where time and effort was being put into creating paper versions of an electronic document. The interviewee felt that despite the absence of a formal marketing strategy, the need to market the resource was

'always at the back of our mind...at an unspecified point...we would go out and do roadshows and things and we started compiling lists of things we would want to do.'

The interviewee stated that the innovative nature of DERA as a solution to a collection development problem resulted in a low key launch because 'there were so

many unknowns'. However IS2 pointed towards promotional activities within the library community consisting of emails sent to fellow education librarians. In addition, organisations who had given permission to store their material in the archive were notified of the launch of DERA.

IS2 felt that in general, the Library tended to market its services and resources in an 'ad hoc' manner and that it was a 'known issue that libraries and librarians don't shout enough about what we are doing'. Part of this was attributed to a perceived reluctance within Library teams to 'take the lead', stating that:

'There are the work and resource implications, all the teams are already doing our best, the best we can do, and for it to be done properly needs time invested in it.'

The importance of a dedicated marketing effort was reflected in IS2's desire for marketing activities to be established as a paid and recognised part of someone's role rather than being treated as an 'add-on'. The interviewee stated that individuals within the library have shown themselves to be adept at promoting what they do on a personal level and expressed a desire to 'tap into their expertise in a more systematic way'. The interviewee also perceived differences in the marketing strategy of the IOE as a whole compared to that of the library and felt that this led to a lack of a coherent message, it was felt that the Library Management Team would need to take active steps to resolve this issue.

How is the market for DERA perceived?

IS1 initially identified those who worked in the public sector or the charity sector as 'typical' users of DERA. Researchers were also acknowledged as a key demographic for DERA, particularly those interested in the history of education post 1990. These perceptions were based on anecdotal evidence informed by occasional feedback from users:

'We'll get comments from people in organisations that say 'I'm so glad that you have this resource.'

IS2 stated that due to technical and IPR issues had 'side-lined' efforts to find out more about the market and said that

'There are many different types of users, and this is an issue, because we don't know who they are and we haven't gone out there to try and find out.'

Reflecting further, it was suggested that the core users would be educational practitioners, researchers, and third sector users such as charities and schools. IS2 also suggested that students 'might stumble across it [DERA] on Google'. The interviewee also hoped that DERA, with the right marketing, could be seen a valuable resource amongst teachers, especially those in school leadership teams. Questioned about the evidence used to inform these market segments, IS2 pointed to the use of informal networks and conversations, as well as feedback from conference presentations.

Can web analytics contribute towards a greater understanding of the market and thus increase usage and engagement with the resource?

IS1 stated that Google Analytics were already used with DERA. However, the use of analytics was characterised as being 'crude' in nature, the main focus being on the number of visits per month. This data gathered was then compared with the usage statistics of other library resources such as the library catalogue and the institutional repository. The impact of the data was limited, only communicated 'occasionally' to the Library Management Team via email. IS1 referred to the Library Statistics Working Party, which had been tasked with looking at how statistics were being collected across the Library and identifying 'what we should be collecting, what they are for, and what impact they have'. However, it was noted that the Working Group had been in abeyance for over two years and the interviewee was keen to re-

launch the group in order to work out how to use the statistics available to the Library more effectively, stating that 'We've got loads of statistical information that we are not really using.'

The interviewee thought that it would be useful if web analytics could provide more data on the users of DERA. There was particular interest in finding out more about the sector in which they worked and then targeting marketing efforts based on the pages they looked at and the resources they downloaded. It was felt that the data available on users such as where they came from and the browser they were using wouldn't help to advance market intelligence significantly. In addition there was a perception that useful data on the market would be difficult to find and this was seen as a key reason for the current reliance on anecdotal evidence to inform knowledge of key market segments.

There was a discussion of the use of 'Demographics and Interest Reports' in Google Analytics in order to broaden knowledge of users of the DERA resource. This would involve enabling Google Analytics Display Advertising Features and could also necessitate an alteration of the privacy policy for DERA. In return this would provide the Library with more information on the age, interests and gender of users based on Google advertising cookies. The interviewee made reference to the existing cookie policy statement on the resource which was regarded as striking the correct balance with regard to informed consent and ensuring a good user experience. There was concern that a significant change in the privacy statement might impact upon that experience or act as a disincentive to continue to use the resource.

The interviewee questioned the necessity of collecting large amounts of demographic data from DERA users:

'If the analytics show most of our market are 50 year olds working in the public sector, how would we use it? Is that the information we need to market more effectively? I'm not sure, to be honest'

But then, the interviewee reconsidered the potential impact that this data might have and suggested that:

‘If we know of a particular profile, we might be able to design the website to speak to them.’

The interviewee also thought that there might be other ways of finding out about user users, initially suggesting pop-up surveys but discounting them due to the sense that users would find them both annoying and intrusive. Finally, IS1 questioned the use of web analytics purely as a marketing tool suggesting that they would serve a more useful purpose if they were used to identify problems with the usability of the site:

‘Are people understanding what the pages are showing? Are they easy to understand? Do they know what they are looking at?... [is it] easy to download?’

IS2 demonstrated awareness of the existing use of web analytics with DERA and thought that the data collected at present was mainly related to page views and geographical location. The most useful information that the interviewee would like to obtain from analytics was related to finding out which sector users worked in. In addition, the ability to measure how much of the material was accessed through social media platforms was seen as useful.

The interviewee raised concerns over whether users were aware that their behaviour on site was being ‘tracked’, but pointed out that most users probably assumed that this information was being collected on nearly every website they visited anyway. IS2 stated that libraries have tracked user’s behaviour for a long time, citing the example of the use of search logs in OPACs. The interviewee felt that users would probably trust those in the profession not to do anything ‘heinous’ with the information it held, but asserted the need for transparency:

‘We should be clear about what we are doing with the information, and people should know what we know about them’

Consequently IS2 expressed unease at the idea of enabling the 'Demographics and Interests' functionality within the Google Analytics platform which made them feel 'uneasy', pointing out that this level of tracking would feel like 'a very different ball game'. It was felt that collecting this level of information might be regarded as 'unethical'.

3.2.2 Analysis of Interviews with the DERA Working Party

It was clear in both interviews that marketing was not seen as a key strand in the development of the DERA resource, challenging the idea that it is an 'integral component of every library's day-to-day operations' (Cheney, 2007, p. 281). Indeed the approach characterised by Ramirez and Miller (2011, p. 26) as 'build it and they will come' appears more applicable. Despite the lack of a strategic approach, there was some marketing activity at the launch of DERA. More intensive marketing efforts were not made because the creation of the resource itself was seen as the key driver, consequently there was little understanding of what the demand for the resource might be.

The interviews provided little evidence of what Singh (2009) described as an 'attitude problem' towards marketing. Indeed, marketing was seen as being a very important element of library activity. Both interviewees felt that the Library should be doing more to market its services but were concerned about the impact upon workload and who would have responsibility for the role. There was a desire to engage with library professionals within the team who possessed marketing and training skills, reflecting the challenge for the sector as a whole where only a small percentage of those leading marketing activities in non-profit organisations have studied marketing to university level (Proust et al., 2013, p. 286). In addition, the perceived lack of a harmonised marketing message across departments emerged as a disincentive to engage in marketing activities.

The interviews illustrated that the interviewees do have perceptions related to who the key market segments for DERA are. Demographic segmentation was the preferred method of characterising users, with a tendency to describe users primarily by occupation. Researchers, teachers and those working in the public sector and charity sector were identified as important groups of users. However, the basis for this view of the market appears to be founded mainly upon anecdotal evidence built

up through occasional correspondence and feedback. Whilst this can be seen as having some value, the literature review has shown the dangers of using the information from this small group of 'known' users to make broader assumptions about market segments in general (Futterman, 2008). However, it could also be argued that the willingness of one of the interviewees to redesign elements of DERA based upon the behaviours and characteristics users - 'to speak to them' - indicates a more complex psychographic approach to the market in that it attempts to create a resource that addresses the personal, psychological and cultural factors that inform the users behaviour

The interviews showed that usage of web analytics in relation to DERA is limited, with the number of visits per month being the core metric. This mirrors the case studies cited in the literature review where page popularity and number of visits were found to be amongst the most commonly used metrics amongst libraries. Tellingly, one of the interviewees characterised the approach as being 'crude' echoing Turner (2010, p. 261) who suggests using a broader range of reports in order to ascertain a more rounded picture of user activity on a site. Furthermore, it is clear that the statistics obtained from the use of Google Analytics are not communicated regularly to the Library Management Team, nor to other members of the DERA Working Party, meaning that the data has no impact upon service provision. Given that effective use of the data from web analytics have been seen as a route to getting to know the users of online services (Prom, 2011, p. 158; White, 2006, p. 17), this would seem to be a missed opportunity.

Despite this, the interviews did reveal an acknowledgement that web analytics could be useful in determining segments of DERA users and it was felt that the knowledge gained could be used to market the resource in a more targeted and focused way. The amount and type of data collected emerged as a key issue, with some of the features available in web analytics causing concern, mirroring a study conducted by Educause in the United States, where it was found that students are sensitive to the barriers that exist between their personal and academic activities and

are suspicious of any personal data about them being 'leveraged' for academic use (Dahlstrom, Walker, & Dziuban, 2013, p. 32).

3.2.3. Web Analytics Training Providers: Interview and Analysis

As outlined in the methodology, an email interview was carried out with Christine Cahoon and George Munroe who facilitate Google Analytics Workshops for library and information services professionals as part of the JISC Netskills project. Firstly, the interviewees reflected the need surfaced in the literature review to utilise all the tools to the library to understand the wants and needs of its users in a competitive environment:

'It is in the library's interest to [use web analytics] if they have any commitment to remaining a viable service, monitoring expectations in order to satisfy their customers, who will serve as a 'critical influence' in securing ongoing funding from the public purse.'

