Turner

Demonstrating library value: the use made of information provided by an NHS library service, and how that use relates to organisational goals.

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Contents

Appendices

List of tables

Declaration and Statement page

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.

Signed .... (candidate)

Date ....
[*this refers to the extent to which the text has been corrected by others]

STATEMENT 2

I hereby give consent for my work, if accepted, to be available for photocopying and for inter-library loan, and for the title and summary to be made available to outside organisations.

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Summary

Government policies, including the establishment of Foundation Trusts, require NHS organisations to review service delivery and its value. This research took place in an acute NHS hospital as it worked for Foundation Trust status, and the library service was asked what value it had for the organisation.

The existing measures included user satisfaction surveys, activity counts, and accreditation through the national scheme for healthcare libraries, but this was insufficient in determining the real value in terms of the difference made to the organisation from services provided. The aim of the research was to determine how the value of the library could be established in terms recognisable by managers.

The literature review identified that organisational goals would probably represent value to managers. The objective of the dissertation was therefore to find evidence that the library service contributed to organisational goals.

A mixed methods approach was used, consisting of interviews of library members (n=3), Trust board members (n=3), questionnaires of library members (n=60 sent), using validated instruments as far as possible (including a taxonomy and the NHS toolkit for library impact studies).

 Information provided by the library contributed to a higher quality of patient care, provided new knowledge, and that knowledge would be shared, memories refreshed, or prior knowledge substantiated. Decisions were better informed, and time was saved.

All of these uses directly related to the organisational goals, in particular the support of continuing professional development, and direct patient care, both key top level objectives of the organisation. The study provided statistically robust evidence that could be used by libraries with a similar population, as well as providing additional validation of the NHS toolkit tools.

The concepts of *information-as-knowledge*, *value-in-use* and *self-perceived value* are appropriate for library impact studies as they recognise the complexities of information, values, and information behaviour. The results suggest that NHS managers accept *self-perceived* value indicators.

1. Chapter 1 Introduction to the research study

1.1 Introduction to chapter one

This chapter sets out the environment in which the study took place. It identifies the background and purpose of the research, the theoretical context and the specific research questions.

1.2 Background setting to the research study

The research took place in East Sussex Hospitals NHS Trust (ESHT), an acute Trust employing 5170 staff and delivering services to a population of around 500,000. The acute services are mainly based on two hospital sites: the Conquest hospital in Hastings, and the Eastbourne district general hospital. The sites are 25 miles apart but with poor transport links and transfer times varying between 30 minutes to over an hour.

There is a physical library on both hospital sites, with 2 qualified librarians on each site (3.62 whole time equivalents (WTE)) and 5 library assistants (4 WTE). One site is managed by the NHS Trust, the other managed jointly with a University. The University-managed site has a mix of NHS and higher education (HE) employees and a mix of NHS and HE software, procedures and processes. The use of different library management systems and data-protection issues across organisations has influenced the study.

1.3 The general problem to be explored

The government strategy for the NHS includes the establishment of Foundation Trusts, semi-independent organisations working in a commercial landscape (Department of Health, 2005). ESHT is preparing an application for Foundation Trust status, against a background of financial pressure, challenging targets and service reconfiguration. Politically the drive is for patient choice, delivery of care close to the patient, independent treatment centres, centralised specialist services, funding following patient choice and payment by results. The political

direction is set out in the Darzi report (Darzi, 2008) and a range of policy documents arising from the NHS White Paper: The new NHS, modern and dependable (Department of Health, 1997)

In response to these challenges, managers are reviewing the role of the acute NHS hospital Trust and identifying (with the other local NHS or private organisations) how services will be delivered, and the financial implications for each organisation. Foundation Trust status offers more financial independence, with corresponding personal and organisational accountability for the Board members. This will influence decisions about what remains part of the business and stays within the organisation.

The library service was asked what performance measures were currently in place. These were the well established measures used by most libraries: activity and output counts to indicate the service is actually used (and by implication relevant) and user satisfaction surveys that demonstrate effectiveness and quality. Some of these measures could be judged in a national perspective, and an accredited quality check was in place with Helicon. Helicon is now replaced by the National Service Framework for library standards (National Library for Health, 2008)

Output measures like "X number of articles and x number of books were provided to staff in 2007/8" prompted questions about what real value that demonstrated, what difference would have been made to achieving organisational objectives if those items had not been supplied. This then was the problem, and a different way of demonstrating the value of the library service was required.

In some ways this echoes developments in America in 1986, when hospital libraries ceased to be legal requirements and were forced to prove their worth, prompting the surge of research into the value and impact of hospital libraries (King, 1987).

1.4 Definitions and identifying the theoretical background

1.4.1 Information

Information theories began to emerge in the 1940s, but there is still no agreed definition (Avgerou & Cornford, 1998 p.112 and Checkland & Scholes, 1990 p. 304). In the relevant research literature, information is usually defined (explicitly or not) in two ways. One defines information in terms of a tangible object (e.g. a book, document, image or text). Michael Buckland uses the phrase "information-as-thing" (Buckland, 1991). The second way of defining or viewing information is as an interaction between an object and the receiving mind; the book or image carries a message to the user. Buckland identifies this as "information as knowledge" and adds a third definition, that of "information-as-process" to describe the act of informing. The use of this third definition was not evident in the literature retrieved for the study.

The definition adopted depends on the purpose of the research study, and should affect the choice of methodology. This point is made by Dervin in her work on sense making (Dervin, Foreman-Wernet & Lauterbach, 2003). She sets out the importance of a sound theoretical basis when devising a research methodology. Dervin recognises the influence of situation and individuality in research, and places individuals at the centre of the research rather than processes or services. Using her approach, information use research would explore the whole information incident, so both researcher and information user could "make sense" of it. The approach would use the definition of "information-as-knowledge" in that the message as perceived, defined and valued by the receiver is the "information".

For a researcher to "make sense" of individual information use, Dervin suggests the concept of *gaps* and *bridges.* An individual, at a particular time and in a particular situation, has a gap in their knowledge which prevents moving on in some way. To bridge that gap the individual constructs a strategy to gain information. A strategy may be constructed for each gap, or (if a similar gap has

been bridged before) be reused. Studying individual bridging strategies can identify a pattern, or may identify strategies common to many individuals, in seemingly random information behaviour. This suggests that to explore information use, the whole context is useful, identifying what was needed, the resources used, how searches were done and then how the knowledge obtained was used (the self-perceived impact).

Dervin's approach recognises that an individual's information behaviour depends on time and situation. This chimes with the use of critical incident techniques in information behaviour research (Urquhart et al., 2003) to focus on a particular information incident.

"Information-as-thing" suggests that the information has an established form which remains constant regardless of the individual. This concept of information would be most appropriate for studies taking a realist, objectivist stance, for example into resource use (how often was this database accessed, or this book issued).

This study makes use of both definitions. Participants were selected from a population defined by virtue of the information products they obtained through the library, but studying their use of the information referred to the message contained, and what they made of it.

1.4.2 Value
The ultimate objective of the research was to demonstrate the "value" of the library service to the organisation.

Theories about value have developed from economic and social traditions. The social tradition relates value to goodness and desirability. Saracevic and Kantor (1997) explore this tradition, identifying that some things are intrinsically of good value (health for example) others (like exercising to achieve health), are extrinsic or instrumental. Many things are contributory to value (used with other things for

good). Library and information services may have value in all these ways. Information may be valuable to an individual, and the physical presence of a library in a community, with all its services and resources, may be valuable to a community. Brophy (2006, p. 78) uses the term *social capital*, first used in the 1970s, to discuss the impact of libraries within a society.

Value in the economic tradition can be more clearly defined. Value can be set against the objective measure of money. The most obvious economic measure is what Saracevic and Kantor (1997) call *value-in-exchange,* the simplest form being money for goods (the product costs £100 to produce and is priced at £150 so the value to the company is £50). Information services can be exchanged for money, but in many library services prices and costs are unclear.

The concept of *value-in-use* is more applicable to many information services. Rather than directly pricing services, economic value is shown through the impact of *using* information provided by the library. As ESHT library services did not operate in a market environment, but needed to demonstrate value in the economic terms demanded by the political environment, the idea of *value-in-use* was chosen for the study.

Relevant research in healthcare that fits this *value-in-use* concept, looks at time saved, length of stay reduced, decisions changed and tests avoided (Burton,1995; Weightman & Williams, 2005; Cuddy, 2005; Banks, 2007 and Klein, Vantoll Ross, Adams & Gilbert, 1994). In some research a money value can be set against these measures, and such concepts as "return on investment" and "cost benefits" can be applied. There have been developments in the American public library sector (Imholz & Arns, 2007) and the American academic library sector (Luther, 2008) in establishing value in these economic terms. Luther's case study (Luther, 2008) identified return on investment by focusing on the grant income generated by a faculty using library services and resources.

Saracevic and Kantor cite work by Ahituv and Neuman in 1986, and state "the value of information rests with improvements in decision making" (Saracevic & Kantor, 1997 p. 533). By measuring changes in decision making before and after information is supplied, value can be shown and expressed in money terms. A direct cause and effect can also be demonstrated. This is a very attractive idea for library services trying to show value. It is the theory behind influential research into the impact of information (in the form of literature searches) on length of stay and patient care costs (Banks, 2007;Klein et al., 1994)

This type of approach assumes a direct relationship between information and improved decisions, and views information as a stand-alone item. It is very complex to unpick a single piece of information from a decision making process. This point was identified as a weakness in Klein's study "the impact of any one intervention (on patient outcome) is difficult to distinguish" (Klein et al., 1994 p. 494). It was also a weakness in Luther's case study (Luther, 2008), the extent to which the library input could be isolated from the other aspects of successful grant applications was unclear.

Another approach relies on an individual's own perception of the value of information to them, the *perceived-value* approach (Saracevic & Kantor, 1997). The information user could perceive that time had been saved, or a length of stay reduced without a specific money saving attached. This approach takes into account the complexity of information use and was therefore adopted in this study.

1.4.2.1 The value context
As Myrdal identifies "A value premise should not be chosen arbitrarily: It must be relevant and significant in relation to the society in which we live. It can therefore, only be ascertained by examination of what people actually desire" (Myrdal,1958, p. 2) . In the academic sector, and linked to funding, the point was echoed by Luther "In making decisions about competing priorities, university administrators

evaluate their options in terms of how to allocate resources in the optimum way that will enable the institution to achieve its goals" (Luther, 2008 p. 3).

Putting this approach into practice is advocated in the healthcare library literature, "close alignment with organisational aims and objectives, using a taxonomy for library contributions, may facilitate effective communication of the positive impact of library and information services" (Lacey Bryant, 2006 p.124).

Individual, organisational and social perceptions of value are obviously connected as individuals make up a society, but they can also be at odds. Individuals align themselves with more than one group. This was first evidenced by the Hawthorne studies, carried out in the 1920's and 1930's by Professor Elton Mayo (Cole, 1996). The studies identified the importance to individuals of group membership, and also that within an organisation's formal group structure (departments or divisions) other informal groups form with shared interests, values and goals.

Proving value to organisational leaders must therefore be related to what they value, which is set out in the organisational objectives. Evidence may also be needed from individual leaders to check their goals and objectives do not differ from those expressed in corporate documents.

