QUALITY ISSUES OF SWEDISH GATEWAY SERVICES

A study based on eleven gateway services of the national resource libraries in Sweden

Darlene Adam
Andrea Bjurström

Abstract

Denna magisteruppsats diskuterar kvalitetsfrågor med utgångspunkt i elva svenska portaltjänster. En portaltjänst är en webbtjänst vilken samlar och länkar till fritt tillgängliga webbresurser inom en viss ämneskategori. Tjänsten erbjuder även någon form av kvalitetskontroll av de webbresurser som ingår. Författarna tittar även på definitioner av termen portaltjänst.

Syftet med uppsatsen är att diskutera några frågor som är viktiga att lösa för att kvalitén i de svenska portaltjänsterna ska kunna förbättras. Författarna diskuterar framförallt begreppet resurskvalité och tillämpningen av resurskvalité i de svenska tjänsterna samt i några utländska tjänster. De svenska tjänsternas mål och syfte diskuteras också. Portaltjänsternas resurskvalitet jämförs med de tjänster vilka också har till syfte att tillhandahålla kvalitativa resurser till användare inom den akademiska sfären, nämligen publiceringstjänster och vetenskapliga tidskrifter.

Uppsatsen visar att de svenska portaltjänsternas resurskvalité varierar mycket. Slutsatsen är att det vore önskvärt om tjänsterna samordnade sig runt en gemensam policy när det gäller urvalskriterier av resurser, gärna efter utländsk modell. Författarna poängterar vikten av att offentligt, dvs. via hemsidan, delge användarna information om tjänstens mål, policy och urvalskriterier.

As you know, students and researchers are no longer interested in only their local university campus information system. Their interest and activity area extends to other universities and research centres and so, the academic information systems should follow suit and offer global information services.[1]

<hr />

[1] Titia van der Werf in TALKING HEADS 1, April 2000.

Index

1. Introduction and background

Anyone who ever uses the Internet will quickly face the need to find *relevant* information of high quality. This basic need is met in the commercial sector by popular services such as Google or Altavista, to name but a few. Unfortunately, these search services have certain fundamental drawbacks when it comes to finding useful information. The drawbacks are that websites can pay these commercial gateways to obtain higher ranking than non-paying websites within the service and further, that most of these gateways take no responsibility for the quality of the websites they provide links to. Clearly these problems make it difficult for the users to find quality information on the Internet using these popular resources.

Recently however a new kind of service was introduced which could potentially address the ever-important need for relevant, high quality information on the Internet. Non-commercial public institutions such as academia and government bodies around the world began to provide gateway services to promote discovery of qualitative Internet resources. The terms currently used by information scientists for these various and uncoordinated global gateway services are *quality-controlled subject gateways* (QCSG) and *subject gateways*. It should be mentioned that the implementation of these internationally adopted terms is extremely important for the progress of work with the gateway services. This is because there has been some confusion in the past concerning the definition and context of these terms. In fact in Sweden, some confusion over the various types of gateway services still remains in the organisation of the eleven Swedish gateway services produced by the national resource libraries.

Amongst the global efforts concerning subject gateways and QCSGs, we are particularly interested in the developments currently taking place in Sweden. Besides the interest naturally stemming from our contacts with this community, the reasons for looking at the Swedish efforts is that they are in a critical stage. This is for instance exemplified by the current discussion amongst some information scientists about the purpose of the Swedish gateway services. That the gateway services are currently in a critical stage was also emphasised by BIBSAM (Swedish royal library's department for the co-ordination and development of national libraries) when they recently stated that there is a need for co-ordination between Swedish gateway services. We therefore believe that an investigation of these services is appropriate at this time.

2. Purpose, method and limits

2.1. Purpose
The purpose of this master's thesis is to discuss some quality issues that are important to resolve in order to improve the quality of the existing Swedish gateway services.

   We address issues concerning the present and future situation of these services. For the sake of argument one could ask if these Swedish services are necessary at all. Is it reasonable to spend money on these services when they in part duplicate the efforts and services provided already elsewhere in the world? Could it be that in the global context of the Internet, Sweden is better off focusing on online resources relevant to Sweden? Are gateway services that are unable to guarantee high resource quality of any use to the academic community? Is it possible to secure high quality resources in a gateway service, and if so how?

Throughout our study, we will address the following questions:
1. What is a gateway service?

2. What is meant by "quality control" and how is it practised and implemented in different gateway services?

3. How is the selection of resources carried out?

4. How are gateway services assessed by the users?

5. In relation to international services, how should the Swedish gateway services deal with *resource quality* issues?

2.2. Method
In order to answer the questions above we obtained information by a comprehensive literature study and through an evaluation of eleven Swedish gateway services managed by the national resource libraries in Sweden. We also attended the *Renardus workshop for potential participants* between the 15th and 16th of November 2001.

   The literature study gave us a comprehensive view of gateway services. The evaluation of the Swedish gateway services provided information about the individual gateway services that we could not otherwise gain through the literature study. It also gave us an understanding of who manages and develops the services.

   The Renardus workshop provided important information about the European gateway services and international collaboration efforts.

2.3. Outline
The present thesis is organised in the following way: first we provide the purpose, aim, and the methods used. This is followed by a literature study with a survey of recent literature concerning gateway services. This literature study presents the concept of gateway services, the general functionality of gateway services, quality within a gateway service, the role of producers with respect to some academic

gateway services, and the national and international perspectives of gateway services.

The literature study is followed by a presentation of the Swedish gateway services based on data gathered by the present authors. The arguments in the literature study together with the results of the survey are further expanded in the discussion chapter. Our focus in that chapter is on how to improve the present situation of Swedish gateway services and especially issues concerning resource quality. We conclude with a summary which recapitulates the present work.

2. 4. Limits

It is not within the limits of this thesis to conduct a full evaluation of the Swedish gateway services but instead to present a more general discussion concerning questions that have evolved throughout our work process.

Gateway services use standard information technology techniques. Because of this we will not investigate any technical aspects of gateway services in this thesis. Neither is it our purpose to discuss questions about user interfaces or user friendliness for the same reason. We have also decided not to carry out a user-based evaluation.

Also, we do not discuss quality issues in the library community in general. For those interested in such questions and how they are debated in Denmark and Sweden, we suggest the paper *Fitness for purpose* by Tomas Friberg and Henrik Åslund, a study that compares two different ways of developing quality issues within the library sphere.

3. Literature study

The aim with this literature study is to show how issues such as quality selection criteria concerning online resources in gateway services and quality control in gateway services are debated in the literature. The literature study also brings up the question of how to define a gateway service. The European DESIRE project is presented as an example of international collaboration that deals with quality issues such as selection criteria.