With regard to the workshops that the interviewees facilitated, it was felt that although they equipped attendees with the basic knowledge required to use web analytics effectively, many seemed reluctant to 'venture outside their comfort zone' in terms of actively implementing a web analytics strategy when they returned to their workplaces. This was partly explained by barriers in actually deploying web analytics, with many professionals having restricted access to Content Management Systems which meant that the tracking codes required to capture data across library web sites could not be added. The interviewees felt that this issue was compounded by an apparent reluctance to seek assistance from fellow professionals and a lack of awareness of who best to seek assistance from. Lastly, where analytics were used, the interviewees felt that costs in staff time were underestimated, reflecting the 10/90 rule (Kaushik, 2006) where 90% of the effort, time and cost in creating actionable insights from web analytics comes from the time spent by people in extracting value from the data.

The interviewees argued that web analytics were useful in terms of marketing as they could be used to judge 'whether they are getting a good return on their investment' especially in measuring the effectiveness of user searches, the success

of social media activities and the impact of advertising campaigns. However, they argued that use of analytics would only prove effective if senior management ensured that agreed objectives created as a result of the data from analytics were achieved. It was pointed out that the limitations of the data collected needed to be acknowledged and 'an open means of communication with the market actors was necessary', which could be gained through the use of brief feedback forms on key pages.

The interviewees addressed the concerns expressed by the DERA Working Party interviewees regarding the use of reports' which required enabling Google Analytics Display Advertising functionalities in order to collect data. They regarded these only as a 'best estimate' which compromised the accuracy of the insights that could be drawn from them. With regard to privacy, the interviewees compared the level of intrusion caused by the use of CCTV cameras in the Library to that of the use of analytics, arguing that when web tracking activities are deployed the user of the resource is in control at all times and that definitive personal data could not be collected. Moreover, the interviewees viewed concerns over privacy as characteristic of the sector as a whole, claiming that 'Librarians often resist the collection of information about web site users via "cookies" and similar methods, regarding this as an invasion of privacy.' This echoes Stuart's (2014, p. 67) suggestion that more metrics are not collected in libraries due to a sense in the profession that users do not like to be measured (Stuart, 2014). Despite these concerns, web analytics were viewed by the interviewees as a non-intrusive way of collecting data that lead to the development of features that benefit the end user.

3.3. Selecting the Metrics

With reference to Figure 3: '*Implementation of Research Design*' (p.10), the qualitative data collected in the Literature Review and Interviews enabled the formation of a proposed model for the quantitative design instrument. At this stage in the case study, the focus shifted towards the last of the research questions in this case study related to the extent to which web analytics be used to identify market segments. Informed by Kaushik's outline of the four attributes of effective web analytics metrics (2010, p88) – that they be must be non-complex, relevant, timely and instantly useful, and supplemented by the data from the literature and interviews, it is possible to identify metrics which, when combined with the characteristics of a viable market segments produce a checklist of requirements for metrics required to segment the market for DERA (See Figure 17. overleaf):

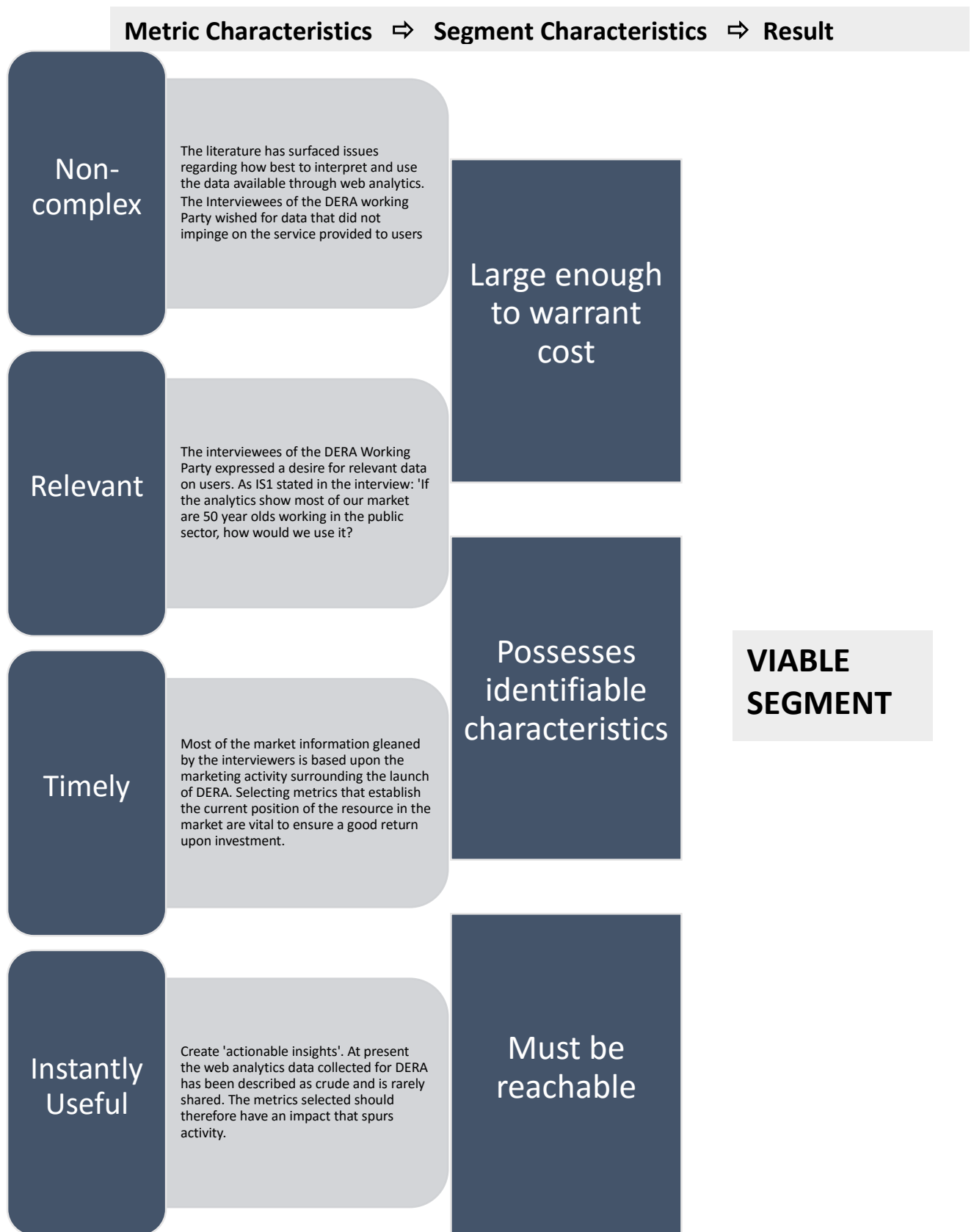


Figure 17: Model of metrics and attributes required to create viable market segments for DERA

3.4. Using Google Analytics to Segment the Market for DERA

The privacy issues raised in the interviews with the DERA Working Party meant that the 'Demographics and Interests' reports available via Google Analytics were not used to assist in creating a market segmentation model based upon simple demographic variables such as age, gender and interests. Moreover, the DERA Working Party seemed unconvinced of the merits of the value of this type of information and the interview with the JISC Netskills team highlighted issues with the accuracy of the data available in these reports owing to the 'guesswork involved behind the scenes'.

Attempts at other traditional methods of segmentation such as geographic segmentation were certainly possible through the use of data obtained from the 'Locations' section of 'Geography' sub-reports within the 'Audience' Reports. At first glance, and considering that DERA is an electronic archive of documents related to the UK, it is unsurprising that between December 22nd 2013 and December 21st 2014, 78.58% of sessions (131,111) originated in the United Kingdom.

Looking beyond the UK, users from outside of the UK could be considered as a market segment. A year on year comparison of sessions originating from countries outside the UK show significant increases in the amount of sessions as illustrated in Table 4:

	Sessions 2012-13	% of all sessions	Sessions 2013-14	% of all sessions	Year on year growth (%)
United Kingdom	114,168	80.47%	131,111	80.47%	14.84%
United States	3417	2.41%	5330	3.19%	55.98%
Australia	1996	1.41%	2970	1.78%	48.80%
India	1104	0.78%	1961	1.18%	77.63%
China	1165	0.82%	1730	1.04%	48.50%
Philippines	851	0.60%	1312	0.79%	54.17%
Canada	843	0.59%	1260	0.76%	49.47%
Ireland	866	0.61%	1016	0.61%	17.32%
Malaysia	613	0.43%	944	0.57%	54.00%
Germany	841	0.59%	926	0.55%	10.11%

Table 4: Year-on-year percentage increase in sessions by country 2012-13 to 2013-14

The high growth rates amongst this segment could be of potential interest to the DERA Working Party as they now represent 21.42% of users. Whilst this approach to segmentation could be considered useful - pointing in particular to the need to ensure that DERA is not simply perceived as useful to UK users - the information available is still somewhat crude. The data shows significant increases in usage but it cannot provide the reasons for this increase, thus pointing to the need to collect additional qualitative data from users.

Instead, two alternative approaches to segmentation of DERA users were adopted that encompassed more complex demographic, behavioural and

psychographic methods of segmentation whilst still using metrics that fulfilled the requirements of being non-complex, timely, relevant and useful:

- Segmentation of the market according to Digital Demographics
- Segmentation of the market according to User Experience and Engagement

Both of these approaches still include more basic dimensions such as the number of pageviews and the percentage of return visitors, and these are included in order to be able to allow a means of measuring the effectiveness of any marketing activity carried out within the segments.