1.4.3 Organisational goals or objectives

The study of organisations can be traced back to 19th century writers like Saint-Simon (Reed, 1992). Organisation was considered a new and effective way of controlling society, an outcome from the social changes of industrialisation. Organisations offered structures that "subsumed sectional interests within institutionalized collective goals" (Reed, 1992 p. 31) Organisational and group theories still identify shared objectives and values as a defining factor (Cole,1996). Organisational research indicates that clear messages about genuinely held objectives and values distinguish successful organisations (Deal, 1982).

What is valued by organisational leaders is articulated in organisational objectives, goals and mission statements. The process is obviously complex, the influence of past tradition, corporate culture, existing guidance and policy frameworks all shape individual and corporate goals within the context of an organisation. (Clegg, Hardy & Nord, 1996). Explicit objectives may be driven by external forces, not just by the ideas or values of managers. In their work on corporate strategy, Johnson and Scholes (2005, p. 112) identified four main influencing factors "corporate governance, stakeholder expectations, business ethics and culture."

In the literature the terms *goals*, *objectives* and *aims* seem to be used interchangeably, to denote something to be worked towards, achieved or gained. Exploring corporate language is not part of this research, and the terms have also been used interchangeably in the study.

1.4.4 Conclusions from the theoretical background

Exploring the relevant theories translated the general problem (how to meaningfully demonstrate to managers the value of the library service to the organisation) into a practical research study. The economic, rather than the social, concept of value was considered most relevant for the purpose of the study. Value could be demonstrated by *value-in-use* of information supplied by the library service. This could be measured by the *perceived value approach*, and also related to organisational objectives to provide a value context. The definition of information adopted was *information-as-knowledge*.

1.5 Aim of the research and the research questions

1.5.1 Hypothesis

The hypothesis, based on previous research (Abels, Coghill & Zach, 2004; Cuddy, 2003; Lacey Bryant & Gray, 2006) was that information obtained through the library service was used in ways that directly related to organisational goals.

1.5.2 Theme and objective of the research and research title

The general theme for the research was the value of the library service to the organisation.

The objective was to find evidence that the library service contributed to organisational goals. Previous research into information behaviour indicated that evidence of information use was available (King, 1987; Urquhart & Hepworth, 1995; Klein et al.) and that it would link to organisational goals (Abels et al., 2004, Cuddy, 2003; Lacey Bryant & Gray, 2006). The evidence then needed to be presented in a way that very senior managers would find convincing.

The research title was: *Demonstrating library value: the use made of information provided by an NHS library service, and how that use relates to organisational goals.*

1.5.3 Research questions
The research questions were:
1. What use is made of the information provided by the library service?
2. How may organisational goals be translated to the mission of the library service (to provide or enable access to information)?
3. Does information use relate to organisational goals?

Possible additional outcomes were:
- Additional validation of the questionnaire
- Validation of the interview schedule

1.6 Guide to the chapters

Chapter one sets out the background and purpose of the research, including the hypothesis and specific research questions. Chapter two explains the search strategy used to find the relevant literature. Chapter two also explores the themes and ideas in the literature to show how this study developed as it did. Chapter three deals with the methodology, including the theoretical basis for the study

and the detailed research process (to enable replication). Chapter four presents the results, which are discussed in Chapter five. Chapter six concludes the study, commenting on the research process and making recommendations based on the results and outcomes of the study.

The American Psychological Association (APA) style of referencing is used.

2. Chapter 2. Literature review

2.1 Introduction to chapter two

This chapter outlines the search strategy used to identify the literature relevant to the study. It also identifies the main themes that emerged from the literature and how they influenced the research.

2.2 Search strategy

The search strategy is detailed in Appendix 2A. The initial 14 articles were summarised to start identifying ideas and themes (Appendix 2B). Further relevant references were subsequently identified and summarised (Appendix 2C), to explore ideas and develop the research approach and study design.

2.3 Themes and ideas in the literature

2.3.1 Approaches to evaluating library services

Two main approaches emerge from the literature (Brophy, 2005; Hardy, Yeoh & Crawford, 1985; Urquhart & Hepworth 1995; Abels et al., 2004) evaluating the library service itself (is it fit for purpose, are clients happy with it) and evaluating the use made of information provided.

Counting the number of articles supplied, literature searches performed, books loaned etc. is an established way of demonstrating that the library is used (and by implication valuable) and these activities can be benchmarked to other similar libraries. The measuring of outputs (or inputs), and user satisfaction surveys are

most relevant for guiding service developments and assessing the quality of existing services (Poll & Payne, 2006).

To demonstrate impact (what difference does the library make) researchers evaluate the use that is made of information (King, 1987; Burton 1995; Cuddy, 2005; Marshall, 1992; Urquhart & Hepworth, 1995).

Definitions of information are often implicit in the literature. Information use studies mainly used the concept of *Information-as-knowledge* when exploring impact on behaviour. When asking about information sources the concept of *information-as-thing* was used. There was potential for confusion between the two, for example the term "guidelines" was used to identify an information type *(information as thing)* but also to identify an information use (guidance of behaviour) which would take the *information-as-message* definition.

2.3.2 Information use changes behaviour

Several key research studies based their methodology (surveys) on the idea that information had the impact of changing behaviour (King, 1987; Klein et al., 1994; Burton,1995). If the change improved decision making then this information use demonstrated value. The studies sought to identify specific changes (e.g. changed diagnosis or prompting a request for a specific therapy), and how frequently that happened. Information use was assessed through recording the subjective perceptions of the user. The assumption was usually made that changes to proposed actions or decisions were good.

This approach is echoed in the Impact Implementation Initiative for higher education libraries (Payne 2006). Recommendations on their webpage (SCONAL, n.d.) include looking for "change in people", and identify potential changes as: affective (attitudes, levels of confidence, satisfaction with the service) behavioural (people do things differently) and knowledge-based (e.g. knowing about key sources of information).

Brophy (2005, p. 47) likens information use to learning, in that the impact can be immediate or longer term. He also identifies a *levels of impact model*, which includes a six point scale, moving from *awareness* to *changed action*.

2.3.3 Information use changes outcomes

Two studies assessed the use of information by looking at objective outcomes which could be measured and given a monetary value e.g. time saved or reduced length of stay. The researchers viewed information as an intervention that impacted on patient care (Banks et al., 2007; Klein et al., 1994). Both used case studies, an appropriate methodology for interventions. The intervention was not really on the patient but on the information users. To prove that a unique piece of information (separate from context and other interventions or from experience, knowledge, education and personality) improved patient care was difficult and this was recognised by the researchers. As Klein stated "Overall health care outcomes result from the interplay of myriad, complex components. The impact of any one intervention is difficult to distinguish" (Klein et al., 1994, p. 494)

2.3.4 Information is used in more than one way

The literature suggests that a single piece of information can be needed and used for more than one purpose, and the actual use may differ over time (Urquhart & Davies 1997; Urquhart & Weightman, 2008; Brophy, 2005). This idea was reflected in the current study by exploring both immediate impact and possible future use.

2.3.5 Information can be used but be of no value

Providing evidence of information use does not demonstrate value. Information may be used, but not be perceived as valuable by the user or the broader organisation. Studies place information use in a value structure. This is often implicit, for example the use of information to inform patient care is presumed to indicate value when the research is in a hospital setting.

The Rochester study of 208 physicians used a seven point scale to rate the importance of the decision change on patient care, prompted by information

provided by the library (Marshall, 1992). The Fuld Campus study of 56 patrons (Cuddy, 2005) used a taxonomy of organisational terms (Abel et al., 2004) to present the research results in a value framework relevant to the organisation. The impact of using the clients' value framework is highlighted in a paper by Van Moorsel (2005) in the context of a business library.

2.3.6 Who provides the information

There are alternative information providers to local NHS library services. The internet, the National Library for Health (now NHS Evidence) e-publishing, and many other internet-based services add competition, directly marketing information to the end-user. If the value of the local library is to be demonstrated by information-use, the link must be made between information use and the NHS library as the source of that information.

Recent research has explored the effectiveness of providing electronic access to health information (McGowan & Richwine 2000). Pluye, Grad, Stephenson and Dunikowski (2005) have proposed a new impact assessment method to evaluate electronic knowledge sources, which, like the Rochester study (Marshall, 1992) seeks to measure the level of impact (including a negative impact).

Research by Weightman and Williamson (2005) and the NLH toolkit (Urquhart et al., 2008) specifically sought to identify libraries and library staff as sources of information. The methodology of some studies reinforced the link by surveying library users, or contacting users after specific information-seeking.

2.4 Current directions and conclusions from the literature

The message from the literature is that libraries in all sectors need to demonstrate their value. Benchmarking, fitness for purpose and service quality are still very important but demonstrating value more so, as this is tied to funding.

Current research into value and impact in healthcare library services indicates that exploring *information-in-use* is an appropriate approach. There are two

directions: the first is to treat information as an intervention and study the impact on measurable outcomes expressed in money terms (Banks et al., 2007, Klein et al., 1994). The second direction is to survey information users about their perceptions of the impact and use of information.

A complex picture of information and information behaviour emerges from the literature. Impact studies of the *value-in-use* of information depend on our understanding of information behaviour, and that is still developing. As Case observed (Case, 2007, p. 327) information behaviour is dynamic and complex. The literature indicates that impact studies should be aware of the context and situation as these seem central, and provide some evidence of the level of importance of the impact or use of information.

An emerging theme, mainly from work in America, is to question the emphasis on economic concepts of value and include the broader social value of libraries, "some library researchers, however, are sensing that these traditional econometric measurements are providing limited insight into the broader social capital that libraries create and the social benefits they bestow" (Imholz & Arns, 2007, p.16). This may inform the development of future impact studies, perhaps when the economic value of libraries is more established.

2.5 Why do more research in this field?

The local library service needed robust evidence (from research of its own users) to demonstrate its value to organisational leaders, in a way that they would find meaningful.

The importance of establishing the value of a library service is recognised, but relatively few robust *value-in-use* impact studies have been done. As Markless and Streatfield (2006, p. 41) state "we can currently see:

- lots of descriptive and anecdotal evidence and descriptions of best practice

- little detail of data-gathering methods; absence of systematic and rigorous reporting (this is a real issue for the field) and as a result
- often no way of identifying the quality of data collection through published reports "

More research is necessary to build an accurate picture of information behaviour and impact in healthcare libraries by replicating and adding to existing evidence.

With appropriate sampling, results from this study could be generalised to other similar services, and also be used to inform local service development.

Few studies (Cuddy, 2005; Abels et al., 2004) have related information use to organisational values (expressed as organisational goals) and further research would add to the body of knowledge.

3. Chapter 3. Methodology

3.1 Introduction to chapter three

This chapter identifies the general approach and methodology of the research study, and explains the practical process. The most appropriate methodology, study design and research strategy were identified from previous research and research theory. Detailing the research process enables replication of the study to validate results thus adding to the external validity of the research on the impact of health library services.

3.2 General approach

The general theme of the research was the value of the library service to the organisation. The concepts *value-in-use*, *information-as- knowledge* and *perceived- value* had been adopted. An assumption had been made: that, in reality, relating information use to organisational goals would demonstrate the value of the library service more effectively than user satisfaction surveys or activity levels. The adoption of these concepts, and the assumption made about "reality" showed the ontological and the epistemological orientation of the study.