Furthermore a presentation of the roles of the responsible parties, owners or producers of gateway services is provided, first on a national level, i.e. the role of BIBSAM, the Royal Library and the Swedish national resource libraries. Then we look into a number of international gateway services, their structure, functionality and the role of the producers. The European Renardus broker service initiative is also presented.

The literature chapter ends with a small survey of user surveys that presents the user opinion concerning gateway services in general.

3.1. Definitions of different gateway services

There are many different terms used in the literature that describe or refer to the same type of subject gateway.[2] The terms that are frequently used and applied by a growing number of specialists within the field of information science are those that were defined by Traugott Koch.[3] Terms like portals, gateways, subject gateways, information gateways, hubs, etc. are according to Traugott Koch used to describe related types of services.[4] We decided to apply his definitions of the terms on a basis, as we believe them to be generally established within the major parts of the international information science community.[5]

Traugott Koch defines two major types of services: subject gateway and quality-controlled subject gateway (QCSG). We decided to apply the collective term *gateway services* when we refer to these two types of services. Where other terms are used in the literature for the same services, the terms (with exception for in quotes) have been changed to his terms.

One example of an acronym for a subject gateway that is often applied within the information science community is SBIG, which stands for subject-based information gateway. Koch defines SBIG as synonymous to a subject gateway.[6]

---

[2] As an example of that discrepancy see Hoffman Paul, Worsfold Emma, Specification for resource description methods Part 2: Selection criteria for quality controlled subject gateways, *DESIRE – Development of a European service for information on research and education*, 1996, p 5. They use four different terms when referring to one type of gateway service: subject gateway, quality-controlled information catalogue, quality-controlled information gateway and information service. Accessible via http://www.ukoln.ac.uk/metadata/desire/quality/quality.rtf [Last checked 28/1-2003]
[3] Traugott Koch is an information specialist, active for many years in information science research projects within Europe and currently based in Sweden and Denmark.
[4] Koch Traugott, Quality-controlled subject gateways: definitions, typologies, empirical overview, *Online Information Review*, 24 (1), 2000, p 26.
[5] The Koch definitions are applied in several countries in Europe but also in countries like Australia.
[6] According to the author the term originates from the DESIRE project. Koch Traugott, 2000, p 26. The DESIRE uses the two terms synonymously when they talk about that service, see also footnote three.

The Traugott Koch definition of QCSG is that they are:

> internet services which apply a rich set of quality measures to support systematic resource discovery. Considerable manual effort is used to secure a selection of resources which meet quality criteria and to display a rich description of these resources with standards-based metadata. Regular checking and updating ensure good collection management. A main goal is to provide a high quality of subject access through indexing resources using controlled vocabularies and by offering a deep classification structure for advanced searching and browsing.[7]

QCSGs are services that apply very high standards for securing qualitative online resources and provide a full and detailed resource description. With "considerable manual effort" Koch means that an editorial staff, that constitutes of information specialists and/or subject specialists, does the manual selection of resources and the rest of the elements mentioned below.

Traugott Koch defines the elements of QCSGs as follows:

> (1) *Creation*: considerable manual creation or intervention efforts will be applied. These are carried out by editors and information and /or subject specialists, to ensure quality levels and coherence of the service. This is especially important for the selection and content description of the resources.

> (2) *Collection development*: a policy based on published selection criteria focusing on the quality of the resources to be included would be beneficial. This selection is normally an intellectual process. A quality gateway will strive for "completeness" and balance (for example, by topic, by geographical representation, by document type) based on this policy.

> (3) *Collection management*: a policy for maintenance of the collection should guarantee currency through record checking for content changes, regular updates to the collection, link checking, weeding.

> (4) *Resource description/metadata*: quality indicators are:
> • a rich set of quality metadata for the individual resources;
> • the display of a large part of these metadata;
> • compliance to a metadata standard;
> • a formalized, coherent level and style of the content description (annotation, summary, abstract, review).

> (5) *Subject access*: the use of deeper levels of classification for the subject/browsing structure of the service is one of the most important criteria for a quality subject gateway; criteria are also the use of keywords or better controlled vocabularies (e.g. subject heading systems, thesauri) for subject indexing of the resources and a more or less advanced and integrated search and browse access.

> (6) *Standards*: the application of open standards to allow

---

[7] Koch Traugott, 2000, p 24.

interoperability with other services indicates a quality gateway.

(7) *Value-adding features* (e.g. regarding display and usage features): contribute to the quality, too.[8]

Traugott Koch defines subject gateways as:

Internet services which support systematic resource discovery. They provide links to resources (documents, objects, sites or services), predominantly accessible via the Internet. The service is based on resource description. Browsing access to the resources via a subject structure is an important feature.[9]

Subject gateways apply limited quality control and description.
According to Traugott Koch's definitions, the subject gateways can include a minimal resource description (i.e. document surrogates), but this is not an important feature.
   Resource descriptions in subject gateways are not as detailed as resource descriptions in QCSGs but both services can have an editorial staff.
   Subject gateways can acquire resources by automated harvesting, where as many resources as possible are gathered at the expense of resource quality, but they also apply some sort of manually selection according to selection criteria.

The subject gateways also include a service called *link list*. Link lists as well as subject gateways provide access to online information resources, but resources in link lists are not as quality controlled as in subject gateways. Link lists also use less technology and metadata in general. Finally, resources in link lists are often organised in a simple list of hyperlinks - hence the term link list.
   According to Traugott Koch, link list can include a minimal resource description that places them in the subject gateway category. But elements like collection development, collection management, subject access and value-adding features are usually incomplete or non-existent in link lists.[10]

3.2. Quality selection criteria in gateway services

Quality is a very complex concept and what one person considers quality is not necessarily quality according to someone else. There are several different aspects of quality and quality can be applied to many products and processes. A universally agreed definition of what quality is does not exist. However common for all aspects is that quality cannot be defined just in relation to some abstract concept of "excellence", but should be seen in relation to the demands of the user of the final product.[11]
   In libraries were books and journals before the advent of electronic databases selected according to the libraries own selection criteria; criteria that would usually have some reference to the users needs and/or requirements of the host organisation. This general approach was later applied to other information formats like microfilms, videocassettes, CD-ROMs, etc.

---

[8] ibid.
[9] Koch Traugott, 2000, p 25.
[10] Koch Traugott, 2000, p 26.
[11] Hoffman Paul, Worsfold Emma, 1996, p 33.

Information quality first began to be a serious concern with the increasing use of electronic databases, both online and on CD-ROM and of course with the increasing use of Internet.[12]

Paul Hoffman and Emma Worsfold state that services such as "internet subject gateways have mostly defined 'quality' with relation to carefully chosen lists of selection criteria."[13] However, defining quality processes and criteria for gateway services involves more than simply listing the right questions to ask about potential resources.[14]

When selecting resources according to quality criteria such aspects are taken into consideration as who is the producer of the resource, the level of quality of the resource, the relevance of the resource in comparison to a special target group. In the literature we found some material discussing the question about quality selection criteria, presented below.