3.4.1. Justification for Digital Demographics Segmentation

DERA is an online resource, and understanding the digital demography of users offers critical intelligence that will help to shape not only the marketing of the resource but also inform its future development. Data related to the digital demographics of DERA users were mainly located in the ‘Technology’ and ‘Mobile’ sub reports section of the ‘Audience Reports’

The experience of a resource can be dictated by the means by which the user accesses it. Digital resources behave differently across various types of web browser, sometimes displaying simple cosmetic differences or occasionally causing critical functional failures (Choudhary, Versee, & Orso, 2010, p. 1). Therefore insights related to the browsers utilised by DERA users could be seen as of significant value to the DERA Working Party:

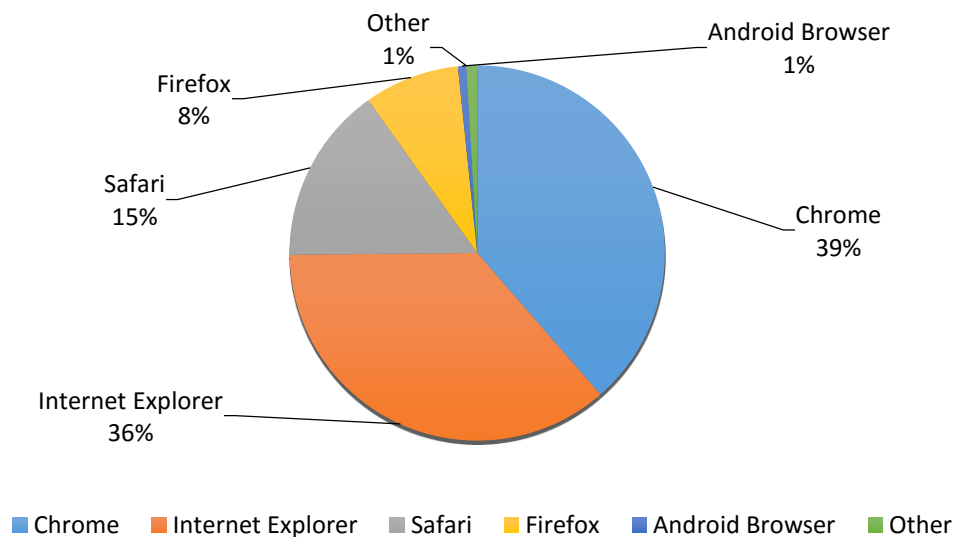
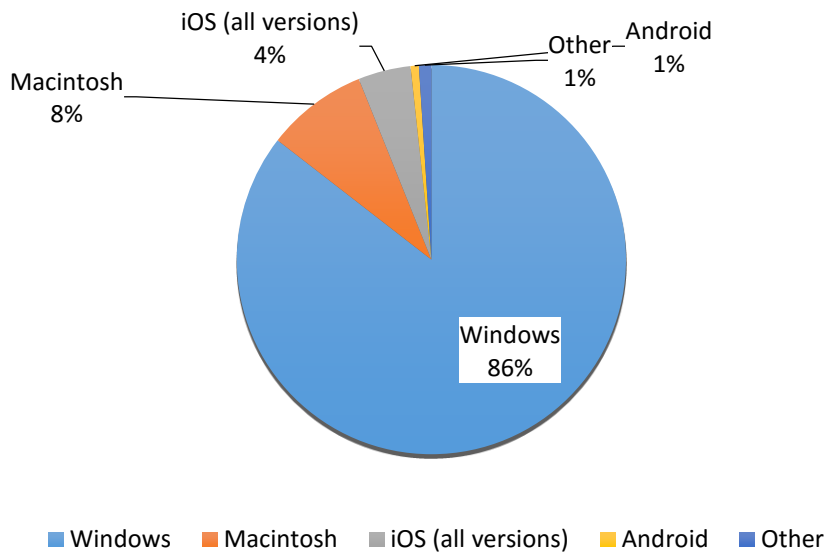


Figure 17: Browsers used to access DERA between November 22nd 2014 and December 21st 2014

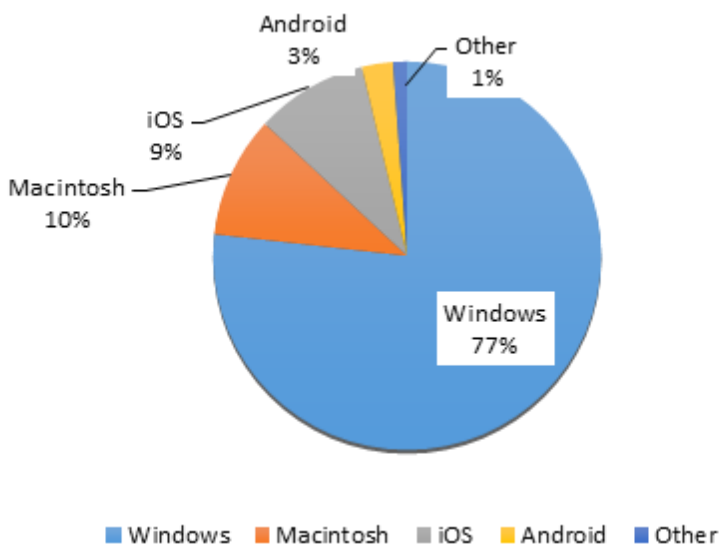
Yet this data alone is only of value if other metrics are associated with it are explored. For instance an examination of the bounce rate metric – defined by Google

Analytics as the percentage of single page visits where the user left without interacting with the page - could be used to indicate whether or not there might be an issue with a particular browser (Turner, 2010, p. 271). In the case of DERA, the average bounce rate for all browsers recorded in this data was 74.13%, but for mobile browsers such as Android the bounce rate rose to 86.13%. This could suggest that there might be issues of usability for users who are choosing to access the resource using phones or tablets.

This high bounce rate for the Android Browser prompted further investigation of the types of devices are used to access DERA. Real time information is available, but in this case the ability to use the data available over time proved most helpful. For example a the change in operating systems used to access DERA between 2011-2012 and 2013-14 can be used to demonstrate a significant drop in access via the Windows Operating Platform, as shown in Figure 18 overleaf:



Operating Systems used to access DERA 2011-2012



Operating Systems used to access DERA 2013-14

Figure 18: Changes in operating systems used to access DERA over time

Referring back to the concept of actionable insights, this data provides intelligence regarding the size of the markets who use mobile technologies which in turn could be used to inform the offer provided to users and consider ways of improving that

offer, for example by investigating the possibility of developing a DERA Mobile App or at the very least ensuring that DERA complies with mobile web standards.

Another key element of this demographic is the ability to understand the routes by which users arrive at DERA and this can be achieved by utilising data available through the Acquisitions Report:

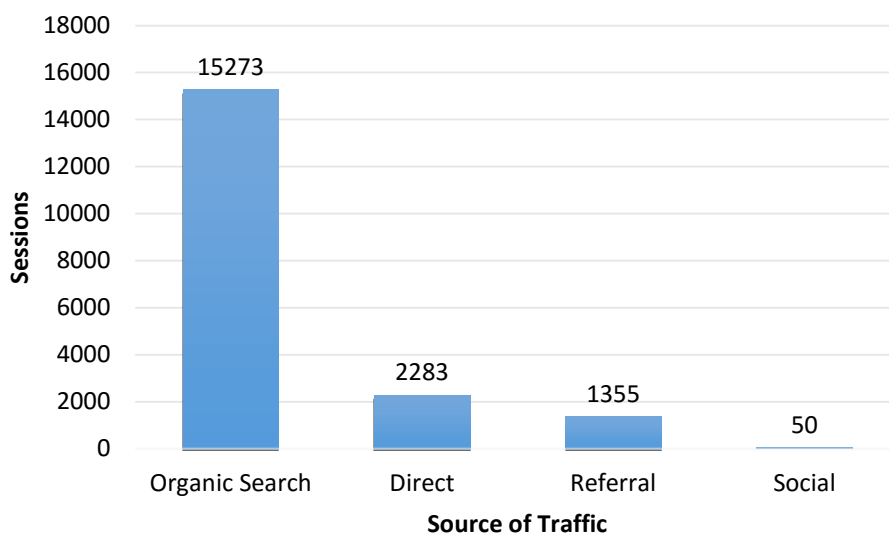


Figure 19: Sources of traffic to DERA resource: between November 22nd and December 21st 2014

The data appears to confirm the expressed by IS2 in the DERA Working Party that users ‘stumble upon’ the resource via search engines. The relatively small number of users who accessed DERA directly might be interpreted as an indication of a need to increase brand awareness, particularly amongst those who already utilise other resources provided by the library. Additionally the very small number of referrals to the site via social media methods illustrates the gulf between the acknowledgment of the importance of social media in the interviews with members of the DERA Working Party and the actual use of social media to market the resource. Lastly, the number of ‘referred’ visits, i.e. when a user has landed on site by clicking on a direct link to a

DERA resource from another website points to opportunities to build relationships with the referrers in order to increase traffic further.

In summary, a combination of dimensions and metrics could be used to build insights into the Digital Demographics of the user base:

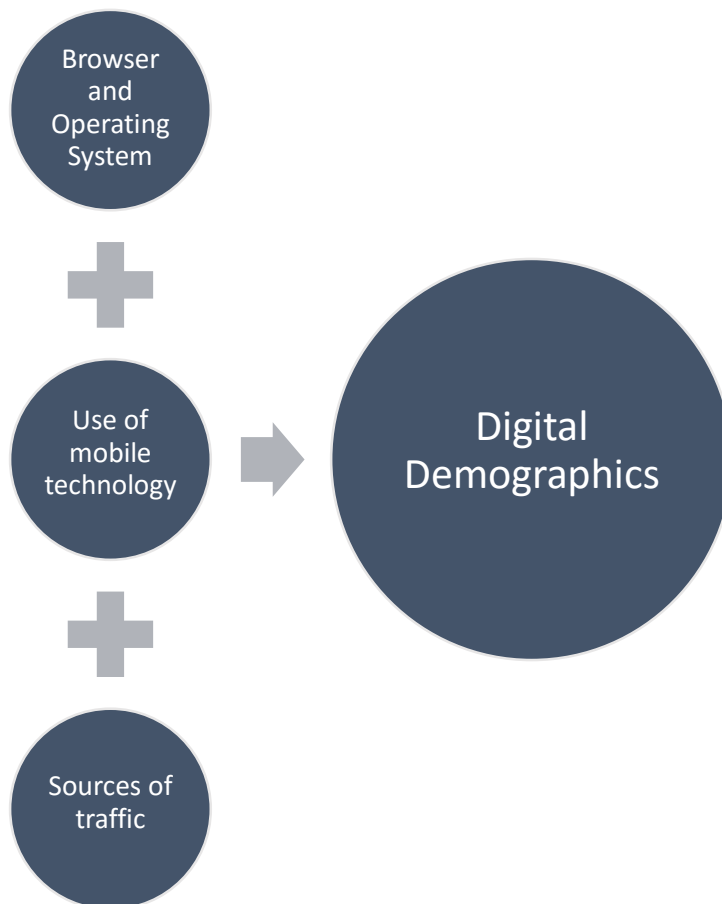


Figure 20: 'Digital Demographics' metrics and dimensions

The 'Digital Demographics Dashboard and Insights and Actions Report' in Appendix 13 demonstrates how this information could be presented to the Library Team to ensure that the data is used effectively as part of the planning and implementation of a marketing strategy for the resource.