This orientation indicated the nature of the enquiry and most appropriate methodology.

Ontology is about the "nature of social entities" (Bryman, 2004) and the main stances are defined as objectivism and constructivism. This study took the constructivist stance. This stance acknowledges that multiple realities can be constructed, defined and made meaningful to others, while at the same time individuals may not share that construct, or its meaning may change over time. This study attempted to construct a 'reality' of the *value of information* which could be understood by a range of individuals from different disciplines (researcher, managers, librarians, healthcare workers). It was recognised that the researcher's role as part of the construct would introduce a bias. The perspective introduced by the researcher drew on previous research which, it was hoped, would limit the bias.

Epistemology is the accepted knowledge in a particular discipline (Bryman, 2004). The perspectives or stances are generally defined as positivism, realism and interpretivism. This study took the realist approach, it made assumptions that a reality (about information use, and ideas of value) could be discovered by research, but recognised that the reality existed in a setting and a moment.

The research theme was chosen because of the very real consequences if local NHS library services did not demonstrate their value. This reflected an understanding by the researcher (from previous research and personal experience) that the local library did have a particular and valuable role, and that existing service measures were not convincing to organisational managers. User satisfaction rates and activity levels were important markers but demonstrated no definite impact on day-to-day organisational business concerns.
Previous research on information use in healthcare had identified an impact on patient care, and on personal and professional development (Burton, 1995; Cuddy, 2005; Marshall, 1992; Urquhurt & Hepworth, 1995), both of which were

key organisational goals. Linking information use to organisational goals seemed a productive area to explore, as health service policy has shifted.

The concept of value-in-use was chosen to do this; the idea that the uses made of information added value to the organisation in economic not social terms. This might be in time saved, or risk reduced, or decision changed.

Also adopted was the concept of *information- as- message* as the definition of information. This recognition of multiple factors, external and individual (experience, education etc.) on information use precluded a positivist, objectivist methodology that relied on the concept of information as a stand-alone item. The objectivist, for example, would seek to prove that - "this item of information led to this decision which reduced length of stay by x days which equals £x."

A realist, constructivist stance was required, where *value-in-use* was perceived by the user, and the user themselves influenced the information use - "I perceive this information had an impact on patient care, it helped me, with my knowledge and experience in my current situation and circumstances".
The stance indicated a qualitative approach.

Many of the assumptions made and concepts used in the study came from previous research on information use in healthcare. This deductive approach enabled a hypothesis to be generated. Deducing a hypothesis for testing is more usually associated with the scientific, quantitative approach, but the ontology and epistemology made the nature of the inquiry qualitative.

3.3 Research method

There were three aspects to the study: understanding how information was actually being used in the organisation (including the perceived value or impact of that information to the user), identifying and understanding the organisational goals and then relating the information use to organisational goals.

Understanding how information was being used would involve observing or asking the appropriate population. Identifying organisational goals could be done by examining written organisational objectives and mission statements, attending open Board meetings and by asking the organisation's managers. Asking the managers would also add to the understanding of organisational goals.

To answer the research questions the study needed to identify not just *whether* something was happening, but explore *what* and *how*. This required a qualitative approach. The study was not to look at the impact of one variable on another, or establishing cause and effect, so did not require a quantitative approach with an experimental design (which was anyway contraindicated by the epistemology).

The intention was to collect both qualitative and quantitative data. The qualitative data would help develop an understanding of information use and organisational goals and how impact actually accrues. The quantitative data would provide information about the prevalence of particular types of impact, and (with an appropriate research sample and response rate) would be generalisable.

Conclusions drawn from the results could then be applied to the library service and used to guide developments, and findings might perhaps be transferable to other health library services. It was felt to be important to collect quantitative data to present a convincing picture to managers (important but very rare impacts may not demonstrate economic value).

3.3.1 Study design
The activities identified for collecting data indicated a qualitative design, either a case study or a survey (or cross sectional) design.

3.3.1.1 Case study
A case study, exploring in depth the use of information in a single case, or a few cases, was discounted. Although it would collect appropriate qualitative data, it

would not collect quantitative, generalisable data and would be more appropriate for a study that intended to generate hypotheses.

3.3.1.2 Survey or cross-sectional design

The survey design would allow a "snapshot" of reality at one point in time by collecting data on "a range of variables from more than one case" (Bryman, 2004) The design enables collection of qualitative and quantitative data for content analysis and statistical testing respectively.

Internal validity is weak in survey designs (can't establish cause and effect), but external validity is high (results can be generalised) if the sampling is randomised.

The survey design therefore seemed the most appropriate for answering the research questions, and for the ontological and epistemological stance. It was also the approach suggested in the literature (Urquhart & Davies, 1997; Weightman & Williamson, 2005)

3.3.2 Research strategy

Research strategies appropriate for a survey design included the use of focus groups, observations, interviews, questionnaires, and content analysis. Using more than one method to collect data would mean that the results could be triangulated, demonstrating internal validity. Inconsistent results could indicate bias in one of the methods.

3.3.2.1 Focus groups

Focus groups were initially considered, as they offered a "highly efficient technique for qualitative data collection" (Robson, 2002, p. 284). The known limitations or disadvantages include the need for focus group expertise (to reduce bias, and ensure the discussions remain relevant), attendance problems, and a large volume of data to collect at one time (Bryman, 2004; Robson, 2002). Focus groups were therefore discounted because of the lack of an experienced focus group facilitator (Kerslake & Goulding, 1996). Experience locally of poor

attendance at meetings and training sessions suggested that focus group attendance might also be low.

3.3.2.2 Observations

Observation would be an appropriate method for research into information seeking behaviour and information use in the real world. As observation is time consuming for the researcher, and would have been difficult to arrange in busy departments with data-protection and patient confidentiality issues, it was discounted.

3.3.2.3 Interviews

Interviews collect rich, qualitative data, but are time consuming. The question design is important to avoid bias in the questions and so an established interview schedule would be an advantage. Ideally, to avoid response bias, an interviewer would not be associated with the purpose or subject of the interview. Interviewing seemed appropriate for the study, particularly as a schedule, with some validation, was available from an NHS toolkit (Urquhart & Weightman, 2008).

The schedule included questions about the immediate impact of the information (as perceived by the interviewee) and any perceived future uses, thus recognising the complex nature of information use (uses may be multiple and vary over time). The schedule also included questions about information needs, resources used, and searching behaviour, and was focussed on a single information incident at a set time. The interview schedule was based in theory and developed from previous research, and therefore was designed to enable a rich picture of information use to be formed. This can be seen in terms of Dervin's work on sense-making (Dervin, 2003), and the study hoped to recognise a pattern in the information strategies utilised by the interviewees to bridge particular information gaps. This tool fitted the research needs.

3.3.2.4 Questionnaires

A postal questionnaire would enable the quick collection of a large amount of quantitative data. An appropriate sample would be required to enable the

generalisation of results to the wider population. The questionnaire could also include space to collect qualitative date. Using a previously validated questionnaire would reduce the likelihood of response bias by the use of leading or ambiguous questions. It would also save time as piloting of the questionnaire would not be required. Questionnaires were considered appropriate for the study, because it was important to establish the prevalence of various impacts. An added advantage was that the NLH toolkit included a validated questionnaire, which had been developed with the interview schedule. The questionnaire, like the interview schedule, included questions about information need, resources used etc. (not just questions about information impact and future use). This would build an understanding of each information incident.

3.3.2.5 Critical incident technique

The critical incident technique has been widely adopted in information use research (Urquhart et al, 2003). It would be used in the study because it was utilised by the questionnaire and interview schedule selected. The technique can use specific incidents or a series of incidents to extract rich data about circumstances, intention, context and behaviour. Focusing on a specific incident also aids recall and focuses respondents' replies, either for a questionnaire or an interview. Like the sense-making theory it assumes information behaviour varies not just in individuals, but over time and circumstances. Given similar "incidents" patterns of behaviour may be recognised.

3.3.2.6 Content Analysis

Content analysis is used to explore the data captured in documents, and is defined in three ways (Robson, 2002; Bryman, 2004). Relevant ideas or themes can be chosen in advance by the researcher and identified in the text (this also allows results to be quantified and is appropriate for a relativist, post-positivist approach). The text can be explored to generate themes and ideas (the ethnographic approach), or the language can be examined (semiotics). Content analysis can be a complex and time- consuming process. Content analysis, following the first definition, would be appropriate for this study to identify themes

from interview data and organisational documents. The researcher would be viewing documents from the perspective of library services. The themes that needed to be identified were those that could be supported through the library services mission (to provide or enable access to information).

The literature search had identified a possible tool, a taxonomy of library and information services (LIS) contributions to hospitals and academic health centres. As Abels indicated "the taxonomy and the CLIS approach may be adapted for communicating the value of LIS in other settings" (Abels et al., 2004).

Abels taxonomy identified three levels; mission concepts, organisational goals and LIS contributions. It provided a standardised language, developed from interviews with managers, which could be used to identify and organise the relevant themes, ideas and concepts in a document.

In addition the perceived uses and impacts of information, identified from the study and expressed in value-in-use terms (improved decision making, improved quality of care etc.) could be mapped against organisational goals.

Adding quantitative data would demonstrate the prevalence of the contribution. In essence the taxonomy could be used to construct a shared understanding of the *value of information* and link it to library services.

There was potential for bias in content analysis (particularly by a single researcher) but it was hoped that using a validated taxonomy would reduce bias and add to the validity of the study.

3.3.3 Chosen research strategy

Having selected the appropriate study design, a survey, part of the research strategy was to make use of existing tools where possible. The added advantage was that by using standard questions then benchmarking and service

comparison might be possible. The lack of validated questionnaires and other measurement tools in library and information sciences is marked, particularly in comparison to the healthcare field generally.

To carry out the survey three methods were used:

face to face interviews

a questionnaire

content analysis.

The collection and analysis of the data from interviews is time-consuming, particularly for single researchers (Section 3.3.2.3). To keep the process practical, and within a reasonable time frame, it was decided to interview only six individuals. Three of these were opportunistically selected library members interviewed about information use, and three managers selected by role from the Trust Board who were interviewed about organisational goals.

3.3.3.1 Information use

Interviews and the use of a structured questionnaire were used to collect the data. Tools identified from the literature search were used for both (Section 3.3.2.3, 3.3.2.4). See Appendices 4B and 3A for the interview schedule and questionnaire, practical procedures are detailed in Section 3.5.

A postal questionnaire, rather than an online version, was chosen because the library service did not have access to relevant email addresses.
There is guidance in the literature on best practice to improve postal questionnaire response rates (Edwards et al., 2007). Monetary incentives were not used (lack of resources) but other recommendations were followed. This included the use of headed paper, an indication of the benefits to respondents, reassurance about anonymity, and follow up contact with a second copy of the questionnaire. Addressed return envelopes were used, unstamped as the courier service was available and work addresses were used.

3.3.3.2 Organisational goals

Interviews were used to collect the data about organisational goals or objectives. As the literature search had not identified a relevant interview schedule, a semi-structured interview schedule was designed (Appendix 4C). Questions covered key organisational objectives, the perceived potential contribution of the library service, and expectations on service measures (more details in Section 3.5).