One project that dealt with the issue of selection criteria for academic gateway services was the DESIRE project. The DESIRE project ran from July 1998 until June 2000 as collaboration between partners from ten organisations from four European countries - the Netherlands, Norway, Sweden and the United Kingdom.[15] The DESIRE project aimed to support the development of new gateway services in Europe, especially large-scale national services by developing and promoting the gateway service model.[16] The DESIRE project also developed the DESIRE quality selection criteria list for gateway services. A list of selection criteria for guidelines and methods were compiled and the main objective was to provide:

> standards and procedures for resource selection by subject gateways
> methods (and tools) for the development of quality-controlled
> information catalogues quality mechanisms to permit the quality of
> information and information services to be monitored and reported
> a framework for quality assessment and control within subject
> gateways.[17]

To see the entire selection criteria list, see appendix 2.
The DESIRE standards, guidelines and tools are applied through out Europe, but they are also applied or further developed in Australia.[18]

The BIBSAM view on quality selection criteria is that *if* the Swedish gateway services would formulate shared quality selection criteria, it would be beneficial for the services, but the co-ordination would be optional and the initiative would primarily have to come from the national resource libraries, not from BIBSAM.[19] On

---

[12] Hoffman Paul, Worsfold Emma, 1996, p 38.

[13] Hoffman Paul, Worsfold Emma, 1996, p 34.

[14] Hoffman Paul, Worsfold Emma, 1996, p 6.

[15] Accessible via http://www.desire.org/ [Last checked 28/1-2003]

[16] Place Emma, *International collaboration on Internet subject gateways*, from the 65th IFLA Council and General Conference, Bangkok, Thailand August 20 – 28, 1999, accessible via http://www.ifla.org/IV/ifla65/papers/009-143e.htm [last checked 31/5-2003]

[17] Hoffman Paul, Worsfold Emma, 1996, p 4.

[18] The National Library of Australia refers to the Desire project in their documentation of the Australian gateway services, e.g. when it comes to description and definition of subject gateways, see National library of Australia, *Definitions for Web-based services*, accessible via http://www.nla.gov.au/initiatives/sg/servicestypes.html [Last checked 23/11-2002]

[19] Åslund Henrik and Friberg Tomas, *Samordning av ansvarsbibliotekens ämnesportaler. Grov teknisk kravspecifikation.* 13/5-2002, p.14. Accessible via http://www.kb.se/bibsam/utredn/amnesportaler.pdf [Last checked 2/2-2002]

the other side the same document states that a working group (who should be included is not specified) should look into the coordination of quality criteria.[20]

One of the major quality control issues is if the selection of online resources should be done manually, i.e. through human assessment or automatically, for example through harvesting robots. A focal point of the gateway system is the human interaction in the selection process. Gateway services carry out activities, such as providing access to selected qualitative resources, and these activities do not lend themselves for automated application. On the other side, it is important to further develop the automated resource harvesting process. So far systems have not been developed that could handle such detailed and definitive selection criteria since selecting online resources is a very complex and detailed process that is best carried out by subject specialists. [21]

   Traugott Koch's view on this matter is that it will probably be harder to reach high quality levels by applying only automated methods of metadata creation. He believes that some manual evaluation is necessary.[22]

3.3. The peer review system

Since gateway services are relatively new services in the academic community and they lack established quality control system we decided to look into an acknowledged quality control system of scientific journals, the so-called peer review system.

   Over the years, the academic community has followed certain guidelines in order to secure quality of printed resources. It is standard practice that a scientific writer follows the guidelines since he or she needs to attain scientific stringency. The peer review system is one form of quality control of a document and is applied especially in scientific journals. The core of the peer review system is that referees, i.e. subject specialists, review scientific material produced by other scientists, and by that secure or improve the quality of produced material and the scientific level of it.[23] It is generally agreed by members of the scientific community that:

> the characteristics of the primary, or original, publication are that (a)
> articles present research not previously published (…), (b) articles are
> reviewed by peers before being accepted or rejected by a journal. (---)
> To ensure the quality of each contribution – that the work is original,
> valid, and significant – authorities in the subspecialties of a field
> carefully review submitted manuscripts. The peer-reviewed journals in
> which the literature is preserved thus serve as "journals of record, that
> is, authoritative sources of information in their field".[24]

There is an ongoing debate concerning the high costs for publishing of scientific articles also due to the fact that several new and upcoming organisations have for the

---

[20] Åslund Henrik and Friberg Tomas, 2002, p 22.
[21] Hoffman Paul, Worsfold Emma, 1996, p 3.
[22] Koch Traugott, 2000, p 26.
[23] van Rooyen Susan, Black Nick and Godlee Fiona, Development of the Review Quality Instrument (RQI) for Assessing Peer Reviews of Manuscripts, *J Clin Epidemiol* 52 (7), 1999, p. 625.
[24] American psychological association, *Publication manual of the American psychological association*, 5 ed. 2001, Washington DC, p 347.

past years offered alternative ways of publishing articles. One of the major issues is if the peer review system contributes to the high publishing costs or not. The management and administration of scientific journals are expensive and it is difficult to disentangle the costs of the peer review system from the general administration of the journal.[25] Referees are generally unpaid and the conclusion by some is that the cost of peer reviewing is much lower than claimed by traditional publishers.[26]

Organisations as SPARC (Scolarly Publishing and academic Resource Coalition) and BioMed Central offer cost-effective access to peer reviewed articles.[27] The alternative ways of publishing articles offered by e.g. SPARC and BioMed Central indicate that the costs could be reduced on a general level. These organisations manage to offer peer reviewed articles to a much lower price than the traditional publishing companies, as for example Elsevier.[28]

BioMed Central is a publishing service that provides access to online resources that are free of charge to the users. The target group is the academic community.[29]

The peer review system is not perfect and effective enough to ensure total quality control, due to problems concerning subjectivity, bias, fraud or other misconduct. But it is the only viable and lasting alternative that has subject specialists judging scientific material.[30]

The sources quoted above discuss the peer review system from the viewpoint that it is applied only on printed or electronic articles, not as an application on online information resources. The question is can a peer review system be applied on online resources as well? Could the system secure quality of online resources?

The importance of finding the right methods for adequate quality control of online resources is evident. The Norwegian scientist Even Houvdhaugen believes that in the future, more and more prestige will be associated with quality-labelled knowledge. He calls for an extensive system for accreditation of Internet resources produced by universities and this system should be based on a comprehensive peer review system carried out by international subject specialists.[31]

3.4. National resource libraries in Sweden

The system of national resource libraries in Sweden comprises of eleven national resource libraries in different subject fields, which co-operate with other associated resource libraries. The system is administered by BIBSAM (the Royal library's department for national co-ordination and development).[32] The eleven different gateway services are produced and developed by the national resource libraries. Each service provides access to resources in one or several subject areas e.g. biology,

---

[25] Rowland Fytton, The peer review process, *Learned Publishing*, 15, 2002, p. 252, 256.