3.4.2. Justification for Segmentation by User Experience and Engagement

This method of segmentation embraces behavioural and psychographic approaches and the concept of relationship marketing. In terms of understanding the level of user engagement with DERA and developing relationships whereby users are no longer ‘acquaintances’ but instead become ‘partners’ in the development of the resource, it is crucial that data is available that can contribute to answering the questions posited by IS1 of the DERA Working Party:

‘Are people understanding what the pages are showing? Are they easy to understand? Do they know what they are looking at?...[is it] easy to download?’

The bounce rate of users can be seen as an indicator of site design and navigational problems (Hasan, Morris, & Proberts, 2009, p. 703):

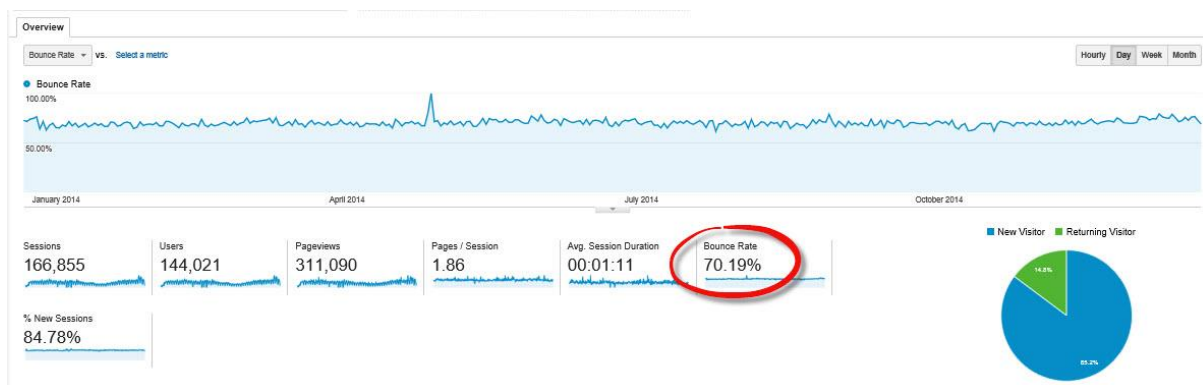


Figure 21: DERA bounce rate: December 2013-December 2014

The overall bounce rate for users of DERA between December 2013 and December 2014 stood at 70.19%. In terms of understanding the significance of the bounce rate for DERA, commercial web analytics practitioners regard anything over 40% as an indicator of issues with the design and navigability of a website (Anders Analytics, 2014). This information can be further contextualised through analysis of the

behaviours of users upon landing on the DERA home page using the 'In-Page Analytics Report' to examine what links users clicked:

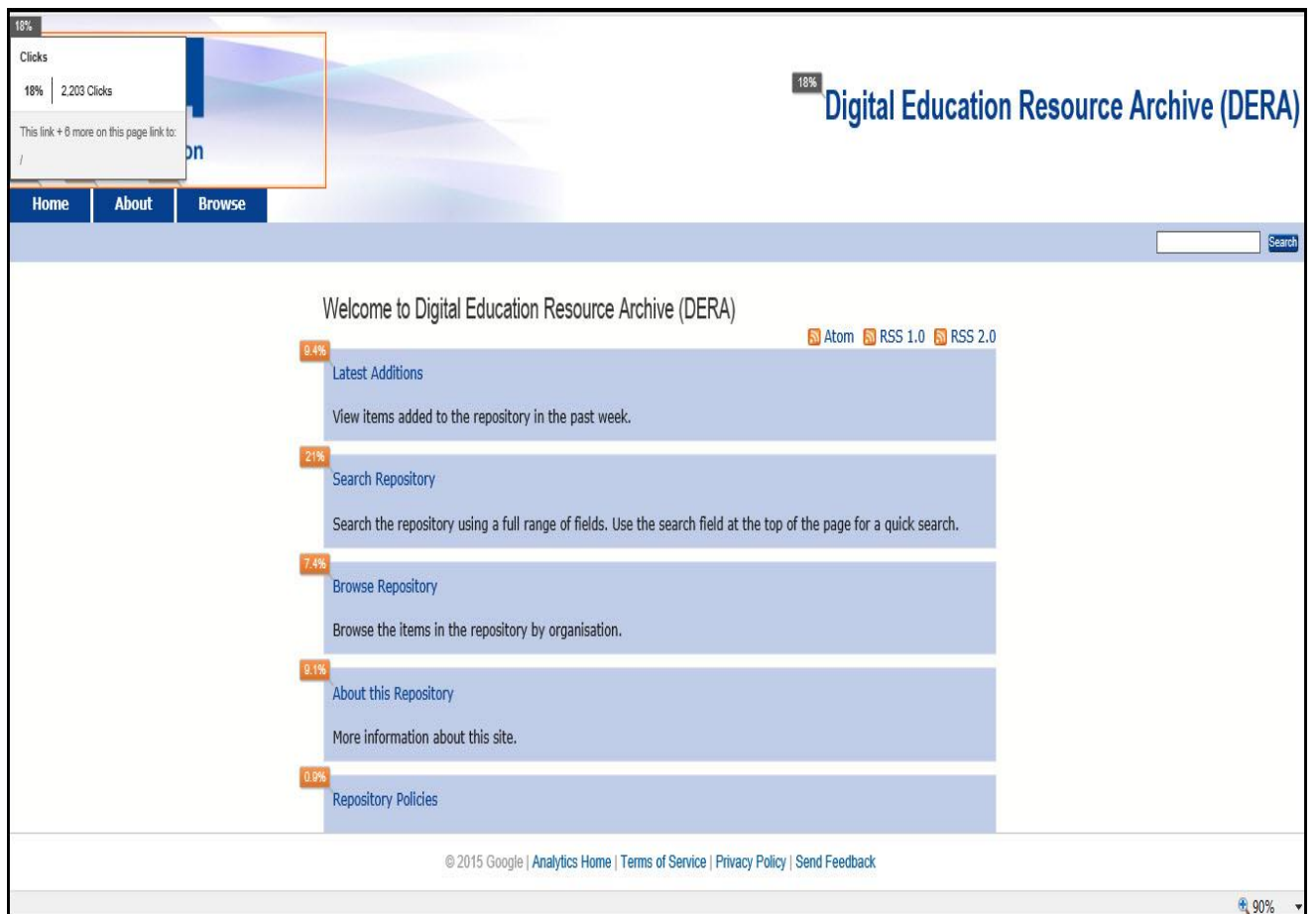


Figure 22: DERA in-page analytics report: December 2013-December 2014

In the case of the DERA home page, issues with site design and navigation are highlighted by fact that two of the links available on the home page simply loop the user to the home page again and account for 36% of the clicks on the page. This indicates a lack of clarity in terms of site navigation and could be a cause of frustration for the user, perhaps causing them to exit the resource.

The data available through the Behaviour Reports in Google Analytics can also be used understand the nature of the relationship that users have with DERA:

Landing Page Title	Sessions	% New Sessions	Bounce Rate	Pages / Session	Average Session Duration in seconds
DERA Home Page	11622	78.91%	49.54%	3.99	130.28
The use of computer and video games for learning	3046	90.02%	80.17%	1.35	22.75
The National Curriculum : level descriptions	2686	90.80%	89.58%	1.21	22.18
The P scales level descriptors	2091	87.47%	77.04%	1.38	29.74
The Bercow Report:	1470	87.35%	72.59%	1.43	62.29
The National Literacy Strategy	1433	83.18%	65.04%	1.93	112.58
Browse by Organisations: BECTA	1170	87.86%	67.61%	2.24	86.99
Teenage Pregnancy: Report by the Social Exclusion unit	1039	80.37%	67.08%	1.60	81.74
KEEP: key elements of effective practice.	1029	89.60%	77.26%	1.40	59.83
SET for success	987	90.37%	78.12%	1.42	65.09

Table 5: Most popular landing pages on DERA December 2013-December 2014

Table 5 suggests that, at present, DERA is a resource that is transactional in nature. The high rate of new users indicates that users look for one specific document and then leave. This seems to be confirmed by the bounce rate for users who landed on the DERA Home page (49.54%) compared to an average of 74.94% for the other pages which contained a specific document. This transactional approach to usage of the site can go some way then to explaining the relatively short time spent on the site by each user.

In summary, the DERA working party could use this User Experience and Engagement segmentation model to monitor their progress in transforming and marketing the DERA resource from one characterised by one-off transactional interactions into one which characterised by the willingness of users to explore and drill down into additional content. The success or otherwise of this transformation can be measured using the metrics and dimensions shown in Figure 23. and the User Experience and Engagement Dashboard and Report in Appendix 14 demonstrate how this information could be presented to the Library Team to ensure that the data is used effectively as part of the planning and implementation of a marketing strategy for the resource.