The organisation had a documented, shared vision of what it needed to achieve in the annual plan. As collecting (and then handling) data from Board meetings, and analysing the range of corporate documents was not practical within the available time and resources, it was assumed the annual plan was an accurate reflection of organisational goals. The data could be triangulated with the interview data.

3.4 Sampling

The population surveyed about information use consisted of all members of the Rosewell library. Although the library service is based on two sites it was not practical to obtain library membership details from the site jointly managed by the NHS and a University. The University-led library used different library management software, and data was managed by the University. Concerns were expressed about data-protection, as the consent to hold personal data, given to the University, did not cover its use by another organisation for research. A pragmatic decision was made to confine the study to a single Conquest site served by the Rosewell Library.

A larger, multiple site survey would have been preferable for generalising the results. There was a theoretical possibility that the Conquest hospital site had confounding factors that a multiple-site survey may have flagged up, however randomising the sample would have reduced the likelihood of that.

3.4.1 Questionnaire sample

The total population for this part of the research study was the membership of the Rosewell Library, namely 2604.

To enable generalisation of the results from the sample to the total population of 2604, the optimum sample size was calculated using an online site. The site was found by searching Google with " sample size calculator" and checking the site was hosted by a creditable organisation http://surveysystem.com/sscalc.htm The sample size needed to be as small as possible (for practical purposes) while providing results which could be generalised using a valid statistical model. The confidence level was set at 95%, the confidence interval at 12.51, which provided a practical sample of 60.

This meant that the study results could be generalised with a reasonable degree of statistical confidence. If 40% of responders said that they used information provided by the library for patient care, we could be 95% confident that between 27% and 53% (40% +/- 12.51) of the whole population would respond in the same way. A smaller confidence interval would have been better, but a larger sample size was not manageable within the existing resources.
Library members' names and contact addresses were extracted from the library management system into an Excel spreadsheet. The data was obtained by running a report to retrieve all current membership numbers. The order of the data was not specified, but left as computer-driven. The order could not be identified, so did not seem likely to introduce selection bias (e.g. it was not by surname or entry date).

The next step was to identify 60 random numbers. This was done by using an online random number generator (found by searching Google for "random number generator").

The 60 numbers generated were matched against the number in the first column of the Excel spreadsheet and the corresponding name and contact details selected.

3.4.2 Interview sample (organisational goals)

Three members of the Trust board were chosen for their role: clinical governance, operational clinical services, and the chief executive. The names were then checked against the questionnaire sample, to avoid approaching the same people twice. All three were members of the library although this was not a requirement.

The rationale for the purposive sample was as follows. The chief executive of the Trust is ultimately responsible for agreeing and achieving organisational goals, operational clinical services are the core business of the Trust, and clinical governance involves library services and information management closely.

As the interviewer was part of the library service, both interviewer bias and response bias were minimised by keeping questions focused on organisational goals.

3.4.3 Interview sample (Information use)

This was an opportunistic sample of three. Two people were asked as they entered the library if they would agree to be interviewed, and a regular library user was phoned. All three agreed, and confirmed they had not received a questionnaire. The non-randomisation and small sample size meant results could not be generalised, but findings could be compared with the questionnaire results to help internal validity.

As the interviewer was known to the interviewees, there was the problem of response bias, but interviewees may also speak more frankly if they feel that their views may influence changes in the service. A shared understanding in such situations is easier to obtain.

3.5 Practical research process

3.5.1 Questionnaires
The toolkit questionnaire was slightly adapted (Appendix 3A). A question was added at the beginning to identify the main base site of the respondents (to help identify cross- site library membership).

An additional option of *other (please state)* was added to the question *Which best describes your job?*

The toolkit questionnaire is worded to emphasise the impact of information on clinical patient care. Slight changes were made for the purposes of this study to capture non-clinical aspects of information use (immediate impact or future use). The changes are detailed in Appendix 3B.

The questions and options were numbered and some responses coded for easier data entry.

A new Excel spreadsheet was set up giving each of the selected library members a number from 1-60. The questionnaires were numbered 1 - 60.

The names and contact details were exported into Word and a mail merge set up, from which labels were printed for the envelopes.

Each envelope contained a letter on headed paper explaining the purpose of the questionnaire (Appendix 3C), a return addressed envelope, and the appropriately numbered questionnaire. A two week return date was specified in the letter.

The researcher had no further access to the list matching names to questionnaire numbers. The respondents could then be reassured that their responses were anonymous, and so may perhaps have felt able to respond truthfully.

On return the questionnaires were checked off against the numbered list by a library assistant. After the deadline the library assistant was able to identify non-

returns and send out a follow-up letter. The letter (Appendix 3D) reassured respondents that their returns would be anonymous to the researcher.

A total of 38 were returned, 23 initially and 15 after the reminder letter was sent (63%).

3.5.2 Interviews (information use)

The purpose of the study was explained and written consent was obtained at the beginning of the meeting (Appendix 3E), including permission to tape responses. The third library member was contacted by phone and gave verbal consent. None of the information-use interviews were in fact taped (technical problems).

The structured interview schedule from the tool-kit was used, with questions already designed to guide the interview and collect relevant data (Appendix 4B). The schedule had some preliminary validation, and was not altered for the study.

Notes were taken throughout, and the interviewee thanked at the end. Interviewees were reassured that the use of any quotes would be checked with them before use.

3.5.3 Interviews (organisational objectives)

The three selected Board members were contacted by email with an invitation to interview, including the purpose of the study. The email suggested a 15 to 30 minute meeting. Written consent and permission to tape were obtained at the beginning of the interview.

All three board members agreed to be interviewed. All interviews were taped and notes taken throughout. The interviews were semi-structured, with only 4 questions to guide responses (Appendix 4C).

After the interview all participants were emailed with thanks and reassurance that use of direct quotes would be agreed with them first.

3.6 Handling the data

3.6.1 Handling the data from the questionnaires

SPSS was selected to handle the quantitative data collected on the paper questionnaires. SPSS is specifically designed to deal with quantitative data, it was readily available in the library, and enabled data quality checks (an advantage over Excel). Excel was also used to produce some of the final tables, and could have been used throughout as no complicated statistical tests were run.

To ease data entry the answers were coded on the questionnaire and a simple code guide produced (Appendix 3A).

A variable was set up for each possible response on the questionnaire, and the data keyed in by the researcher. The specific values set up for the variables prevented miss-keying of data, and missing data could be identified. The descriptive tables produced when analysing the data would identify inconsistencies and missing data.

Data quality was therefore supported, but as the same single researcher collected and entered the data there was a potential for data manipulation. To enable future checks the researcher retained the questionnaires, together with an electronic copy of the SPSS data, in a secure area.

3.6.2 Handling the data from the interviews

The intention was to take notes during the interview and use the tapes as a reminder and to check quotes. Taping was not used in the information-use interviews because of problems with the recorder.

The written notes were read through and key points and quotes were transcribed.

3.6.3 Content analysis of the organisation's annual plan

The top level "mission concepts" were colour coded, and the organisational goals given a number (Appendix 3F). Objectives, goals and aims in the strategy were coded appropriately by the researcher. It was not possible to enlist another coder to check the validity of the coding

The colour coding was also used on the organisational interview notes to extract quotes for the presentation of data.

3.7 Ethics

Bryman (2005) summarises the four main areas to consider: whether there is harm to participants, lack of informed consent, invasion of privacy or deception.

As the research study was an exploration of current services, it did not require formal NHS ethical approval from the National Research Ethics Service. In line with organisational procedures the local ethics committee was contacted. The committee confirmed that NHS ethical approval was not required, and registered the research.

One ethical concern was the possibility that results could indicate that information provided by the library service did not contribute to organisational goals, and that the library had no value. The implications for the local service would be high, but the risk was low as previous research provided evidence to the contrary. The existing research evidence also meant that adverse outcomes from this study would be unlikely to have broader implications for NHS libraries.

A research study would be unethical if it produced misleading or untruthful results. This could be the result of an inappropriate research method or unethical practices in the research process, including the accidental or deliberate distortion of the data. As the research approach and methodology were based on existing research, the study design fitted the ontological and epistemological stances taken, it was therefore unlikely that the study design in itself would produce

misleading results. The use of more than one data collection method would hopefully identify any anomalies in the data.

Another ethical issue was the lack of independence in the research team as the researcher was also a member of the library service being studied. This was unavoidable and, as indicated in Section 3.5 and earlier sections, steps were taken at all stages to limit bias, protect anonymity and ensure informed consent.

There is an ethical requirement to protect the study participants. The interviewees, who could not remain anonymous, might express views that were unwelcome by the organisation, or might be misrepresented. The interviewees were reassured that their quotes would not be directly attributed, and quotes were checked with them before inclusion.

To prevent the data being tampered with, to remain compliant with the data-protection Act, and safely retain the data for future validation, all data and process documentation were kept securely, in locked cabinets or (for electronic documents) in password protected folders on secure drives.

As there is an ethical responsibility to make results available, the study will be put on the organisation's internet, and a copy placed in the library. The results will also be shared at NHS Library service managers meetings. Publication of the study results may be possible.

4. Chapter 4. Results

4.1 Introduction to chapter four

This chapter sets out the data collected using the questionnaire, interviews and content analysis. Results are summarised and interesting or significant points identified for discussion in Chapter 5.

The calculations used to generalise results are in Appendix 4A

4.2 Results from the questionnaires

Sixty questionnaires were sent out and a total of 38 returned, just over 63%. Of these, 23 were returned within the initial two week deadline. Sending a reminder resulted in a further 15 returns.

Question 1 Which site are you mainly based at?

Table 1. Site

Site	Frequency	Percent
Conquest	36	94.7
Eastbourne	1	2.6
Other	1	2.6
Total	38	100.0

As the sample was taken from Rosewell library membership files, it was expected that most respondents would be mainly based at the Conquest site where the library is located. This proved to be the case (36/38). One respondent had a base at both sites and ticked "other".

Question 2 Which best describes your job?

Table 2 Job Role

Job role	Frequency	Percent
consultant	2	5.3
GP	1	2.6
other medical and dental	11	28.9
qualified nurse or midwife (acute)	11	28.9
qualified nurse or midwife (community)	4	10.5
qualified scientific or technical	2	5.3
support staff	1	2.6
other admin	2	5.3
other	4	10.5
Total	38	100.0

The majority of respondents were doctors or nurses, which reflects the pattern of library membership. Four respondents ticked "other" and stated their roles as a "student nurse", an "educationalist in nursing and midwifery", an "other healthcare professional" and a "health care assistant."

Question 3 Why did you need the information?

Table 3 Information need/purpose

Need/purpose	Frequency (more than one option could be ticked)	Percentage respondents (n=38)	Percentage sample (n=60)
Continuing professional development	16	42.1%	26.7%
Direct patient care	14	38.6%	23.3%
Personal research	9	23.7%	15.0%
Personal interest	8	21.1%	13.3%
Teaching/supervision	6	15.8%	10.0%
Clinical governance/guideline development	6	15.8%	10.0%
Service development	4	10.5%	6.7%
Audit	2	5.3%	3.3%
Legal/ethical issues	2	5.3%	3.3%
Funded research	2	5.3%	3.3%
Other	1	2.6%	1.7%

To generalise the statistics robustly from our sample to the population of library users, the calculations should be based on the total sample, not just the respondents. The assumption is made that the non-respondents would have answered negatively. Our sample was 60 with a confidence interval of 12.51. We can therefore state with 95% confidence that between 14.29% and 39.21% (26.7%+/- 12.51) of our population would respond that they needed information for continuous professional development, i.e. between 371 and 1021 individuals. Similarly we can state with 95% confidence that between 281 and 933 individuals from our population of library users would respond that they needed information for direct patient care for any particular information search.