[26] Rowland Fytton, 2002, p.252.

[27] Accessible via http://www.arl.org/sparc/core/index.asp?page=a0 [Last checked 24/5 2003], and http://www.biomedcentral.com/info/ [Last checked 24/5 2003]

[28] Karin Ericsson Lagerås, Vetenskaplig publicering i gungning, 2003, p. 25.

[29] For more information go to http://www.biomedcentral.com/ [Last checked 24/5 2003]

[30] Harnad Stephen, The invisible hand of peer review. *Exploit interactive*, 5, 1999, accessible via http://www.exploit-lib.org/issue5/peer-review/ [Last checked 25/5 2003]

[31] Hovdhaugen Even, Informasjonskompetanse for studenter – hvorfor og hvordan, *Synopsis*, 6, 2000, p. 339.

[32] Åslund Henrik, Friberg Tomas, 2003, p.3.

medicine or technical sciences.[33]

For the last couple of years a preferred task of the national resource libraries has been to build and develop gateway services.[34] The services have expanded during the last couple of years and are constantly evolving in content and design. One of them, the EELS gateway, was recently shut down.[35] The service was the oldest of the Swedish gateway services and one of two Swedish services that used to participate in the European Renardus broker initiative, the other one still participating is NOVAGate.[36] The Renardus initiative is presented later in this chapter.

The national resource libraries finance most of the costs for the gateway services and BIBSAM is only partly responsible for the funding. Yet between 1997-2001 BIBSAM invested approximately eight million SEK in the gateway service projects, the same amount as the total annual grant from BIBSAM to the national recourse libraries' other projects.[37]

The gateway services are still under construction and the costs for developing them might drop when all of the gateway services are evolved and run steadily. On the other hand it is doubtful whether it is possible, since past experiences show that the longest running services still require costly technical maintenance. For instance, for the past two years the further development of the gateway service EELS cost 860 000 SEK.[38] It might be difficult to motivate further financing of the different technical development of the gateway services since this development leads to continuous high costs. There is also the risk that the gateway services might evolve on the expense of the national resource library system.[39]
In spring 2002 BIBSAM presented a proposal for a joint database for all of the Swedish gateway services.[40] The proposal suggests mainly technical solutions.

3.5. International gateway services

This section presents different gateway service initiatives that have taken place in several countries, such as Australia, Denmark, Norway, United Kingdom and the United States. Australia and United Kingdom are those countries that we find have come a long way with the process of developing gateway services. Denmark and Norway are included in the presentation since they, like Sweden, are Nordic countries and are interesting in comparison with Sweden. We find that the different gateway service initiatives and adjacent projects in the United States are also worth looking into. The OCLC consortium in Dublin, Ohio, is an organisation that is responsible for many different projects and we want to look into how OCLC has influenced the creation and management of gateway services primarily in the United States.
This presentation is a brief and general one, where we look into three items:

---

[33] For more information about the different subject fields see the web page of the Royal library, accessible via http://www.kb.se/BIBSAM/english/nrl/libraries.htm
[34] Klondiras Inger, *Kvalitetsbedömda informationsresurser på Internet/WWW.* Accessible via http://www.kb.se/bibsam/ansvbibl/gateways.htm [Last checked 1/2 2003]
[35] EELS was shut down January 2003. It is still possible to use the service but the existing version of the service has been frozen.
[36] EELS, accessible via http://eels.lub.lu.se/ , NOVAGate, accessible via http://novagate.nova-university.org/nova.html [Last checked 22/12-2003]
[37] Åslund Henrik, Friberg Tomas, 2002, p.5.
[38] ibid.
[39] ibid.
[40] Åslund Henrik, Friberg Tomas, 2002, p.23.

1. who is responsible for the funding and management of the gateway services
2. purposes, criteria, target groups, metadata and some standards and guidelines that are stated, defined and implemented
3. presentation of some of the gateway services (by type or subject, the longevity of the services and whether they are still ongoing)

Many of the different sources use the term subject gateway when they talk about services that by our definition fall under the category gateway services.

3.5.1. The Australian gateway services

The Australian gateway service initiative started back in 1999 and is constantly evolving. The Australian government supports this initiative, both with financial backup and overall support. Each owner funds their own gateway service and the service also receives grants from the Australian Research Council. A joint forum called the Australian Subject Gateways Forum co-operates closely with the National Library of Australia in Canberra. The Australian gateway services are owned, developed and managed by several Australian Universities. There are approximately 18 established gateway services at the present and a couple more are under construction.[41]

The fundamental purposes of the Australian gateway services are, according to information specialist Roxanne Missingham, to:

º provide for convenient and effective access to information resources (most often Internet resources) through a single gateway.
º describe resources according to agreed-upon standards after selection for quality and subject content.
º identify information resources to agreed-upon content guidelines (most often subject areas, such as agriculture of chemistry).[42]

The focus of the gateway services is on Australian oriented or Australian produced resources.[43] The Australian Subject Gateways Forum defines a subject gateway as "a Web-based mechanism for accessing a collection of high quality, evaluated resources identified to support research in a particular discipline". They refer further to subject gateway definitions by IMesh Toolkit project (see the section about Great Britain) and the DESIRE project, and when defining the characteristics of subject gateways, such as resource selection, collection management, resource description and subject classification, they refer to here earlier mentioned Traugott Koch definitions.[44]

The Dublin Core metadata standard[45] and a cross-gateway-searching standard Z39.50 is apparently used by all gateway services, as well as thesauri. In some of the

---

[41] For more information about the Australian Subject Gateway Initiatives, see the following link: http://www.nla.gov.au/initiatives/sg [Last checked 23/11-2002]

[42] Missingham Roxanne, Portals down under, *Econtent*, 23(2) 2000, p. 40-47.

[43] *Best practice checklist for Australian subject gateways*, accessible via http://www.nla.gov.au/initiatives/bestpractice.html [Last checked 30/5 -2003]

[44] *Definitions for Web-based services, a set of working definitions for Web-based services linking to high quality, reviewed resources for researchers and other interested parties*, as endorsed by the Australian Subject Gateway Forum at the ASGF meeting on 23rd February 2001, accessible via http://www.nla.gov.au/initiatives/sg/servicetypes.html

[45] Dublin Core is a metadata standard that describes online resources according to a specific system and enables the end users to find resources, for more information go to http://dublincore.org/

gateway services the Dublin Core was not applied, instead an own metadata standard based on Dublin Core was developed.[46]

The National Library of Australia has developed a checklist of content, functional and business characteristics to provide the gateway services with "a common framework for participating in the cooperative development of both national and overseas gateways".[47] This list is a set of guidelines that amongst others state that the resources must go through a selection process to ensure high quality level and relevance and also that there "should" be a written selection criteria policy.