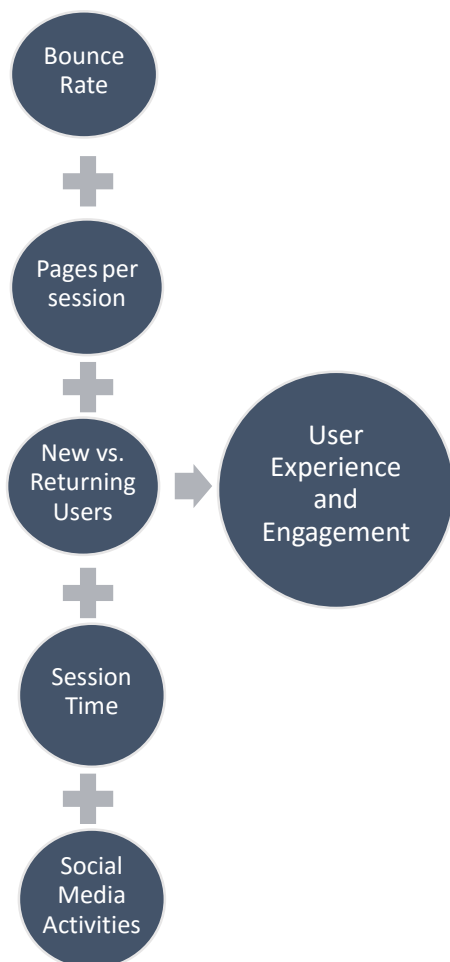


Figure 23: Metrics used to create a User Experience and Engagement mod

Chapter 4: Discussion of Results

The results of this Case Study indicate that web analytics data can be used to *contribute* towards an understanding of the market segments for DERA. It has been demonstrated that the data available from a web analytics platform can provide alternative ways of gaining an insight into the market, providing valuable information about the 'who', 'how', 'what' and 'when' of users' engagement with DERA. However, data obtained from web analytics does not answer the question as to why a user chooses to use DERA and this is important in terms of being able to engage with the market segments identified and to build a relationship with them. Macfadyn and Dawson (2012, p.149) have argued that 'the numbers are not enough' and Yang and Perrin point out that context must be given to the data: any inferences made about a segment will only be validated through direct engagement with the user in the form of surveys and questionnaires (2014, p. 407). Consequently, the use of web analytics as a market segmentation instrument can be seen as only one part of a suite of tools that need to be deployed in order to arrive at a full understanding of the market for DERA. The Custom Dashboards and Reports that have been produced in this Case Study should therefore be viewed as a basis for what Fagan (2014, p.25) refers to as a 'working hypotheses' which in turn can act as a springboard for further investigation and action.

The results also foreground significant issues with technical aspects of web analytics itself. Referring back to the Demographics and Interests Report available on Google Analytics, Christine Cahoon and George Munroe of the JISC Netskills Project regarded it as 'a best estimate' and cautioned on the validity of the insights that could be drawn from it. This idea of the data within web analytics being a 'best estimate' of user behaviour can justifiably be carried across to *all* metrics provided through web analytics. This is due to the reliance upon cookies to measure user interaction with the site. Concerns about identity theft and privacy breaches have altered attitudes to privacy (Krishnamurthy & Wills, 2009, p. 541) and users are increasingly using blocking programs and web browser settings to reject third party-

cookies (Lavin, 2006, p. 287). Consequently, the web analytics data for DERA can only be seen as representing those users who have not taken steps to disable cookies. This has important implications in the development of a relationship marketing approach with users of DERA. The high proportion of unique visitors to the site suggests that users are not returning to the resource, but if users regularly clear their cookies from their web browser software it is likely that the analytics platform is 'grossly overstating' the number of unique visitors to a site (Abraham, Meierhoefer, & Lipsman, 2007, p. 2).

Another technical issue that restricted the extent to which Web Analytics could be used to segment the market for DERA was due to the limitations of access to the content management system. DERA is hosted by the University of London Computer Centre rather than the Institute of Education itself. Whilst this enables cost savings in terms of server maintenance, development and technical support, it does limit the changes that members of the DERA Working Party can make to the site. This had a significant impact upon the dimensions and metrics that could be tracked. Firstly, data from site search logs was unavailable because the DERA Working Party lacked the necessary permissions to enable tracking of keywords and search terms. This limitation again serves as a barrier to developing relationships with users as it prevents the acquisition of insights into the specific needs of the user, expressed in the form of the search terms used, that would enable improvements to the resource.

The limitations over control of the site on which DERA is hosted also had implications in terms of measuring the impact of any changes and improvements made that are made to the site. DERA's raison d'être is to provide users a means by which to access and download PDF versions of official publications and counting each download of a PDF could be seen as a possible indicator of the success of the resource. This could be measured in Google Analytics by setting up a 'Conversion Rate' report which would measure the number of downloads of PDF files divided by the number of unique visitors. Conversion Rates are regarded as one of the most important parts of web analytics implementation yet although Google Analytics can indicate when a page that hosts a particular PDF is visited, it cannot automatically

indicate whether the PDF itself was downloaded successfully by the user. There are simple third party Javascript download trackers that can be added to Google Analytics such as Entourage.js, but again it was not possible for the DERA Working Party to add this extension because it does not directly administer the website that hosts the resource.

The technical limitations explored here can be seen to relate to a wider issue concerning the perceived ease of use of web analytics. Google Analytics has been described as easy to use (Fang & Crawford, 2008; Farney & McHale, 2013). However, the realities of creating and effectively deploying a Google Analytics Account, involving as it does, the creation of the profile for the website to be tracked, embedding the automatically generated tracking code into the HTML code of the website pages, and then finding and analysing the appropriate metrics to create insights into the resource requires a significant commitment in terms of time, training, implementation and monitoring. The difference between the perceived ease of use and the actualities of using web analytics effectively might contribute towards understanding why web analytics were only being used to measure broad usage statistics such as page visits in DERA prior to this research. The gap between the perceived ease of use and the realities of implementation of a web analytics platform might also provide an explanation for the apparent reluctance of library professionals to seek assistance with issues related to the use of web analytics.

Perhaps the key outcome of this case study is the potential utility of the customisable dashboards. These can be used to display the most important metrics in a compelling way, allowing the account holder to utilise a variety of display techniques ranging from graphs and tables to pie charts. The dashboards serve to untangle the huge amounts of data available to the team, enabling a focus upon the key metrics and dimensions. With the literature demonstrating that libraries in general have found it difficult to make use of the data available in web analytics, the use of custom dashboards has the potential to serve as a key tool in driving change and improvement within the service and can be seen as a persuasive and impactful way communicating the most relevant messages across the whole team, including

the senior management team. Moreover, these dashboards are not limited to serving as a tool in segmenting the market. The dashboards and reports could be designed to reflect the impact of individual marketing campaigns, measure the effectiveness of social media strategy, or monitor the effect of improvements made to the functionality of the resource.

Chapter 5: Conclusion

The overall aim of this research was to contribute towards an understanding of the role of web analytics in identifying key market segments for an open access repository. The necessity for such research was summarised by one of the members of the DERA Working Party:

‘There are many different types of users, and this is an issue, because we don’t know who they are and we haven’t gone out there to try and find out’

IS2

Adopting an the instrument-development variant of the exploratory approach (Creswell & Clark, 2007, p. 90), this Case Study built upon the results of qualitative data obtained from the literature review and interviews to inform the selection of appropriate quantitative metrics for use in Google Analytics in order to create viable market segments. In turn, this data was used to create a suggested model for reporting, analysing and recommending actions through the use of Custom Dashboards and Reports (Appendices 13 and 14). This concluding chapter will now revisit the objectives set out in the Introduction and discuss them in the light of the results of the case study:

1 Investigate the attitudes of those working with a digital repository towards marketing.

The research process has highlighted conflicting attitudes within the DERA Working Party towards marketing. Whilst marketing was regarded as important, no marketing plan featured in the overarching strategy for DERA and any marketing activity was conducted on an ad hoc basis. Other digital repositories in the sector have adopted a variety of approaches to marketing with some having no marketing strategy at all, others adopting a similar ad hoc approach to the DERA Working Party and others having a marketing strategy embedded from the start of the project (Ramirez & Miller, 2011). This

variance in attitudes and approaches can be seen to be indicative of the complex and at times contradictory relationship that the sector as a whole appears to have with marketing: The literature and interviews reveal an acknowledgement that in a competitive environment it is absolutely vital to communicate the value of the resources provided by the sector (Cheney, 2007; Mallon, 2013), yet there still appears to be a degree of reticence associated with activities that appear far removed from traditional views of the core functions of a library (Kumbar, 2004; Ramirez & Miller, 2011; Singh, 2009). In the case of the IOE Library, the main contributing factors to the lack of marketing activity are the additional resources in terms of staff, time and management combined with a failure to utilise the marketing skills that may already exist amongst the workforce especially in with regards to communicating with users via social media. This is vitally important as social media plays a key role in terms of communicating with users of an online resource and using this communication to build a 'community of active and engaged users' (Burkhardt, p.12).

2. Outline the importance of market segmentation in effective marketing.

Market segmentation is a pivotal stage in the marketing cycle (See figure 1, p11). The ability to define identifiable and discrete groups of users can be seen to facilitate the adoption of differentiated strategies that can be employed to ensure that specific marketing messages can be sent to these groups. This approach could assist in successfully transitioning the resource from one that is viewed by the user as transactional in nature to a resource where the user takes the opportunity to interact with the resource providers in order to obtain added value.

3. Identify existing perceptions of users of a digital repository amongst Library and Information Professionals

The interviews with the DERA Working Party indicated that market segments were still perceived in terms of simple demographics – with the users' occupation being the key focus. The actual knowledge of segments was based on occasional user feedback and informal conversations but there had been no concerted effort to systematically gather the evidence required to understand the make-up of the market for the resource. At present the DERA Working Party appear to base their perceptions of the market on who they think might use the resource, or who they think they would like to use the resource rather than any empirical data.