It can also be stated with 95% confidence that between 2.5% and 27.5% of all library users would identify that information was needed for personal research when asked about a recent search.

Library users often needed information for more than one purpose (total number of purposes was 70).

Question 4 What type of information did you require?

Table 4 Information type required

Information type required	Frequency (more than one option could be ticked)	Percentage of respondents (n=38)	Percentage of sample (n=60)
Guidelines on management of illness/condition	18	47.4%	30.0%
Most recent information on the subject	18	47.4%	30.0%
Background information	11	28.9%	18.3%
Specific drug or therapy related	8	21.1%	13.3%
Other type of information	8	21.1%	13.3%
General policy documents	5	13.2%	8.3%
Methods used	4	10.5%	6.7%
Information for a patient	3	7.9%	5.0%
Results obtained (including adverse effects)	2	5.3%	3.3%
Confirmation of initial diagnosis	1	2.6%	1.7%
Contact, organisational details	0	0.0%	0.0%

The type of information most frequently required (47% of respondents) was either guidelines on management of an illness or condition, or the most recent

information on a subject. No-one identified a requirement for contact or organisational information. Eight respondents (21.1%) indicated that another type of information was required, one identified this as "NVQ".

Generalising the data as before (see Appendix 4A) we can be 95% confident that between 17.49% and 42.51% of library users would respond in the same way (between 455 and 1107 individuals) and require guidelines on management of an illness/condition, or require most recent information on a subject.
More than one type of information was required by the users in their search.

Question 5 What resources/sources did you use to try and find the information?
Table 5 Resources/sources

Resources/sources used	Frequency (more than one option could be ticked)	Percentage of responders (n=38)	Percentage of sample (n=60)
Internet (Google etc)	27	71.1%	45.0%
Databases (medline etc)	18	47.4%	30.0%
Library staff	15	39.5%	25.0%
E-journals	12	31.6%	20.0%
Local health library	12	31.6%	20.0%
Reference textbooks/manuals	10	26.3%	16.7%
ESHT library website	9	23.7%	15.0%
Colleagues	7	18.4%	11.7%
National Library for Health	7	18.4%	11.7%
Personal journals/book collection	6	15.8%	10.0%
E-books	5	13.2%	8.3%
Other libraries	4	10.5%	6.7%
Other sources	3	7.9%	5.0%

The internet was used by 71.1% of respondents (45% of the sample) the most frequently used resource by quite a large margin. This was followed by databases (47.4%) then library staff (39.5%)

Although more than one resource was used (on average), the use of e-books was low.

Question 6 Were you successful in obtaining the information?

No-one was unsuccessful

Table 6 Degree of success obtaining information

Degree of success	Frequency	Percent
wholly	26	68.4
partly(incomplete)	9	23.7
partly (time)	3	7.9
Total	38	100.0

The majority of respondents (68.4) were wholly successful in obtaining

information. The percentage for the whole sample was 43%.

It can be generalised with 95% confidence that between 30.49% and 55.51% of

the population of library users would be wholly successful obtaining information

(between 762 and 1,445 individuals). Lack of time did not appear a major

problem.

Question 7 What was the immediate impact of the information provided on your knowledge?

Table 7 Immediate Impact

Immediate impact	Frequency (more than one option could be ticked)	Percentage of responders (n=38)	Percentage of sample (n=60)
Information was relevant	30	78.9%	50.0%
Information was accurate	24	63.2%	40.0%
Information was current	24	63.2%	40.0%
Contributed to higher quality of care	23	60.5%	38.3%
Provided new knowledge	22	57.9%	36.7%
Will share information with colleague	20	52.5%	33.3%
Refreshed memory about detail or fact	19	50.0%	31.7%
Substantiated prior knowledge or belief	19	50.0%	31.7%
Better informed decisions	19	50.0%	31.7%
Saved time	14	36.8%	23.3%
Other	3	7.9%	5.0%
Found little or nothing of clinical value	2	5.3%	3.3%

Relevance, accuracy and currency were the most frequent responses, and multiple responses were common.

Although "Saved time" was low in the ranking, 36.8% of respondents perceived this as an immediate impact of the information obtained. Generalised from the sample of 60, it can be stated with 95% confidence, that between 10.79% and 35.8% of the library user population would respond that the impact was "saved time" (281 to 933 individuals or between approx. 11% and 37% of the Conquest workforce).

Information provided "contributed to higher quality of care", (38.3% of the sample). It can be stated with 95% confidence that between 25.79% and 50.81% of the population of library users would respond in the same way. This translates to between 672 and 1323 individuals which is between 27% and 52% of the Conquest workforce.

Table 7a summary of the results generalised to the population (2604)

It can be stated with 95% certainty that the whole population of library users would respond in the same way, and identify the impact of the information was as follows:		
% of library users between the range	*Lowest %*	*Highest%*
Contributed to higher quality of care	25.79	50.81
Provided new knowledge	24.19	49.21
Will share information with colleague	20.79	45.81
Refreshed memory about detail or fact	19.19	44.21
Substantiated prior knowledge or belief	19.19	44.21
Better informed decisions	19.19	44.21
Saved time	10.79	35.81

Question 8. Did you ask a librarian to search for you instead, or in addition to your own searching?

Table 8 Mediated searching

Asked librarian to search	Frequency	Percentage of respondents (n=38)	Percentage of sample (n=60)
Yes	18	47.4%	30.0%
No	20	52.6%	33.3%

Just under half (47.4%) of respondents asked a librarian to help with the search, more did not and chose to search themselves.

Question 8a. If so, why?

Table 8a Reasons for mediated searching

If so,why ask a librarian?	Frequency	Percentage of actual respondents (n=18)	Percentage of potential respondents (n=38)	Percentage of sample (n=60)
save time	8	44%	21.1%	13.3%
improve the search	7	39%	18.4%	11.7%
other	3	17%	7.9%	5.0%

Of the eighteen respondents for whom this question was relevant, the split was fairly even between saving time and improving the search. The response was too small to generalise the result, but indicative for service promotion. Three respondents identified they had "other" reasons to ask the Librarian, but only one specified the reason "on occasion I struggle with finding my way around the internet."

Question 9 If you searched yourself, how long did the search take overall?

Table 9 Time spent searching

		Frequency	Percent
Valid	<10 mins	7	18.4
	>10 mins < 30 mins	14	36.8
	> 30 mins < hour	4	10.5
	>hour	12	31.6
	Total	37	97.4
Missing	9	1	2.6
Total		38	100.0

Most respondents took less than half an hour, or over an hour.

The question had not been answered by one respondent.

10. how might the information you obtained contribute now (or in the future) to your decisions? It may help – or did help-in…

Table 10 Future uses/contribution

Contribution: It may help, or did help in...	Frequency (more than one answer could be ticked)	Percentage of respondents (n=38)	Percentage of sample (n=60)
Personal and professional career development	25	65.8%	41.7%
Advice to colleagues	15	39.5%	25.0%
Revision of clinical pathway or guidelines	13	34.2%	21.7%
Advice to patients/carers	13	34.2%	21.7%
Changes to service delivery or practice	10	26.3%	16.7%
Improved quality of life for patient and/or family	8	21.1%	13.3%
Improved performance in day-to-day work (non-clinical)	7	18.4%	11.7%
Confirmation of proposed drug therapies	6	15.8%	10.0%
Legal and ethical issues	6	15.8%	10.0%
Minimise risks of treatments	6	15.8%	10.0%
Choice of diagnostic tests	5	13.2%	8.3%
Other contribution	5	13.2%	8.3%
Choice of non-drug therapy	4	10.5%	6.7%
Choice of drug therapy	0	0.0%	0.0%

Personal and professional career development was most frequently ticked (65.8% of respondents, 41.7% of the sample), followed by advice to colleagues (39.5% of respondents, 25% of the sample) and revision of clinical pathway or guidelines (34.2% of respondents, 21.7% of the sample).

Five respondents ticked "other" contributions, but only one respondent identified what that was, in this case "audit".

Table 10a Summary of results generalised to the population (2604).

It can be stated with 95% certainty that the whole population of library users would respond in the same way, and identify that the information may help, or did help with….		
% of library users between the range	*Lowest*	*highest*
Personal and professional career development	29.2%	54.2%
Advice to colleagues	12.5%	37.5%
Revision of clinical pathway or guidelines	9.2%	34.2%
Advice to patients/carers	9.2%	34.2%
Changes to service delivery or practice	4.2%	29.2%

11. What are your opinions on aspects of information seeking?

Table 11 Opinions on information seeking

Opinions on information seeking	Frequency (more than one option could be ticked)	Percentage of respondents (n=38)	Percentage of sample (n=60)
Prefers to do own searching	22	57.9%	36.7%
sometimes prefers to asks a librarian	19	50.0%	31.7%
Feels competent at searching e-resources	8	21.1%	13.3%
usually needs information urgently	8	21.1%	13.3%
Works with colleagues to search	3	7.9%	5.0%

Over half the respondents (57.9%) preferred to do their own searching, but half sometimes prefer to ask a librarian.

4.3 Results from the interviews about information use

The interviewees were two nurses and one allied health professional. The notes from the interviews are included in Appendix 4B.

The interview responses matched well with the questionnaire results, thus adding to the internal validity of the study and providing additional validation for the interview schedule and questionnaire. The responses expanded on the questionnaire results, and provided information for library service development.

Constraints on searching were time, and problems "sifting through the information to get what you want". There was little time for reflection as the department was often short staffed and "fire fighting not reflecting". Information was shared through training and meetings, and a greater level of sharing was indicated than was shown from the questionnaire results.

An interesting point was that the impact of information could be an increase in the cost of patient care (rather than a decrease). The emphasis was on patient safety and the balances of cost-effectiveness of care. Librarians were perceived to have more expertise in searching, and would be asked to check searches, or undertake searches for "formal" studies.

The importance of international links was identified "expanding how we do things", and the bias it introduces in excluding foreign language research because we lack translation services.
The responses suggested a range of understanding about critical appraisal and how to assess the accuracy of information obtained.
The library had a "central role" and acted as a starting point. Obtaining articles was identified as a contribution to their information seeking.
A library on site was seen as an advantage, and that it was easier to work in the library than at home or in the office, so computer access is important. The library needed to be open outside of office hours.

4.4 Results from the interviews about organisational goals

The notes from the interviews are included in Appendix 4C.

Question 1. What would you consider the key objectives for the organisation at the moment?

All three identified achieving Foundation Trust status as an objective. The other objectives were specific to their roles.

Staff and staff development were highly valued by all interviewees "for me the organisation equals staff. With a competent, happy and informed staff then patient care will be the best that we can make it". Two interviewees identified that the organisation, and the NHS itself, had a willingness to develop and train staff: "feel the NHS enables you to come into it with nothing but it can direct you as long as you want to be directed and are open minded enough to see the potential in yourself"

Excellent clinical care was the underlying theme in all three interviews.