Roxanne Missingham refers to the gateway services as portals or subject gateways, and she divides them into three different types; "portals for a defined user group", "portals for subject areas", and "portals for a special type of material".
The first type – defined per user group is of the kind as the educational gateway service called EdNA Online.[48]

The second type, "portals for subject areas" is as for example the AGRIGATE, an information gateway for researchers of agriculture. This type of service does not include nominated online resources if they do not meet selection criteria since the quality issue is fundamental to this type of service.[49] With nominated means online resources that the public suggest should be included in a gateway service.

The third type, "portals for a special type of material" are not produced within the academic community, but produced by single organisations. Government information is the focus of the largest special material portal called the Commonwealth Government Entry Point.[50]

As mentioned on the previous page, there are about 18 running gateway services in Australia that cover a large number of subjects. Services that are included, are e.g. AGRIGATE (agriculture), AustLit: Australian Literature Gateway (literature), AVEL - Australasian Virtual Engineering Library (engineering, information technology), EdNA (education), LawAccess Online (law), MusicAustralia (music), AMOL (Australian museums & galleries online), which is a gateway service to Australian museums and galleries, or ATUA (Australian trade union archives) that covers the labour issues, or PictureAustralia that links to pictorial images.[51]

According to the *Best practice checklist for Australian subject gateways* the gateway services should try to fulfil the user expectations such as:[52]
1. access to content in real time
2. access free of charge

---

[46] Missingham Roxanne, 2000, p. 40-47.

[47] For more information see the website of the National Library of Australia, and the *Best practice checklist for Australian subject gateways* [Last checked 23/11-2002]

[48] Missingham Roxanne, 2000, p. 40-47. EdNA Online (Education Network Australia), is a network of and for the Australian education and training community, accessible via http://www.edna.edu.au [Last checked 23/11-2002]

[49] ibid. AGRIGATE, accessible via http://www.agrigate.edu.au For more information on the AGRIGATE selection criteria, see http://www.agrigate.edu.au/selection.html [Last checked 23/11-2002]

[50] Accessible via http://www.fed.gov.au [Last checked 23/11-2002]

[51] For more information about the different gateway services, go to the website of the National Library of Australia, accessible via http://www.nla.gov.au/initiatives/sg/gateways.html [Last checked 23/11-2002]

[52] *Best practice checklist for Australian subject gateways*, http://www.nla.gov.au/initiatives/bestpractice.html [Last checked 23/11-2002]

3.5.2. Denmark – the DEF project

The DEF – Denmark's electronic research library is responsible for the maintenance and development of the DEF portal. This project originates from an initiative launched back in 1996-97 and was granted the total budget of 200 million DKK for the period 1998-2002. The DEF committee consists of representatives from the Danish ministry of culture and the ministry of science, technology and innovation and is co-ordinated by the National Library Authority. One of their tasks is to develop the DEF project.[53]

The main objective of the DEF project is to "support the Danish research and education by strengthening the development of the Danish research libraries and creating a coherent and simple access to the information resources of these libraries". Another aim is to provide better possibilities for gaining access to a large number of online resources on the Internet, by converting printed catalogues to electronic ones. All Danish research libraries collaborate on establishing a common access to the libraries' resources. By creating and maintaining the DEF portal the wish is to achieve these aims.[54] Nothing is stated about selection criteria on the DEF website.

The establishment of the gateway services is done within subject areas such as e.g. business economics, food science and food technology. According to information specialist Adrian Price each gateway is linked together under the DEF Guide, which is a metadata-based national gateway, where a robot harvest the Dublin Core metadata embedded in the homepages of the participating libraries.[55]

3.5.3. Norway – the Bibsys gateway

The Bibsys gateway service is a national Norwegian initiative that is monitored and co-ordinated by the Bibsys editorial board. Bibsys developed the service in co-operation with universities and colleges in Norway.[56] The board is responsible for the content, management and development of the gateway service and the participating libraries provide the service with online resources. Bibsys is responsible for development and maintenance of databases and co-ordinates the work amongst the participating libraries that catalogue the resources.[57]

The target groups are first and foremost students and employees at the Norwegian universities and colleges, but the gateway service is also made accessible to the public. The subjects represented in the gateway service are those that are taught at the universities and colleges and the focus is on Norwegian resources. The Dublin

---

[53] For more information see http://www.deflink.dk/eng/default.asp [Last checked 23/11-2002]
[54] Denmark's Electronic Library, for more information see
http://www.deflink.dk/eng/omdef/omdef.asp [Last checked 23/11-2002]
[55] Price Adrian, Five new Danish subject gateways under development, *Online information review*, 24(1), 2000, p 84.
[56] Bibsys is a national library system for the Norwegian National Library, all university libraries and most college and research libraries in Norway. Bibsys provides these organisations with databases (with physical documents and full-text), electronic periodicals, standards, etc. For more information, see http://www.bibsys.no/om/bibsys-status-e.htm [Last checked 23/11-2002]
[57] Accessible via http://www.bibsys.no/webmnytt/emneport020531.htm [Last checked 23/11-2002]

Core Metadata Standard is applied as well as the Dewey Decimal Classification. The wish of the producers is to provide "greater stability, a common standard of classification and cataloguing, links to high quality resources and control of these links".[58] Nothing is stated about selection criteria on the Bibsys website.

The Norwegian gateway service consists of one gateway that provides access to a large number of subjects in one single interface and system. This service was launched in April 2002 and at that time provided access to approximately 2100 online resources. This is a new and small service with the aim of providing links to adequate resources to Norwegian users.

3.5.4. United Kingdom – RDN, ADAM, IMesh Toolkit project and the Roads project

The RDN – Resource Discovery Network[59] was established during 1997-99 as a network organisation comprising of a central organisation, called the Resource Discovery Network Centre. A set of independent organisations called "hubs" participate as service providers. Hubs are the same as gateway services. Over sixty participating educational and research organisations take part in the RDN collaboration. RDN brings together under a common service, technical and business framework a wide spectre of gateway services.
   The King's College London runs the RDN and UKOLN at the University of Bath is a consortial partner with a special responsibility for interoperability issues. The Resource Discovery Network Centre has responsibility for promoting, sustaining and developing the RDN and the supporting "hubs" are responsible for developing their collections and maintaining framework policies to ensure quality, consistency and interoperability across the RDN.[60] RDN takes also part in the Renardus project.[61]

The target group is the academic and research community in the UK and each hub provides access to online resources by subject. According to RDN Collections Development Framework:

> All hubs **must** provide a scope of collection statement. This statement
> **must** define the gateway's collection development aims, and indicate
> the breadth and depth of the collections, including what is included in
> / expressly excluded from the collection(s).
> Information **may** be presented by subject, resource type, resource
> formats (where different from resource type), language, geographical
> coverage, chronological coverage.
> A scoping statement must define target audiences for which the
> collections are intended and specify relations with other
> complementary academic or commercial collections (both national
> and international).
> (---)
> Information **must** be provided on how resources are discovered prior
> to inclusion (e.g. by individuals located centrally or at a range of

---

[58] Accessible via http://www.bibsys.no/om/bibsys-status-e.htm [Last checked 23/11-2002]
[59] Accessible via http://rdn.ac.uk [Last checked 23/11-2002]
[60] Dempsey Lorcan, The subject gateway: experiences and issues based on the emergence of the Resource Discovery Network, *Online Information Review*, 24(1), 2000, p. 16.
[61] Accessible via http://www.renardus.org [Last checked 23/11-2002]

collaborating sites, by robots, user suggestion etc.).[62]

When it comes to resource management and maintenance the recommendations are that:

> This section **should** provide information about how resources are managed, maintained, reviewed, edited, and where appropriate, de-selected. In particular, it **must** provide *criteria* to guide the process of record editing and de-selection including guidelines pertaining to the implementation of these criteria.[63]

Selection criteria may vary within the different hubs but some information must be included:

> Information on evaluation criteria applied to resources considered for inclusion in a collection, including implementation guidelines (e.g. implementation on how and by whom these criteria are applied) **must** be made available.[64]

Today, RDN provides access to approximately 60 000 descriptions of online resources.[65]

The participating service providers, hubs, are established around faculty-level subjects. Each hub can provide one or more gateway service, such as EMC (engineering, maths, computing), BIOME (biomedical sciences), Humbul (humanities), SOSIG (social sciences, business, law), Psigate (physical sciences), EEVL (engineering, mathematics and computing).

One of the gateway services that are worth mentioning is ADAM: art, design, architecture & media information gateway).[66] ADAM is funded by eLib (Electronic Libraries Programme) and JISC (Joint Information Systems Committee) and directed by a Steering Group made up of representatives from the ADAM Consortium Partners. ADAM is jointly developed by nine Consortium partner institutions, the major partners are the Surrey Institute of Art and Design (lead partner), the Tate Gallery, the National Art Library, etc.

ADAM applies the major standards (DDC, Dublin Core, Z39.50) and takes part in international collaborations such as the development of the Dublin Core Metadata Element Set, an initiative managed by OCLC.

One of the software developing projects was the IMesh Toolkit project. The IMesh Toolkit project was funded in 1999 by JISC/NSF on a three-year basis. The project partners included the Internet Scout Project, UKOLN, ILRT (Institute for Learning and Research Technology, University of Bristol) and Loughborough University. The aim of the project was to encourage collaboration amongst international gateway services and also to build on existing gateway service software to develop a

---

[62] Jennings Simon, *RDN Collections Development Framework*, Version 1.2, 2002, accessible via http://rdn.ac.uk/publications/collections/cdframework3.doc

[63] ibid.

[64] ibid.

[65] Accessible via http://rdn.ac.uk/about/history/ [Last checked 3/2-2002]

[66] Accessible via http://www.adam.ac.uk [Last checked 23/11-2002]

configurable, reusable and extensible toolkit for gateway service providers. The project no longer exists.[67]

Another project similar to IMesh is the Roads project based at Access to Networked Resources section of eLib (the Electronic Libraries Programme). The Roads partners were UKOLN, ILRT and the Department of Computer Science at Loughborough University of Technology. The project was funded by JISC. Roads is a software toolkit which enables the set up and maintenance of gateway services. This software is an open-source software toolkit and therefore enables others to develop the software and build gateway services according to their needs and acquirements. This project no longer exists.[68]

3.5.5. United States – AgNIC, OCLC, CORC, Scorpion and Signpost project

There is no common, collective or joint national effort to gather online information resources in USA, as it is e.g. in Australia, Norway or United Kingdom. Instead there are a variety of mid-level or regional networks consisting of universities, US government departments, federal agency backbone services, private associations as well as international partners.

One example of a quite large gateway service is the agricultural service called AgNIC, an equivalent to the Australian AGRIGATE. AgNIC stands for the Agriculture Network Information Center. It is run by the National Agricultural Library in Maryland and an alliance of land-grant universities and other agricultural organisations.[69] A large number of educational and research institutions take part in the work concerning the selection and management of online resources. Metadata standards such as Dublin Core and protocol Z39.50 are under consideration and yet not applied. The service was launched back in 1994-95 and is still ongoing.

The alliance partners in AgNIC are responsible each for a narrow subject area and provide expertise along with the resources in that specific subject area. According to the AgNIC Alliance guidelines the partners need to include disclaimers to ensure appropriate use of their services. Nothing is stated about any quality control or selection criteria and some alliance partners provide this information publicly and some do not. For example, the AgNIC gateway provides access to "quality agricultural biotechnology information on the Internet".[70] The Agricultural Biotechnology provides both a disclaimer and information about the scope of the service and also a list of their selection criteria, the following aspects are presented:

- authority and accuracy
- purpose and content
- currency
- design, organisation and ease of use

They also provide the users with guidelines and a checklist that the users can use to evaluate online resources.

[67] Accessible via http://www.imesh.org/toolkit/
[68] Accessible via http://www.ilrt.bris.ac.uk/roads/ [Last checked 24/5-2003]
[69] Accessible via http://www.agnic.org [Last checked 23/11-2002]
[70] Accessible via http://agnic.umd.edu/ [Last checked 24/5-2003]

As pointed out in the introduction to this section, one major organisation, the OCLC consortium, takes part in the online information resource development and management in the United States.[71] OCLC is a library and computer service and research organisation that was founded through a college and university network in the state of Ohio. OCLC works closely with the Library of Congress and the majority of the libraries in the United States and also libraries outside USA. OCLC initiated several international projects that deal with tools and methods for creation and development of gateway services like the Dublin Core metadata standard and other projects, such as CORC and Scorpion projects.