4. Investigate the existing use of commercially available web analytics software within the library and information sector and identify the most appropriate software platform(s) for this research

The majority of previous case studies suggested that the prime reason for web analytics use was related to website design and understanding user behaviour on library websites. However, both the literature and the interviews with the DERA Working Party revealed that usage is still relatively crude and the apparent lack of exploitation of the full range of data available can be attributed to the fact that although web analytics interfaces appear to be user friendly, it requires the development of specific skills and knowledge to identify and utilise appropriate metrics effectively.

It has also become apparent in this case study that there is scope to consider challenging the dominance of the Google Analytics platform within the sector. Concerns raised by the DERA Working Party interviewees over the control and ownership of the data combined with technical issues related to accessing all of the data required suggest that Google Analytics may not be

the platform best suited to DERA. This points to the value of further research into platforms that are more closely aligned to the needs of the Library. For example Kärberg (2014, p.137) argues that the Piwik web analytics platform has important advantages over Google Analytics in the Libraries and Archives sector as it is installed onto the host server meaning that the organisation owns and controls all data and is able to set its own privacy policies.

5. Select the most useful data available from web analytics to determine viable market segments

Web analytics provided the opportunity to explore a variety of ways of segmenting the market. The segmentation model developed in the case study was informed by the key characteristics of a viable market segment – being large enough to warrant the cost of marketing, having identifiable characteristics and being reachable - combined with the key characteristics of effective web analytics metrics – being none non-complex, relevant, timely and instantly useful. Segmentation models based on digital demographics and user experience and engagement were developed for this case study, but there is the potential to develop further models depending on what the DERA Working Party want to know about its users. The research highlights the utility of customisable dashboards as a method of communicating key information related to these segments.

6. Investigate whether segments identified by web analytics confirm or challenges the perceptions of the market held by Library and Information Professionals

The DERA Working Party tended – where any segmentation took place at all – to concentrate on demographic factors – chiefly occupation. The segmentation model developed for this case study can be seen to mirror an

approach suggested by Potter based upon information seeking behaviour (2012, p.28). The models proposed embrace elements of behavioural, demographic and psychographic segmentation techniques and offers an alternative approach to the use of the more traditional demographics method that often characterises segmentation activities in information services (Bryson, 2006).

7. Identify the limitations of using web analytics to segment the market and suggest means of obtaining further data to inform the segmentation of the market for open access repositories.

The concerns over the extent to which the profession are willing to track the movements of its users that emerged in the interviews reflect the sector wide tension between notions of user privacy and the desire to use behaviour data to drive improvement (Salo, 2014) and point to a need to be explicit about any tracking activities that are being undertaken. The technical limitations discussed in the previous chapter show that effective deployment of web analytics can prove difficult and have significant effect upon the validity of the data captured. It is clear that in order for the DERA Working Party to develop an effective marketing strategy, additional qualitative data is required to investigate the reasons behind the data that emerges from web analytics. Future research could focus upon the most effective ways of gathering such qualitative data from users for an online repository. Lastly, and perhaps most importantly, web analytics can only be used to segment users of the resource. Potter (2012, p.27) refers to a hierarchy of segments – users and non-users – and web analytics can offer no information or insights related to those who are unaware of or do not use the resource.

Summary

Whilst the generalisability of this research is somewhat limited by the fact that a large amount of this research focuses upon the unique attitudes and perceptions of individuals working with a digital repository, it can be argued that this research still demonstrates that it is possible to select metrics and dimensions that can contribute towards developing insights into the market segments that exist for DERA users. Whilst the research design selected for this research meant that the data gathered could only be seen as one jigsaw piece that required further qualitative data to form a more complete picture of the potential market for DERA, the ability to use web analytics to produce customisable dashboards that can inform reports which focus upon the creation of actionable insights supports Arendt and Wagner's (2010, p. 50) contention that web analytics has the 'potential to empower staff to make better strategic decisions' based on a greater level of understanding of the user base.

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Appendix 1: Synonym and Subject Search for Initial Literature Search

Search Terms Synonyms	Related Subjects (primo Aber) (27/7/14)	Related Subjects (primo IOE) (27/7/14)	Related Subjects (BL) (27/7/14)	LISA (related searches) (27/7/14)	Lista (subjects) (27/7/14)
Web Analytics	web usage mining, internet users, google analytics, internet searching	internet, information services, web sites	commerce, mobile world, multimedia analysis, web, imaging	web sites, marketing, electronic commerce, internet, software	web analytics, websites, data mining, google analytics, search engines, web development
Marketing	marketing research, internet marketing, export marketing, consumer behaviour	marketing studies, Experiment/Theoretical Treatment, Experimental/Theoretical	marketing, American Marketing Association, Marketing science	marketing, market research, marketing and promotion, marketing and libraries, marketing and user services	marketing, publishers and publishing, books, libraries
Market Segmentation	marketing, market segmentation, marketing research, consumer behaviour, school to work transition	Experiment/Theoretical Treatment, Experimental/Theoretical, segmentation	economics, commerce, marketing, social sciences	marketing and market research	marketing, market segmentation, publishers and publishing, marketing strategy, information services, libraries
Open Access	open access publishing, libraries, open and closed shelves, open source software, digital libraries	internet	medicine, pharmaceutical chemistry, biotechnology, civil engineering, mechanical engineering	open access, electronic publishing, scholarly publishing	open access publishing, publishers and publishing, electronic publishing, research, access to information, scholarly publishing
Digital Repository	digital libraries, institutional repositories, libraries, library surveys, archives	digital libraries, metadata, institutional repositories, libraries	digital libraries, information storage and retrieval systems, electronic information resources, semantic web, education	digital libraries, internet, information technology	digital libraries, institutional repositories, library storage centers, metadata, libraries electronic information resources
Academic Library	academic libraries, libraries, Library science, Library administration	academic libraries, higher education, article, libraries, librarians	academic libraries, research libraries, education, information science, library science, information services, library administration, academic librarians, electronic information environment, academic library services	academic libraries, academic librarians, higher education	Non-fiction, book reviews, academic libraries, united states, libraries, websites.

Appendix 2: Wordle Representations of Synonyms for key search terms



1. Wordle representation of 'Web Analytics' Search Terms



2. Wordle representation of 'Marketing' Search Terms



3. Wordle representation of 'Market Segmentation' Search Terms

publishing



4. Wordle representation of 'Open Access' Search Terms



5. Wordle representation of 'Academic Library' Search Terms

Appendix 3: Invitation to Face-to-Face Research Interview

Invitation to take part in a research interview

My name is Daniel O'Connor and I am currently carrying out research for a dissertation which will contribute towards an MSc. in Information and Library Studies from the University of Wales, Aberystwyth.

In response to an initial enquiry via email, you have indicated that you would be interested in taking part in the interviews that I am conducting as part of my research. Please read the information contained within this invitation carefully and ensure that you are clear about the research project and the interview. If you require any further information please contact me.

The Research:

The title of this project is 'The use of web analytics in identifying key market segments for an open access digital repository. A case study of the Digital Education Resource Archive (DERA).'

The research will make specific reference to the Newsam Library and Archives, Institute of Education and aims to understand current awareness of the market for DERA.

It is hoped that the findings of the project will inform future market research activities at the Newsam Library and Archives, contributing towards an overall marketing strategy for DERA.

The Interview

Part of this research is concerned with market research strategies and activities for DERA. You will be asked about your work on the DERA resource, your involvement in any marketing strategies, your use of web analytics platforms and your perceptions of the market for DERA.

You can choose not to answer any of the questions asked during the interview and you retain the right to withdraw from the research at any time.

Details of the interview:

- **Duration:** The face to face semi-structured interview should take about 30 minutes of your time.
- **Recording:** A digital audio recorder will be used to record the interviews. Audio recordings of the interviews will be stored on one computer belonging to the researcher. The data will be secured through password protection and will only be used for this piece of research. It will be used in accordance with UK data protection legislation and the ethical research procedures of the Aberystwyth University.
- **Confidentiality:** This research is being conducted in accordance with the [Statement of Ethical Practice for the British Sociological Association](#). All the information about your participation in this study will be kept confidential.
- **Anonymity:** Although the research will make direct reference to the Newsam Library and to DERA, interviews will be anonymous and personal data removed at the transcription stage. Any direct quotes included in the report will be anonymised and will not be attributable to you.
- **Data security:** The information will be kept securely, and for only as long as necessary to: a) analyse the research data and b) report on the research and its findings.
- You can request a copy of the interview transcript.

- A full report and a summary of the research findings will be available upon completion and assessment of the dissertation.

If you agree to be interviewed please sign the accompanying consent form and return it to me (my address and contact details are on the sheet). I will then contact you to arrange a day and time convenient to you for us to meet.

Best Wishes,

Daniel O'Connor

Appendix 4: Face-to-Face Interview Consent Form

Consent form

Title of project: *'The use of web analytics in identifying key market segments for an open access digital repository. A case study of the Digital Education Resource Archive (DERA).'* undertaken as part of an MSc. in Information and Library Studies from the University of Wales, Aberystwyth.

Name of Researcher: Daniel O'Connor

I confirm that

- I have read and understood the contents of the invitation and I understand the purpose of this research
- I am aware that whilst direct reference will be made to the Newsam Library and Archives, Institute of Education, the information I provide will be confidential and anonymised.
- I confirm that my decision to consent is entirely voluntary and I understand that I am free to withdraw at any time without having to give a reason.