Question 2. How do you think the library service could contribute to those objectives?

One interviewee used the library services regularly, two did not. All three recognised the library's value for learning and development, supporting personal development and organisational change. Two identified a role supporting direct business and specified marketing. One identified alerting and horizon-scanning. One emphasised the need for library services to take a "more involved and assertive role" in the organisation.

Question 3. What indicators or measures would demonstrate to you the contribution of library services?

The difficulty of measuring library impact was recognised by two respondents. All three identified the need for more than one approach and both qualitative and quantitative evidence, using the terms "hard" and "soft" measures. One identified the need for financial measures, two mentioned benchmarking.

One identified that impact rather than activity needed to be shown. *"I'm not interested in how many books or how many articles or how many this, or how many that- I'm not interested in that at all. What I'm interested in is - what difference did it make"*

One stated :*"proof of the pudding is in the eating, the first time I get something from the library that I can pick up and grab"* will be a measure of library value. Two mentioned non-users and the opportunities of new technology. One identified decision making as an impact to measure*: "your (the library) objective has got to be around the decision that the person makes."*

4.5 Results from the content analysis of the organisation's annual plan

The key document used was the Annual plan for 2008/9 (Appendix 4D). Abels taxonomy (Abels et al., 2004) was used to identify and code themes. There were no themes identified that did not fit the taxonomy. The frequency with which themes occurred was counted to get an indication of the importance of various goals to the organisation. Aims, values and goals that related to excellent clinical care were most frequent (26 occurrences) followed by increasing profitability (16), then meeting standards (11). A specific goal for the organisation was to gain Foundation Trust status. Also reflected was the nationally set programme "creating an NHS fit for the future". The terminology was of achievement, improvement, achieving the best, efficiency, safety and quality.

4.6 Presenting the results using an existing taxonomy

The following table (Table 11) summarises the findings and triangulates the findings from the questionnaire survey with the managers' comments, using the taxonomy to relate impacts to organisational goals. The library users' comments mirrored the questionnaire findings – expanding and explaining some of the findings in more depth.

Table 12 The use made of information related to organisational goals

Organisational mission concept	Organisational goals With quotes from interviewed managers and annual strategy	Survey results from Library users showing the **Need/ Immediate Impact /future use** of information. The % is of the total sample (n= 60)
Clinical care	Provide excellent clinical care *"reduced waiting times"* *"improved clinical care"* putting patients first	For direct patient care 23.3% Contributed to higher quality of care 38.3% Better informed decisions 31.7% Choice of diagnostic tests 8.3% Choice of non-drug therapies 6.7% Minimisation of risks of treatment 10% Confirmation of proposed drug therapies 10%
	Promote clinical learning *"organisational development programme"*	For audit 3.3% Clinical governance/guideline development 10% Teaching/supervision 10% Provided new knowledge 36.7% Will share information with colleague 33.3% Substantiated prior knowledge or belief 31.7% Better informed decisions 31.7% Revision of clinical pathway or clinical guidelines 21.7%
Management of operations *Achieve Foundation Trust status* *Fit for the future*	Make sound management decisions "decisions made by service users"	For service development and planning 6.7% Provided new knowledge 36.7% Refreshed memory about detail or fact 31.7% Substantiated prior knowledge or belief 31.7% Better informed decisions 31.7% Improved performance in day-to-day work (non-clinical) 11.7%
	Increase profitability *"best use of resources"* *"good financial control"*	Saved time 23.3%
	Meet accreditation standards *Delivering quality*	For clinical governance/guideline development 10% For audit 3.3% Contributed to higher quality of care 38.3% Revision of clinical pathway or guidelines 21.7%
	Reduce corporate risk *Managing and mitigating all risks effectively*	For clinical governance/guideline development 10% For legal ethical issues 3.3% Contributed to higher quality of care 38.3% Revision of clinical pathway or guidelines 21.7% Legal and ethical issues 10%
	Provide an organisational learning environment *"education is clearly important"* *"competent, informed happy staff"*	Continuing professional development 26.7% Personal research 15% Personal interest 13.3% Provided new knowledge 36.7% Will share information with colleague 33.3% Refreshed memory about detail or fact 31.7% Substantiated prior knowledge or belief 31.7% Better informed decisions 31.7% Personal and professional career development 41.7%

	Foster satisfaction among current staff *"competent, informed happy staff"* *Acting with integrity* *Speaking well of each other*	For personal interest 13.3%
	Foster institutional attractiveness	Continuing professional development 26.7% Personal research 15% Personal interest 13.3% Personal and professional career development 41.7%
Education	Provide excellent educational programs *"well trained and dedicated staff"*	Continuing professional development 26.7% Personal and professional career development 41.7%
	Provide resources and services necessary for teaching and learning *advantages to staff of on-site educational resources*	For personal research 15% For teaching/supervision 15.8% Will share the information with colleagues 33.3% Advice to colleagues 25%
Research and innovation	Foster research	For funded research 3.3% For personal research 15%
	Adopt innovative technologies and practices *"we have to get better at capturing developing technologies"*	For funded research 3.3% For personal research 15% Changes to service delivery or practice 16.7%
Service	Improve lives of patients and families *"we need to identify what is important to that individual and making sure we do it"*	Direct patient care 23.3% Improved quality of life for patient and/or family 21.1% Advice to patient/carers 21.7%
	Improve lives of community members "partnership working"	Improved quality of life for patient and/or family 21.1% Advice to patient/carers 21.7%

5. Chapter 5. Discussion

5.1 Introduction to chapter five

This chapter reviews the results to gain a picture of how information is being used in the organisation, and how this use relates to organisational goals. Any unexpected or new evidence is identified.

5.2 Discussion of the Information use results

5.2.1 Base site
All three interviewees and most the questionnaire respondents were based at the Conquest site. This result was expected because the sample was taken from Rosewell Library files on the Conquest site. The organisation is based on two acute sites at Hastings and Eastbourne. Both sites have a library, with travel between sites of up to an hour. Only one respondent was mainly based at the Eastbourne site, and one based on both sites. This supports the idea that individuals use the most local library. Another interpretation could be that staff are unaware they can join both libraries. It would be interesting to identify how many staff are members at both libraries.

5.2.2 Role
It was expected that respondents would be mainly doctors, nurses or midwives and this proved to be the case. It reflects the results of previous research and the pattern of library membership. The result confirms that the sample was reasonably representative of library membership. Of the interviewees, two were nurses, one an allied health professional.

The implications could be that other staff groups have no need to use the library, or are unaware that they can, or the library does not provide services and resources relevant to them. The last two points seem most likely, reflecting the historical background of many NHS libraries. The majority were founded by (and for) doctors or nurses, and funded for those groups.

5.2.3 Information needs
This was considered a key question as it indicated information use. As the questionnaire was based on previous research, the question on information needs covered the expected responses and left the option for other needs to be specified. The interview schedule question about information need was completely open, and so did not lead the interviewee. No additional information needs were identified through either the questionnaire or interviews. The

responses from interviewees about their information needs directly echoed the most frequently cited needs in the questionnaire (professional development and patient care).

This result indicates that the information needs of library users in the healthcare environment have been well established by previous research.

The results are useful for understanding the motivation of information users. The frequency with which the needs were expressed can suggest the priority given to aspects of the library service.

The results show that more than one information need was expressed. It could be that continuing personal or professional development is implicit in all information needs. It could be because some of the options are not mutually exclusive, or that more than one information need is often present on a single occasion.

Another interpretation is that respondents did not read the question and did not focus on a single occasion. The three interviewees, who had been personally asked to consider a single occasion, gave only one specific need.

5.2.4 Information type

The results indicated that *guidelines* and *recent or background information* were most frequently required. This result provided some internal validation of the data as it tied in with the answers about information need. Information for direct patient care is often found in guidelines, so a frequent requirement for guidelines is consistent with a frequently expressed need for information on patient care, and requiring *recent* information is arguably consistent with a personal or professional development need.

The relevant question on the questionnaire included 11 information types. Two of the options (*information for a patient* and *confirmation of initial diagnosis*) seemed

more relevant to use (either immediate impact or future use), but it was unclear how respondents interpreted the question.

The information types identified in the question were not mutually exclusive. M*ost recent information*, could also be *drug or therapy related information*, and both could be *guidelines.* Guidelines can also be a format. This question appeared to confuse *information-as-thing* and *information-as-knowledge*, so it was difficult to get a clear sense of what was happening.

Eight respondents (21%) indicated that an o*ther* type of information was required, however the only other specified type was "NVQ". This could be interpreted as "the type of information suitable for an NVQ", or could further indicate an unclear question in that *NVQ* would be the *need* or *use* not the *type.*

The interview schedule asked what information had been found, rather than enquiring about specific information types. Two of the interviewees stated they found references (to articles). Three comments added to the questionnaire (in response to other questions) also mentioned article references and the use of the library to get the full text. This is an aspect of library use that the questionnaire could miss, although the interview schedule potentially would identify this need.

There was no requirement for *contact or organisational details*. It was an unexpected result, as previous research had identified a requirement for this type of information (Urquhart et al., 2007). It could be that situation affects the requirement, and a work-based observation, less linked to library services, would have a different result. The make-up of the sample may also affect the result (e.g. if the sample included more administrative staff).

The questionnaire results showed that more than one information type was required. This could reflect a genuine requirement during an episode of

information seeking, the nature of information in that it falls into more than one type, or may be the result of ambiguity in the question.

5.2.5 Resources used

As expected the internet was the most used resource (71% of respondents, 45% of the sample). All the options offered in the questionnaire were selected at least three times which suggested previous research had identified the main resources used, and that Rosewell library users were no different. Three respondents indicated that *other* resources were used but did not specify what they were.

A welcome result for this study was the frequency with which library staff was identified as a resource (39.5% of the respondents, 25% of the sample). E-books were not used often. This result was expected as the library service has not made e-books available or marketed the e-books available through the National Library for Health (now NHS Evidence). Evidence from the academic sector suggests the use of e-books is increasing when core titles are available electronically (Joint, 2008).

The interviewees all used the internet, two used multiple resources. Findings show that a range of resources are still used, not just the internet.

One interviewee had used the organisation's Intranet, which was the only resource not identified elsewhere.

5.2.6 Success

All were successful, or partially successful in their search. This could be because searches were not attempted unless individuals expected to be successful, something that Gorman and Helfand (1995) found in their research on information seeking in primary care. The only unexpected result was that only 3 respondents identified time constraints had been a factor in achieving success. Previous research suggested that lack of time was a barrier. It may be that time factors did not impact on the success of specific searches but there is generally a

lack of time for information seeking and reflection. This view is supported by comments from the interviewees.

5.2.7 Immediate impact on knowledge

This was considered a key question for the research study as it directly identified the use made of information as perceived by the information user.
The number of responses to the question showed that the impacts were multiple, providing further evidence of the complexity of information use.

The questionnaire results reflected previous research. The information provided contributed to higher quality of care, provided new knowledge, would be shared, refreshed memory, substantiated prior knowledge, contributed to better informed decisions and saved time. There were no unexpected results, although three respondents identified *other* impacts but did not specify what they were.