The CORC project – CORC is a system for hosting and supporting gateway services, in other words a metadata management system, and not a gateway service. CORC develops tools and systems to enable libraries to provide enhanced access to retrieved online resources through a single, centralised database. The system therefore relies on large-scale co-operation among thousands of libraries within and outside the United States. It supports multiple metadata schemes like Dublin Core, RDF or XML, and applies search protocols like Z39.50. Elements like quality control are conducted at the library level, e.g. the selection criteria are applied by the participating libraries and not within the CORC system.[72]

Another example of a large gateway service is the Internet Scout Project, a project at the Department of computer sciences at the University of Wisconsin-Madison. This is a gateway service, which not only provides access to quality control online resources, but also to weekly publications, mailing lists, etc. The target group is the academic community. Included in the service are the resources of the former Signpost gateway service, which does not exist any longer.[73]

3.5.6 Renardus - European broker service initiative

The Renardus broker service was launched in 2002 as an offspring to a Renardus pilot project.[74] The Renardus partners consist of twelve organisations from Finland, Germany, United Kingdom, Sweden, Denmark and the Netherlands, the service is maintained by the Renardus Consortium.[75]
   The purpose of the Renardus broker service is to provide access from one single

---

[71] OCLC (Online computer library center), an nonprofit membership library and computer service and research organisation, accessible via www.oclc.org [Last checked 23/11-2002]
[72] Hickey Thomas B., CORC: a system for gateway creation, *Online Information Review*, 24(1), 2000, p. 49-53.
[73] Accessible via http://scout.wisc.edu/addserv/signpost/index.html [Last checked 23/11-2002]
[74] The Renardus pilot project run from January 2000 until June 2002 and was funded by the European Union, it was a collaborative project with partners from national libraries, universities and research and technology centres across Europe. Accessible via http://www.renardus.org/about_us/organisation.html [Last checked 8/2-2003]
[75] For more information about the different subject gateways go to http://www.renardus.org [Last checked 8/2-2003]

user interface to several QCSG services distributed across Europe.[76]

In order to participate in Renardus the participating services have to meet the criteria for the agreed definition of what a QCSG is. The services have to fulfil some technical and metadata standards.[77] The services within Renardus apply the metadata standard Dublin Core and the gateways must create a subject mapping from their local classification scheme to Dewey decimal classification system and undertake a mapping of their local metadata model to the Renardus data model.[78]

Since the Renardus service is relatively new not much is written about it and the documented information derives mostly from the Renardus partners. Their documentation about the service is predominantly positive.

Titia van der Werf, one of the project co-ordinators from the Koninklijke Bibliotheek, states about the usefulness of the Renardus service is that the users can go directly to one comprehensive gateway service with single user interface instead of numerous ones that only cover parts of the subjects. The concept of Renardus is to provide a single entry point to information for the academic user community. In the future this service might evolve into a portal also providing links to science shops, campus sites and university course information for students, student travel agents and other facility providers. [79]

The British information specialist and co-ordinator Lesly Huxley[80] points out several potential benefits for the participating Renardus gateway services. One is that collaboration between participating gateway services reduces duplication of effort by service providers in areas of metadata creation, abstracting and indexing. Other benefits are that the participating gateway services could gain from the collaboration when it comes to improved sustainability and also by achieving a stronger position against international competition.[81]

According to Dutch information specialist Marianne Peereboom the users will benefit by using the Renardus service since they can search and browse in large linked distributed databases through one interface, which saves both time and effort.[82] This means that the users do not have to locate and search databases one by one, having to learn lots of different interfaces and search strategies.
Other benefits are that the large collections of resources provide access to many more subjects. Thus by using Renardus the users may discover other services that were unknown to them and conclude which services are best for his/her purposes.[83]

---

[76] Huxley Lesly, Renardus: fostering collaboration between academic subject gateways in Europe, *Online Information Review*, 25(2) 2001, p 121.
[77] Accessible via http://www.renardus.org   [Last checked 8/2-2003]
[78] Accessible via http://www.renardus.org   [Last checked 8/2-2003]
[79] Accessible via http://www.renardus.org/about_us/talk/talk1.html
[80] Lesly Huxley leads the ILRT Renardus team responsible for dissemination and support for the project.
[81] Lesly Huxley, *Renardus: Follow the Fox!*, Cultivate Interactive, 1, 2000, accessible via http://www.cultivate-int.org/issue1/renardus/ [Last checked 8/2-2003]
[82] Accessible via http://www.renardus.org/about_us/workshop/background_files/frame.htm [Last checked 8/2-2003]
[83] ibid.

3.5.7 Summary of the international section

The governmental bodies take active part in the development, management and funding of the gateway services in Australia and Norway, but also to a certain point Denmark and Great Britain. This cannot be said about the United States, where the initiatives behind the gateway services are usually the universities or federal organisations.

Australia and Norway are the only countries that clearly specify that they focus on providing access primarily to their national resources rather than focusing on international ones. By national resources is meant those that are produced within the country. The target group is the Australian and Norwegian community.

Publicly stated selection criteria are not common. Some of the services only state that they do apply some sort of selection criteria but it is not always clear what type of criteria is used.

The implementation of different technologies, standards and guidelines evolves from international projects such as DESIRE, Dublin Core or Renardus, and these projects are in one way or another entangled in each other.

The Signpost gateway service, the IMesh Toolkit project and the Roads project are all past projects that for different reasons do not longer exist. One explanation could be that they were meant to evolve into other projects and services, another could be that long-term funding is still a problem for these types of projects, or that the projects were meant to close down after certain time.

3.6. User opinion, exposition of user surveys
We took part of a survey called *Survey of end user surveys*.[84] This survey looks into several surveys and reports that were conducted in Europe, USA and Canada and where the respondents came from the academic community. The focus is on user needs, opinions and requirements about gateway services in general, and gathers user feedback on technical information, interface usability and on the quality and presentation of resources. The survey also summarises surveys from the participating Renardus gateway services on user experiences and also presents three user requirement reports.[85] The surveys and reports took place on different occasions from 1996 – 2000 and the authors point out that some of the oldest results might be somewhat outdated.

Here follows a summary of the conclusions of the user needs and requirements concerning quality and usability issues.
When it comes to the level of difficulty with the use of Internet in comparison with gateway services, most respondents state:

---

[84] Becker Hans J., Klaproth Frank, Lepschy Petra, Survey of end user surveys, 2000, accessible via http://www.renardus.org Home > About Us > Project Archive > Project Deliverables [last checked 1/2-2003]
[85] ibid. The evaluated gateway services are DutchESS, EELS (Engineering electronic library, Sweden); EEVL (Edinbourgh engineering virtual library); EULER (European libraries and electronic resources in mathematical sciences); FVL (Finnish virtual library); SOSIG (Social science information gateway); and SSG-FI (special subject gateways to high quality Internet resources for scientific users). The three user requirement reports are *Results of evaluating tools and methods with user groups* and *Requirements Survey for Quality of Service in Distributed Information Systems* (both by DESIRE) and the *PRIDE Requirements and Success Factors* report from the PRIDE consortium.

that they have difficulties with the use of the Internet, at least to a certain degree, these difficulties do not apply to the use of a subject gateway. Generally, users are more at ease with finding their way around in gateways and the services they have to offer than is the case with the Internet.[86]

The conclusion is that the users seem to prefer the functionality of gateway services prior to the Internet. When it comes to resource quality, users appreciate quality resources and find the evaluation and categorisation of resources as very important. The actuality of the resources is also an important factor. Another conclusion is that the users expect a wide variety of resources and that the requested types of information vary with the users' different subject areas.[87]

There were different views in different surveys on the issue of resource quality. In one of the user surveys most of the respondents stated that the resources that they found were not close to what they had expected. Half of the respondents said that they were not satisfied with the level of quality of the resources. Some of the reasons that the respondents were dissatisfied were that certain subject areas were not covered well enough, there were too many broken links, or that they did not find what they were looking for.