Name of Participant	Signature	Date
Name of Researcher	Signature	Date

Appendix 5: Face-to-Face Interview Documentation Sheet

Interview Documentation Sheet	
Interviewee Code:
Date and time of Interview:
Place of Interview:
Duration of Interview:
Time with organisation:
Working with DERA since:
Notes and observations:

Appendix 6: Face-to-Face Pilot Interview Questions

- Can you remember what marketing activity there was when DERA launched?
- Were these activities part of an overall strategy or was there a more ad-hoc approach - almost 'build it and they will come'?
- Some of the literature indicates that libraries might have an attitude problem towards marketing. Do you think that perceptions of what marketing represents has prevented a more strategic approach to marketing DERA?
- If I were to ask you to portray a typical user of DERA, what characteristics would you use to describe that user?
- The literature points towards the merit in segmenting the market in order to target marketing activities effectively. If you were to think of 3 key market segments for DERA, how would you describe them?
- Having defined some of these segments, can I ask you now to explain what data has informed your decisions?
- Google Analytics is used on DERA, what information do you or already get from the platform?
- Case studies on the use of web analytics in libraries point towards a tendency towards using web analytics for the purpose of site improvement and monitoring user behaviour. Have you used web analytics for this purpose?
- The research reveals little evidence in libraries of using web analytics in order to understand market segments. Has there been any reference to data from Google Analytics in order to carry out market research and identify market segmentation in DERA?

Appendix 7: Face-to-Face Interview Questions

- Can you remember what marketing activity there was when DERA launched in 2011?
 - [Follow-up if required] Can you remember if there were any email campaigns, posters or flyers produced?

- So, prior to DERA being launched was there a specific marketing strategy in place or was there a more ad-hoc approach - almost 'build it and they will come'?

- Generally speaking, how well do you think the library markets its services?
 - [Follow-up if required] Do you think the library could do more?
 - [Follow-up if required] What do you think prevents this?
 - [Follow-up if required] Do you feel that library professionals might be slightly wary of marketing?

- So, moving back to DERA once again, I wonder if you have an image of the 'typical' DERA user or users? If so what characteristics would you use to describe them?
 - [Follow-up if required] Is this description based on your own experience? How have you found out about who uses this resource?

- Turning to another area of the research. Google Analytics is already linked to DERA, do you know what information we already get from the platform?
 - [Follow up if required] How do you use this data

- If we could use Google Analytics to increase our knowledge of the market for DERA, what things do you think it would be important to know about our users?

- Do you feel that our users are made sufficiently aware that, although anonymised, their behaviour is being tracked?
 - If you were able to find out even more about our users, including estimations of their age, gender, and general interests would you be interested in doing so?

Appendix 8: Face-to-Face Transcription Guidelines (Flick, 2014, 390-391)

Layout:

Transcribed using:	OTranscribe
Font:	Arial 12
Margin:	Left: # Right: #
Page numbers:	On bottom left
Interviewer	I: interviewer
Interviewee	IP#: Interviewee #

Transcription

Spelling:	Conventional
Interpunctuation:	Conventional
Breaks:	Short break *; more than 1 second *no of seconds*
Incomprehensible:	((incomp))
Uncertain transcription:	(Abc)
Loud:	With Commentary
Emphasis:	With Commentary
Break off word:	Abc-
Break off sentence:	Abc-
Simultaneous talk:	#abc#
Paralinguistic sentence:	With Commentary (e.g. sighs...)

Appendix 9: Invitation to Email Research Interview

Invitation to take part in a research interview

My name is Daniel O'Connor and I am currently carrying out research for a dissertation which will contribute towards an MSc. in Information and Library Studies from the University of Wales, Aberystwyth.

In response to an initial enquiry via email, you have indicated that you would be interested in taking part in the interviews that I am conducting as part of my research. Please read the information contained within this invitation carefully and ensure that you are clear about the research project and the interview. If you require any further information please contact me.

The Research:

The title of this project is 'The use of web analytics in identifying key market segments for an open access digital repository. A case study of the Digital Education Resource Archive (DERA).'

The research aims to understand current awareness of the market for DERA (Digital Education Resource Archive), a resource developed by the Newsam Library and Archives which serves the UCL Institute of Education. DERA is a fully searchable digital archive for publications published electronically by the UK government and related bodies in the area of education. The resource can be accessed here: dera.ioe.ac.uk

One of the key research aims of this study is to investigate the use of commercially available web analytics software within the Library and Information Services sector. More specifically the research aims to examine the potential of web analytics to develop more effective marketing strategies through the identification of specific market segments.

The Interview

You will be asked about your work with web analytics software within the Library and Information Services sector.

You can choose not to answer any of the questions asked in the email interview and you retain the right to withdraw from the research at any time.

Details of the interview:

- **Duration:** The email interview should take about 30 minutes of your time.
- **Recording:** A transcription of the interview will be stored on one computer belonging to the researcher. The data will be secured through password protection and will only be used for this piece of research. It will be used in accordance with UK data protection legislation and the ethical research procedures of the Aberystwyth University.
- **Confidentiality:** This research is being conducted in accordance with the [Statement of Ethical Practice for the British Sociological Association](#).
- **Anonymity:** Please indicate if you require your responses to the interview questions to be anonymised. If this is the case any personal data will be removed at the transcription stage. If you do request anonymity, any direct quotes included in the report will be anonymised and will not be attributable to you.

- **Data security:** The information will be kept securely, and for only as long as necessary to: a) analyse the research data and b) report on the research and its findings.
- You can request a copy of the interview transcript.
- A full report and a summary of the research findings will be available upon completion and assessment of the dissertation.

If you agree to be interviewed please sign the accompanying consent form and return it along with your interview responses to the email address below.

Best Wishes,

Daniel O'Connor

Appendix 10: Email Research Interview Consent Form

Email Interview Consent form

Title of project: *'The use of web analytics in identifying key market segments for an open access digital repository. A case study of the Digital Education Resource Archive (DERA).'*
undertaken as part of an MSc. in Information and Library Studies from the University of Wales, Aberystwyth.

Name of Researcher: Daniel O'Connor

I confirm that

- I have read and understood the contents of the invitation and I understand the purpose of this research
- Please indicate whether you require your interview responses to be anonymised:
Yes
No
- I confirm that my decision to consent is entirely voluntary and I understand that I am free to withdraw at any time without having to give a reason.

Name of Participant	Signature	Date
Name of Researcher	Signature	Date

Appendix 11: Email Interview Questions

Part 1: The use of web analytics in Libraries

- (1) What do you feel are the main motivations for Libraries deciding to utilise web analytics software?
- (2) In your experience, have you encountered instances where Libraries have used web analytics to particularly good effect?
- (3) What barriers exist that might prevent Libraries from utilising web analytics software?
- (4) Although many web analytics platforms are free to use, what additional or unexpected costs might a Library need to consider?
- (5) What additional steps might be taken to ensure that Libraries utilise web analytics more effectively?

Part 2: The use of web analytics in the marketing activities of Libraries

- (1) In what ways do you feel that data from web analytics can contribute to the marketing activities of an academic Library?
- (2) To what extent do you feel that web analytics inform understanding of the market for a resource, what additional activities do you think are needed to ensure a fuller picture?
- (3) If a Library wishes to use the 'Demographics and Interests Reports' in Google analytics it also involves enabling Google Analytics Display Advertising Features. How would you respond to concerns that Library Professionals might have over the deployment of some of the features available in web analytics?

Appendix 12: Top Ten Web Analytics Platforms

Platform	Absolute Usage Percentage	Market Share
None	38.7%	
Google Analytics	50%	81.6%
Yandex.Metrica	4%	6.5%
Wordpress Stats	3.5%	5.7%
Live Internet	3.3%	5.5%
StatCounter	1.9%	3%
New Relic	1.4%	2.3%
CNZZ	1.3%	2.1%
Piwik	1.3%	2.1%
Histats	1.2%	1.9%
Baidu Analytics	1.1%	1.8%

Percentages of websites using various traffic analysis tools
Note: a website may use more than one traffic analysis tool

Source: http://w3techs.com/technologies/overview/traffic_analysis/all

Usage of Traffic Analysis Tools for Websites (Updated Daily): Report Taken
22/12/14

Appendix 13: Model of Digital Demographics Dashboard and Report

Digital Demographics Report for DERA

Comparison of key digital demographics between Oct 1st 2013-Jan 1st 2014 and October 1 2014-Jan 2015

Sessions

Oct 1, 2014 - Jan 1, 2015

50,623

% of Total: 100.00% (50,623)



Oct 1, 2013 - Jan 1, 2014

40,528

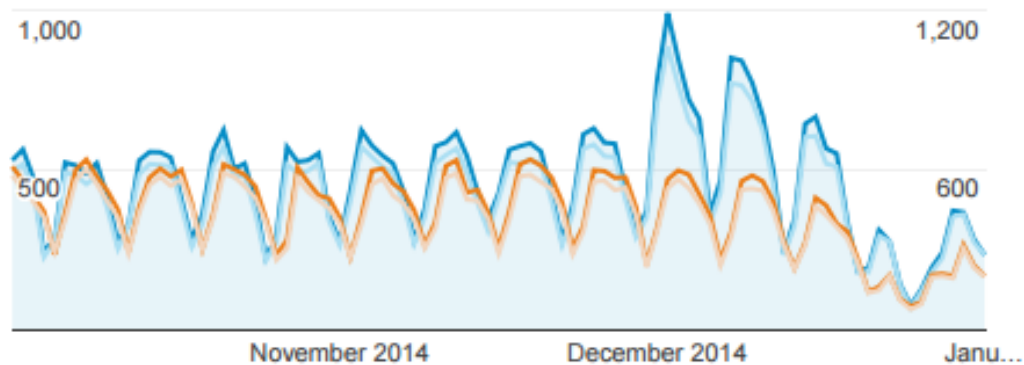
% of Total: 100.00% (40,528)