The questionnaire results showed that over 60% of respondents perceived that the information provided "contributed to higher quality of care". Using a robust statistical calculation this data was generalised to the study population. From the resulting picture (see chapter 4 table 7a) some impressive statements could be made. It could be claimed that 26 -51% of Rosewell library members (672 -1323 individuals) were using "information provided" to *contribute to higher quality of care*. 1323 individuals represent around 52% of the Conquest workforce. Between 11% and 36% of library users *saved time* through the impact of information provided (286 - 947 individuals).

Several respondents seemed to have difficulty completing the question, as ticked options were crossed out and corrected. The options that information was *relevant, accurate,* and *current* are information qualities not impacts and this may have caused confusion.

The interviewees' responses were consistent with those from the questionnaire. One interesting point was made about the impact on the cost of patient care. There is a possibility that information which led to a change in an intervention would increase the identifiable costs.

5.2.8 Asking the Librarian to search & Opinions on searching
Just over half the questionnaire respondents did not ask a librarian to help with the search. It is difficult to interpret the implications of this without qualitative data, and the results from question 11. The interviewees also searched themselves, but would ask a librarian if circumstances required it (for example if they wanted their search checked). This result is consistent with the questionnaire data that half of the respondents "sometimes" prefer to ask a librarian.

Although nearly 60% of respondents preferred to do their own searching, only 21% felt competent searchers. The majority of respondents were successful in obtaining the information they needed, and so they did not fall into the category of confident-but-incompetent searchers.

The results showed that when the librarian was asked it was because it saved time or improved the search. This could be used to argue the value of the librarian, but assumes the search really was improved, and librarian time was cheaper than requester's time. The three respondents who had *other* reasons for asking the librarian did not specify what they were.

The overall picture suggests the librarian's role is less that of the primary searcher (unless time is short), but that of an expert to check or confirm results. The data supports the idea that it rather depends on the nature of the search.

5.2.9 Search time
The results from the questionnaire showed most searches took under 30 minutes, or over an hour. It is difficult to make use of this result, but, put with the

interview data, the implication is that searching is complex. Once again it depends on the nature of the search topic and the setting for intended use.

5.2.10 Future use
This was considered a key question for the study. The results were consistent with the pattern of information need and reflected the results of previous research. The data gives a clear picture of how information provided was likely to be used in the future. As expected, personal and professional development was frequently identified, and various aspects of patient care. Five respondents ticked *other* which suggested some potential uses had been missed, but only one specified this use as *audit.* Audit was an option for information need (question one) so perhaps could have been included here.

The responses from the interviewees showed a similar pattern for future uses (future decisions and development of care). Additional options had been added to this question: *personal and professional career development* which was chosen by 41.7% of the sample and *improved performance in day-to-day NHS work* chosen by 11.7% of the sample.

Four of the "patient care" options were about treatment and therapy choices, these clinical decisions would only be made by a small number of the respondents.

5.3 Discussion of the organisational goals results

The results showed consistency between the collective organisational objectives written in the annual plan, and those expressed by individual managers. The organisational objectives could therefore be taken as a legitimate value framework, one that other managers would recognise.

Clear themes were excellence in patient care, the need to be cost effective, the importance of the staff, and the need to attain Foundation Trust status. Staff

training and development emerged more strongly as a theme from individual managers than from the annual plan.

These themes echo the balanced score card principles used in some NHS performance monitoring (Kaplan, 1993). The four principles being: customer focus (patients) learning and growth (developing the workforce), internal processes (working efficiently and effectively) and financial. The balanced scorecard might be a productive approach to developing library performance indicators which can be related to an existing, relevant organisational value framework.

Identifying the frequency with which themes appeared was interesting but this was only one document and may give an unrepresentative picture.

One new result was that managers clearly recognised the complexity of measuring the impact of the library, and expected to see a range of measures not just cost effectiveness measures.

The responses indicated that these managers were looking for impacts on decision making and changes in practice and would accept user-perceived impacts.

The taxonomy served a dual purpose. It had been used to identify the organisational themes, and as a tool for presenting the results. There were no obvious themes in the document and interview data that did not readily fit the taxonomy, which indicated that it was a possible tool.

5.4 Conclusion to the Discussion

A clear picture emerged of how information was being used by the individuals in the study. It was also possible to interpret, or put a context to that use by using

the data about location, roles, sources, information needs and searching behaviour.

Information use in East Sussex hospitals NHS Trust was consistent with that identified in previous research.

The organisational values, set out as objectives, were identified from the annual plan and validated by the interview data.

The results showed that the uses made of information were directly related to organisational objectives and this could be demonstrated in a summary table. New evidence emerged about the type of library service measures that NHS managers might expect.

6. Chapter 6. Conclusions, recommendations and review of the research process

6.1 Introduction to chapter six

This chapter identifies whether the objective of the research was met, the research questions answered, and the hypothesis proved or disproved. The implications and recommendations for this library and wider library services are proposed.
The chapter also reviews the methodology, and makes recommendations for the questionnaire. The limitations of the study are identified and the practical process considered.

6.2 The hypothesis

The hypothesis was that *information obtained through the library service is used in ways that directly relate to organisational objectives*. The hypothesis was proved.

6.3 The first research question: "what use is made of the information provided by the library service?"

The data from the questionnaire and information-use interviews answered this question successfully but not fully. A clear picture emerged of the uses made of information. Strong links to the library service, library staff and resources were made, through the sampling method (from a population of library users), the qualitative data and the questionnaire which asked directly about information sources and library services. It cannot be claimed, however, that all the information used was provided by the local library service. In some cases (e.g. the provision of databases and links to full text articles) the involvement of library services may not be evident to the end-user.

The data provided additional validation of both the questionnaire and the interview schedule, and many of the results could be generalised to the study population.

6.4 The second research question: "How may organisational objectives be translated to the mission of the library service?"

The study identified one way this could be done, by using a taxonomy for content analysis. The resulting table (Table 11) offered a "translation" of local organisational objectives, goals and aims to standardised organisational concepts. These concepts had been developed with the mission of library services in mind, therefore the self-perceived impacts of library use could be mapped against them.

6.5. Does the information use relate to organisational objectives?

This question was answered. The information uses identified by the study related directly to organisational goals.

6.6 Conclusions from the research methodology

The chosen research methodology was appropriate for the study. It achieved the overall aim of the research, answered the research questions and provided data that could be used for service development.

The results provided additional validation of the questionnaire and interview schedule.

The evidence from the study indicated that information is used in more than one way, and the use or impact may vary over time. This adds support to the concept of *information-as-knowledge*, with impact dependent on the individual information user. The implication being that *information-as-knowledge* is the most appropriate definition for information *use r*esearch.

6.6.1 Limitations of the study and suggested improvements

An improvement to the study might be to link the library service more directly to the information use. The questionnaire and interview schedule could be adapted to refer specifically to information made available through library services. It would be difficult however to identify purely local library resources. Some internet- based resources are provided through the local service, others through NHS-wide provision.

It might be possible to follow-up on articles supplied by the library and focus the questionnaire around a particular article request. This research design would use a self-selecting sample and results could not be generalised to the library population. To relate information use to organisational objectives it was helpful to have prevalence data. When claiming that information was used for direct patient care it was important to demonstrate the level of that use in the organisation. Some of the data from the questionnaire could only be interpreted with reference to the qualitative data and so the collection of qualitative data is very important in information use studies.

More interviews would have resulted in a better understanding of how information was being used, and provided more evidence to inform the development of library services (although this was not the primary purpose of the study).

The organisational-goals interview schedule could be improved, as the first question was too general for managers with a broad remit. This would require further studies into translating objectives to library missions.

Content analysis of more than one key organisational document, and an additional coder to check the consistency of the coding, would improve the internal validity of the study.

6.7 Reflection on the dissertation process

A clearer understanding of interview theory and the adoption of a consistent approach could have improved the information use interviews. The first two interviews were short (10 minutes) while the last one took about an hour. The first two interviews did not deviate from the interview schedule, and the researcher took a passive role (to avoid leading the interviewee). The interviewer did not encourage the interviewee to expand on the answers and kept prompts to a minimum. This has been described as the *rational* approach, where an objective truth is available to be extracted and remain true in another context (Fontana, 2005 p. 717). The longer interview was more like a friendly discussion, which fits the approach of *interview-as-social- encounter*. This would also have been consistent with the constructionist approach.

In the practical process there were technical problems. On one occasion the microphone was not switched on, on another the tape twisted. It also became apparent that transcribing entire interviews would be not practical. Additional resources (mainly staff) would have made the process easier, but reduced the learning for the researcher.

The questionnaire had been validated and so did not require testing before it was sent to participants. It would however have been useful to test the data entry process before coding and dispatching the questionnaires. With improved coding the data entry may have been easier.

The dissertation process, for various reasons, took quite a while. This was useful in some ways as it allowed time for reflection. It was also a surprisingly iterative process. The practical experience of interviewing, data entry and content analysis really made sense of the theory. The learning moved from level 2 *personal learning* to levels 3 and 4 *applied learning* and *long-term impact* (Rogers, 2001)*.

6.8 Recommendations

6.8.1 Recommendations from the practical process
Reflecting on the dissertation process identified some practical considerations. The recommendation to practice tape recording is familiar but worth emphasising again:

- Use sample data to test the data entry process before coding questionnaires
- Fully practice using taping equipment for interviews
- Be clear about the type of interview approach to use, and that it fits the theoretical basis of the research.

6.8.2 Recommendations for the questionnaire
The questionnaire had already been amended after feedback from the initial research (Urquhart, Spink, Thomas, & Weightman, 2007). Although it was further validated by this study additional changes may need consideration. Several respondents had deleted and corrected their answers to question 7 and more clarity between information types, use and qualities may help avoid confusion, or misleading interpretations of the data. However it may not be possible to balance question clarity and the need to keep the questionnaire short to improve response rates.

- Review question 4 as it mixes media type and the intended use of the information
- Review question 7 as it mixes information qualities with information use
- Make a distinction between professional development (CPD) and personal development.

6.8.3 Recommendations for the library service

The discussion of results identified several issues which the library service could start to explore or tackle immediately. The recommendations are included in Appendix 6A.

6.8.4 Implications and recommendations for other library services

There were indications from the study that NHS managers would expect to see a range of evidence as measures of library value, including qualitative and quantitative data and would not just expect cost- benefit analyses, or other directly money-valued measures.

The research adds to the evidence that the *impact* of the information provided is an important measure. Library services should build on existing research to form a body of evidence about the impact of health libraries.

Findings from the organisational-goals interviews indicated that self-perceived value statements are just as acceptable as objectively measured value indicators, and are appropriate to demonstrate impact in library services.

The study found that the validated taxonomy could be used for content analysis, successfully identifying the organisational objectives which could then be related to the library mission. This is a possible model for identifying and presenting evidence about the impact of libraries.

Other libraries, with similar populations, could use the generalisable results as evidence of the value of local NHS libraries to their organisations.

Findings add to the picture of information use in health libraries, with results confirming that information is used to support direct patient care and personal development. Information is also used in ways that support other organisational goals including service development, financial goals and risk reduction.

6.9 What this adds to the existing literature and research

This research study adds evidence to the picture of information use in the healthcare environment. The respondents' results were comparable with the results from previous research undertaken in developing the toolkit (Urquhart, Spink, Thomas & Weightman, 2007); results about information needs, impact and future use were within 10%+-.