New Users and Users

Oct 1, 2014 - Jan 1, 2015: ● New Users ● Users

Oct 1, 2013 - Jan 1, 2014: ● New Users ● Users



Sessions and Bounce Rate by Source / Medium

Source / Medium	Sessions	Bounce Rate
google / organic		
Oct 1, 2014 - Jan 1, 2015	35,767	72.92%
Oct 1, 2013 - Jan 1, 2014	26,846	68.95%
% Change	33.23%	5.75%
(direct) / (none)		
Oct 1, 2014 - Jan 1, 2015	6,793	65.92%
Oct 1, 2013 - Jan 1, 2014	6,204	65.41%
% Change	9.49%	0.78%
bing / organic		
Oct 1, 2014 - Jan 1, 2015	2,985	76.45%
Oct 1, 2013 - Jan 1, 2014	2,414	72.99%
% Change	23.65%	4.74%
yahoo / organic		
Oct 1, 2014 - Jan 1, 2015	800	76.88%
Oct 1, 2013 - Jan 1, 2014	645	77.67%
% Change	24.03%	-1.03%

ioe.ac.uk / referral		
Oct 1, 2014 - Jan 1, 2015	369	46.88%
Oct 1, 2013 - Jan 1, 2014	422	36.73%
% Change	-12.56%	27.64%
webliography.next.college.com / referral		
Oct 1, 2014 - Jan 1, 2015	278	50.00%
Oct 1, 2013 - Jan 1, 2014	470	57.87%
% Change	-40.85%	-13.60%
phonicsplay.co.uk / referral		
Oct 1, 2014 - Jan 1, 2015	274	59.85%
Oct 1, 2013 - Jan 1, 2014	0	0.00%
% Change	100.00%	100.00%
ioe.sirsidynix.net.uk / referral		
Oct 1, 2014 - Jan 1, 2015	149	44.97%
Oct 1, 2013 - Jan 1, 2014	228	48.25%
% Change	-34.65%	-6.80%
libguides.ioe.ac.uk / referral		
Oct 1, 2014 - Jan 1, 2015	149	28.86%
Oct 1, 2013 - Jan 1, 2014	75	37.33%
% Change	98.67%	-22.70%
ble.ioe.ac.uk / referral		
Oct 1, 2014 - Jan 1, 2015	126	65.87%
Oct 1, 2013 - Jan 1, 2014	53	60.38%
% Change	137.74%	9.10%

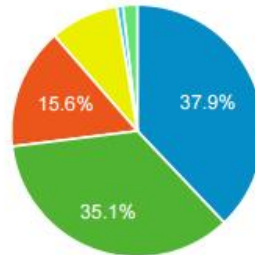
Sessions and Bounce Rate by Device Category

Device Category	Sessions	Bounce Rate
desktop		
Oct 1, 2014 - Jan 1, 2015	43,865	70.11%
Oct 1, 2013 - Jan 1, 2014	35,877	66.52%
% Change	22.26%	5.39%
tablet		
Oct 1, 2014 - Jan 1, 2015	3,520	76.25%
Oct 1, 2013 - Jan 1, 2014	2,848	74.51%
% Change	23.60%	2.34%
mobile		
Oct 1, 2014 - Jan 1, 2015	3,238	80.64%
Oct 1, 2013 - Jan 1, 2014	1,803	81.64%
% Change	79.59%	-1.23%

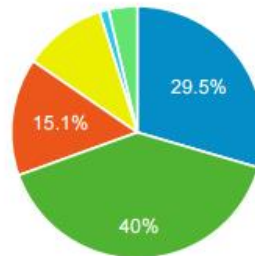
Sessions by Browser

■ Chrome ■ Internet Explorer ■ Safari ■ Firefox
■ Android Browser ■ Other

Oct 1, 2014 - Jan 1, 2015



Oct 1, 2013 - Jan 1, 2014



Key Insights and Suggested Actions

<p>Majority of DERA users arrive through organic search, with Google accounting for 70.6% of visits</p>	<p>Traffic referred directly to DERA from other websites has a lower bounce rate than from Organic Search</p>	<p>Access to DERA via mobile phones increased 75% but Bounce Rate stands at 80.64%</p>	<p>Chrome has overtaken Internet Explorer as the Browser most used by visitors</p>
<p>Investigate any differences in page rankings for DERA across different search engines.</p> <p>Investigate effectiveness of promotion of DERA resource on IOE website as referrals were 12.6% lower in comparison to the same quarter last year.</p> <p>Use qualitative methods to understand motivations for visiting DERA: Embed pop-up exit questionnaire asking three key questions: (1) What was the purpose of your visit? (2) Did you find what you needed? (3) How easy was it to find what you needed?</p>	<p>DERA Working Party to contact referrers in order to discuss opportunities to promote DERA as a resource.</p> <p>DERA Working Party to identify other websites that might point users to DERA. Develop a structured plan of engagement in order to maximise effectiveness.</p>	<p>DERA Working Party to plan and initiate website functionality on major operating systems (IOS, Android and Windows Phone).</p> <p>DERA Working Party to investigate feasibility of development of a standalone DERA APP designed for mobile phone use.</p> <p>Set a target Bounce Rate equivalent to that of those who arrive at resource from a desktop.</p>	<p>DERA Working Party to investigate performance of DERA on all web browsers identified in report.</p> <p>Utilise 'crash' reports available in Google Analytics in order to identify technical issues.</p>

Appendix 14: Model of User Experience and Engagement Digital Dashboard and Report

Report for DERA

Comparison of key User Experience and Engagement metrics between Oct 1st 2013-Jan 1st 2014 and October 1 2014-Jan 2015

Overall Site Visits

Oct 1, 2014 - Jan 1, 2015

50,623

% of Total: 100.00% (50,623)



Oct 1, 2013 - Jan 1, 2014

40,528

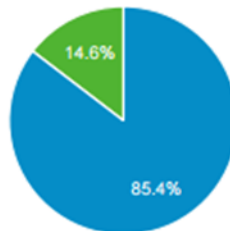
% of Total: 100.00% (40,528)



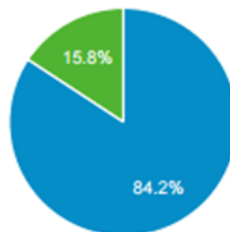
Sessions by User Type

■ New Visitor ■ Returning Visitor

Oct 1, 2014 - Jan 1, 2015



Oct 1, 2013 - Jan 1, 2014



Pageviews and Pages / Session by User Type

User Type	Pageviews	Pages / Session
New Visitor		
Oct 1, 2014 - Jan 1, 2015	75,277	1.74
Oct 1, 2013 - Jan 1, 2014	64,172	1.88
% Change	17.31%	-7.38%
Returning Visitor		
Oct 1, 2014 - Jan 1, 2015	18,694	2.53
Oct 1, 2013 - Jan 1, 2014	16,620	2.60
% Change	12.48%	-2.72%

Avg. Session Duration by User Type

User Type	Avg. Session Duration
Returning Visitor	
Oct 1, 2014 - Jan 1, 2015	00:01:50
Oct 1, 2013 - Jan 1, 2014	00:02:07
% Change	-13.58%
New Visitor	
Oct 1, 2014 - Jan 1, 2015	00:00:59
Oct 1, 2013 - Jan 1, 2014	00:01:10
% Change	-15.49%

Traffic from Social Networks

Social Network	Sessions	Bounce Rate
Facebook		
Oct 1, 2014 - Jan 1, 2015	88	72.73%
Oct 1, 2013 - Jan 1, 2014	47	74.47%
% Change	87.23%	-2.34%
Twitter		
Oct 1, 2014 - Jan 1, 2015	47	68.09%
Oct 1, 2013 - Jan 1, 2014	10	80.00%
% Change	370.00%	-14.89%
Blogger		
Oct 1, 2014 - Jan 1, 2015	3	66.67%
Oct 1, 2013 - Jan 1, 2014	4	25.00%
% Change	-25.00%	166.67%
Netvibes		
Oct 1, 2014 - Jan 1, 2015	3	66.67%
Oct 1, 2013 - Jan 1, 2014	0	0.00%
% Change	100.00%	100.00%
SlideShare		
Oct 1, 2014 - Jan 1, 2015	3	100.00%
Oct 1, 2013 - Jan 1, 2014	1	0.00%
% Change	200.00%	100.00%

WordPress

Oct 1, 2014 - Jan 1, 2015	3	33.33%
Oct 1, 2013 - Jan 1, 2014	3	100.00%
% Change	0.00%	-66.67%

Bloglines

Oct 1, 2014 - Jan 1, 2015	2	0.00%
Oct 1, 2013 - Jan 1, 2014	0	0.00%
% Change	100.00%	0.00%

LinkedIn

Oct 1, 2014 - Jan 1, 2015	1	100.00%
Oct 1, 2013 - Jan 1, 2014	1	0.00%
% Change	0.00%	100.00%

Key Insights and Suggested Actions

<p>Returning users account for 14.6% of sessions</p>	<p>Returning users visit more pages per session and spend longer on resource than new users although both metrics have reduced in Q4 year-on-year</p>	<p>DERA sessions originating from Social Networks represents 0.03% of total</p>
<p>DERA Working Party to investigate an optional 'User Registration' feature, allowing users to be emailed when documents related to their areas of interest are added to the repository.</p> <p>DERA Working Party to investigate design of resource. Does it appeal to new visitors?</p> <p>DERA Working Party to examine 'competing' resources such as GOV.uk and the UK Government Web Archive and compare offer. Do they provide services that DERA does not currently offer?</p>	<p>Return users spend almost twice as long on the site during a session: Use Clickstream analytics software to investigate navigability of website.</p> <p>DERA Working Party to investigate feasibility of adding links to related documents to the target document page.</p> <p>Identify whether any changes to the DERA resource web pages made over the year have affected user experience.</p>	<p>DERA Working Party to make Social Network Campaign a priority.</p> <p>Engage with other similar organisations who operate a similar resource and investigate best practice.</p> <p>Identify Social Networks which encourage highest level of engagement (via Bounce Rate, Pages Per Session, Time on Page) and concentrate marketing efforts on these networks.</p> <p>Build relationships with other organisations and encourage them to promote DERA resource amongst their networks.</p>