Results from this study suggest that ranking is not particularly useful, as it will depend on response rates and the makeup of the sample. A difference balance of roles in the sample will change the ranking, for example more doctors (or those who make diagnostic or treatment decisions) in the sample may change the ranking for the type of information required, or information impact. Some results from this study can be used by library services with similar populations.

6.9.1 Recommendations for future research

Further robust and replicable impact studies are needed to demonstrate the value of health libraries in the NHS.

To demonstrate the library value, this study used a framework for presenting library impact (by way of information use) in organisational terms. It would be interesting to explore this approach further, particularly the potential of the balanced scorecard.

Further studies are required into NHS organisational values, and the ways in which the library mission can be expressed to fit that value context.

Findings add to existing literature, identifying the need for a range of library measures (Poll & Payne, 2006 ; Markless & Streatfield, 2006). Measures need to

be selected appropriately to meet the various internal and external requirements, to show value, monitor and develop services.

The literature suggests that information behaviour is not fully understood and so further exploration is required. This study found a complex picture of individual information needs and use, varying over time and situation, which supports the constructivist, realist approach for future research.

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Literature search strategy   **Appendix 2A**

Medline was selected for the initial literature search, on the general theme of value in health library services. Medline was chosen because it indexes the healthcare library journals most likely to publish relevant articles. A mix of medical subject headings (MeSH) and text words was used. Medline is primarily a healthcare database so, unlike LISA, the thesaurus does not include detailed subject headings for library and information studies research. The specific subject coverage of Medline also means that broad library subject headings can be used effectively. MeSH "Library Science" OR "Libraries" were selected, which covered a number of synonyms. The terms were exploded but not limited in any way. This very broad search retrieved a set of 458522.

Text words were added to retrieve the most relevant articles from this set: "impact" OR "value" appearing only in the title field. This was judged a very specific search strategy, as the most relevant articles would probably use at least one of those words in the title. It was recognised that the search was not sensitive, as synonyms were not used, and relevant articles would be missed. It was decided that recent, relevant articles would cite key articles that the search missed.

The search retrieved 95 documents, of which only 14 were considered most relevant. The text word "impact" retrieved numerous irrelevant papers about journal impact studies. To avoid language bias, the search was not limited to English, and as titles appear in translation in Medline, the English text words would not have excluded foreign language papers.

Search History:

1. MEDLINE; exp LIBRARIES/ OR exp LIBRARY SCIENCE/; 458,522 results.

2. MEDLINE; (value OR impact).ti; 141974 results.

3. MEDLINE; 1 AND 2; 95 results.

The search retrieved a recent systematic review (Weightman & Williamson, 2005). The review looked at the impact of information provided through library services on patient care. Although this was a narrower focus than the current research study, it was deemed highly relevant because the prime purpose of an NHS organisation is patient care. This review used a sensitive search strategy across a range of databases and the internet, identifying key research papers in the relevant subject area, proving to be a very useful resource.

Twenty eight studies met the inclusion criteria of the retrieved review and were critically appraised by the review authors. The conclusions from the systematic review were used in the toolkit (Urquhart & Weightman, 2008) which guided the methodology for this research study.

The systematic review used a sensitive search run across ERIC, LISA, Medline, Premedline, EMBASE, and the Cochrane Controlled Trials Register, covering both library and information science and healthcare. Google was used to search the internet. The search did not use subject headings or thesaurus terms, which would be database specific, but used truncated search terms covering every variation or synonym for value in a health library.

The search terms, databases, Google search, hand searching and specific requests for information indicated a robust and comprehensive literature search. This view is supported by the inclusion of a structured abstract by the Cochrane Library in the Database of Abstracts of Reviews Issue 2 2009 (DARE) having met a clear set of quality criteria.

Although the initial search for this study was not sensitive and missed at least one recent important paper (Banks et al., 2007), it retrieved a pertinent systematic review (Weightman & Williamson, 2005) and other key research studies. These were the Fuld Campus study (Cuddy, 2005) and the Rochester study (Marshall, 1992). Other relevant papers, including the Chicago study (King, 1987) and the EVINCE study (Urquhart & Davies, 1997) were identified from the references of the first fourteen articles. (Appendix 2C)

A further search was run after the study had taken place to identify articles published since 2003. This search attempted to replicate the sensitive search strategy used in the Weightman review (Weightman & Williamson, 2005), and used their search terms in Embase and Medline, limited to items with a publication date since 2003 (the latest date from the original review).

1. MEDLINE; (((Performance ADJ indicator* OR performance ADJ measure* OR performance ADJ standard* OR impact OR value) AND (Health* ADJ librar* OR medical ADJ librar* OR postgraduate ADJ centre ADJ librar* OR hospital ADJ librar* OR nursing ADJ librar* OR information ADJ service* OR virtual ADJ librar* OR electronic ADJ librar* OR electronic ADJ information))).ti,ab [Limit to: Publication Year 2003-2009]; 130 results in Medline, 103 in Embase. Four relevant articles, no new evidence.

This search retrieved a large number of irrelevant articles, of which four were relevant (Weightman, Urquhart, Spink, & Thomas, 2009; Medernach & Franco, 2007; Marshall, 2007; Cullen, & Essen, 2007) but no information was identified that would have altered this study.

The review search terms were too broad for searching LISA, the library and information database, so the search was for the text words "value OR impact OR contribution" in the title field only. This retrieved one further article (He, Chaudhuri & Juterbock, 2009), which added to the evidence that outcome evaluation, rather than traditional output measures were needed to show the value of the library service.

LISA Search Query: TI=(value or impact or contribution) retrieved 224 articles

TI=(value or impact or contribution) and not
TI=(journal or journals) and DE=(medical or health) retrieved 10
One additional article

APPENDIX 2B

reference	Outline, background purpose,	Study design,approach,	comments
Austin,sister The impact of hospital libraries on paramedical personnel. Hosp Prog 1959 sep 40 64-5			Not obtained- v.short so unlikely to be a detailed study, focus on paramedical, may be too old.
Burton JE The impact of medical libraries and literature on patient care in New Zealand. Bull Med Lib Assoc 1995 Oct 83(4):425-30	Study to determine if physicians used the library and what impact it had on patient care	Survey- questionnaire of 372 physicians 80.6% response Patient care main reason Keeping up to date second Impact – change or confirm decisions on diagnosis, medicines, tests, avoiding admission.	Identifies areas of impact in patient care Idea of changing behaviour as an impact
Cairo A The impact of the medical library on medical education. Hosp prog 1958 Jun 39(6) 72-3			Not obtained – v. short and may be too old
Cuddy, T. Value of hospital libraries: the Fuld Campus study. J Med Libr Assoc 93(4) 2005. 446-449	2001 –2003, 214 lit searches and ILL requests followed up asking how the information was used. Response rate of 26% (56) with Responses coded to an existing taxonomy	Survey - questionnaire Critical incident technique Not sure how sample chosen, possible bias in sampling. No detail on stats 91 unique examples from the 56 patrons 32% patient care	Used headed paper to make requests formal to improve response. Results are about how the information was used- the value aspect from organisational context – idea of Abel's taxonomy to present library value in organisation

			terms
Hardy,M.C. Evaluating the impact of library services on the quality and cost of medical care. Bull. Med. Libr.Assoc. 73(1) 1985 43-46	Traces the events leading to minimizing of hospital library role (America) and discusses"the complex problem of evaluating the impact of library services"	Review of current position	In America in 1982 a new reimbursement system was introduced – fixed price regardless of the actual cost to the hospital. In 1984 it was announced that library costs were included in the fixed prices Refers to effectiveness, cost-effectiveness, cost-benefit evaluation. Identifies 5 categories of impact studies
Jones HW. The value of special collections in medical libraries Bull Med Libr Assoc 1941 30(1) 40-55			Outside the scope of the study
Marshall, J. The impact of the hospital library on clinical decision making:the Rochester study. Bull Med Libr Assoc 80(2) 1992	"explored the impact of library services on clinical decision making" p169	Based on King (Chicago Study) refined including importance of upping the response rate (letters,follow up) Homogenous population-physicians from 15 hospitals in the Rochester group. Sample of 448 Systematic sample with random start. Sampling continued if a randomly selected physician refused.	V important study Possible bias eg in the sample recognised by the researchers Used 7 point scale on the importance of the decision change on the patient 2 follow ups

		208 returns	
O,Connor P Determining the impact of health library services on patient care: a review of the literature Health Info Libr J. 2002 Mar;19(1):1-13	Reviews method and outcomes of impact studies in four countries since 1980s	Review of the literature	Useful overview of techniques
Saracevic, T. and P. Kantor. Studying the value of library and information services. Part 1: establishing a theoretical framework. Journal of the American Society for Information Science. 48(6):527-542 1997	Part 1 explores the meaning of value in library services. From this a taxonomy was developed to help in value studies Looks at philosophical and economical concepts of value "they consider that value is related to, but not synonymous with "good" "desirable" or "worthwhile" and can be positive or negative. intrinsic value eg health extrinsic/instrumental eg exercise for health inherent - art contributory – used with other things for good info services may have value in all these ways	Establishing the theoretical framework.	Important distinctions between value-in-use and value-in-exchange
Saracevic, T. and P. Kantor. Studying the value of library and information services. Part			Taxonomy may be useful in looking at the questionnaire

2. Methodology and taxonomy. Journal of the American Society for Information Science. 48(6):543-563 1997			
Tao D. Transition from in library use of resources to outside library use; the impact of the internet …. AMIA Annual Symp Proc 2003:1027			Outside the scope
Urquhart, C. and J. Hepworth. The value of information supplied to clinicians by health libraries: devising an outcomes-based assessment of the contribution of libraries to clinical decision making" Health Libraries Review 12(1995):201-213			Key study
Todd-Smith B the value of hospital library benchmarking: an overview and annotated references Med Ref Serv Q. 2002 Fall 21(3) 85-95	review	Review of the literature	Outside the scope
Van Moorsel G Client value models provide a framework for rational library planning..Med Ref Serv Q 2005 24(2) 25-40	Theoretical and practical article about using clients values to guide services and purchases		Idea of using the clients value framework.
Weightman, A. L. and J Williamson etc. The value and impact of information provided	"An updated systematic review was carried out of research studies looking at the value	Systematic review	Very important article Focuses on patient care but (as this is the main organisational goal

through library services for patient care: a systematic review. Health Information and Libraries Journal 2005 (22) 4-25	and impact of library services on health outcomes for patients and time saved by health professionals" inclusion criteria of at least 1 time-saved or health outcome studies were generally poor or small. " proposals for the measurement of the organisational goal of providing excellent clinical care were indirect measures such as "support informed and timely decision making" and support the development of policies and procedures relating to clinical care" p5 " Measuring a direct impact on patient care is therefore difficult, but tangible evidence of benefit is needed to justify continued expansion and investment in health-care libraries" p 5 "given the difficulties in collecting hard data on patient outcomes it is recommended that questions covering the effect of information on other important outcomes should be		for NHS libraries) retrieves and analyses all the most important research up to 2003 Forms the basis of recommendations for a toolkit for value.

	developed with the input of library users. These could include the effect on professional development, influence on key decision makers and/or in the preparation of local guidelines and savings to the organisation including staff time" p22		