The surveyors assume that "the lack of sufficient resources seems to be more of a problem to respondents currently using the database, than the issue of quality".[88] Another survey showed that the users' opinions varied a lot, some felt that the range of resources was sufficient, others felt that there were few quality resources and some felt that their subject area was not covered well enough. Overall they asked for more resources in the gateway service.[89]

Another user opinion was that resource descriptions were regarded as a very useful feature and as a good indicator of the usefulness of a website.
Other results showed that users were seeking some form of quality assurance especially in electronic media, for example timeliness, reliability and suitability.[90]

One of the positive aspects with gateway services that the survey points out is that the users were more at ease finding their way in the services than on the Internet.

On the other hand the survey shows that fulfilling the user needs is difficult for the services. Some of the users were not satisfied with the level of quality of the resources. It was also difficult for the users to find suitable resources within their subject area. The survey shows that timeliness, reliability and suitability are problem areas, however it is not specified what is meant with for example reliability. By reliability do the authors mean that a resource has a reliable source?
This leads to the question: can gateway services guarantee access to qualitative online resources?

[86] Becker Hans J., Klaproth Frank, Lepschy Petra 2000, p. 3,
[87] ibid.
[88] Becker Hans J., Klaproth Frank, Lepschy Petra, 2000, p. 8.
[89] Becker Hans J., Klaproth Frank, Lepschy Petra, 2000, p. 10.
[90] Becker Hans J., Klaproth Frank, Lepschy Petra, 2000, p. 15.

4. Results of the survey

In this chapter we present most important data from the data that we gathered about the Swedish gateway services. We were aware from the beginning that we could not conduct a complete survey of the services and that was not part of our purpose. Our data gathering can be described as very broad at first, since it was our aim to get a total and widespread view of what the services have to offer.

   We compiled ten questions and by trying to answer them, hoped to get an overview and to learn about the services. The questions were about how to define the services, the aims and target groups of the services, the selection criteria and different approaches to retrieving information such as metadata, resource descriptions, search and browsing options and classification systems.

We examined the gateway services by looking at the information that was publicly stated on their websites and we have not been in personal contact with the management or editorial staff and we have not included material written elsewhere.

   After the completion of the survey we examined the material and decided to limit our survey to three major questions. This was also a limitation according to our purpose.

   During the work process we discovered that it was difficult to answer all ten questions in the survey just from what was publicly stated on their websites. All questions and the entire survey are available in chapter 5. Material to this survey was compiled during September 2001 – January 2002 so any changes after that date were not taken into consideration if not mentioned.

4.1. Presentation of the Swedish gateway services

The eleven gateway services are the ones that are listed on the website of the Royal Library as "quality assessed information resources on the Internet".[91] Every gateway service is also accessible through their own entry site on the homepage of their owner, i.e. national resource library.

   Table one presents each gateway service by title, by the national resource library that produces the service and by what subjects the gateway service specialise in.

---

[91] The used terminology in Swedish is "kvalitetsbedömda informationsresurser på internet" which we interpret as quality assessed information resources on the Internet. In the English version of the page the terms "quality-rated information resources on the Internet" are used, see http://www.kb.se/BIBSAM/english/nrl/first.htm. But we chose the term "assessed" instead of "rated" since the former one is more appropriate and generally used within the information community.

Title of the service	National resource library	Subjects
Agora[92]	Uppsala University library	Humanities
Biogate	The Library of Ecology and Lund University library	Biological sciences
Diseases, Disorders and related topics and Biomedical information resources & services – by subject[93]	The Karolinska Institutet University Library	Medicine
EELS[94]	Engineering E-library, Royal Institute of technology library[95]	Technical sciences
ESSEL[96]	Uppsala University library	Geology and physical geography
Women's History Collections[97]	The library of Women's History Collections Göteborg University library	Women's, men's and gender studies
NOVAGate	The Swedish University of agricultural sciences together with the other libraries of the NOVA University in Denmark, Finland, Iceland, Norway	Forestry, veterinary, agricultural, food and environmental sciences
Library of education and psychology[98]	Library of psychology and education and Stockholm University library	Psychology and education
Rättskällan	Stockholm University library	Law
SamWebb	Göteborg University library	Social sciences
The Library Web	Stockholm school of economics	Economics

Table 1. Swedish gateway services, by name, subject and national resource library.

---

[92] Agora is an acronym for "A gateway to online resources in the arts and humanities".

[93] The gateway service from the Karolinska Institutet University Library consists of three different services, called *Diseases, Disorders and related topics*, *Biomedical information resources & services – by subject* and *SveMed+*. The first two are gateway services that are evaluated here, but the third one is a bibliographic database that contains references to articles within the subject of medicine. So in spite the fact that *SveMed+* is a bibliographic database the Royal Library includes the database on their website of the Swedish gateway services. Since *SveMed+* is not a gateway service it is excluded from this evaluation.

[94] EELS is an acronym for Engineering E-Library, Sweden.

[95] The following Swedish Universities of Technology Libraries co-operated in creating EELS: Royal institue of technology library, Studsvik Library, Chalmers library (Chalmers university of technology), Luleå university library, Linköping university library and Lund university library.

[96] ESSEL is an acronym for Earth Science Sweden Electronic Library.

[97] The service does not have a proper title so we label it as *Women's history collections* since the library of Women's History Collections is responsible for the gateway service.

[98] The service is also without a title so we label it *Library of education and psychology* after the producer Library of education and psychology.

Here follows the three major issues that we focus on in this chapter. The first issue is the definition of the Swedish services. Are they subject gateways or are they QCSGs? We try to define each service by type, following the definitions in the literature study. By this question we try to answer the first question stated in our purpose, i.e. what is a gateway service more specifically from a Swedish point of view.

The issue of aims and target groups of the services and the issue of quality control is in line with our second and third question in the purpose. Not only do we believe in the importance of implementing tools such as aims and selection criteria that enable quality control but also in the importance of publicly stating these aims, selection criteria and also target groups. We wanted to see how the Swedish gateway services have approached these issues.
Each question is presented by an explanation and then followed by an answer in form of tables and complementary discussions about the results.

4.2. Defining the service, is it a subject gateway or a QCSG?

The eleven gateway services provide a variety of different services. The functionality of these services and what they provide to the users was unclear to us. That is the reason as to why we needed to categorise them. To apply the Traugott Koch's categorisation of the services, i.e. a) subject gateway and b) QCSG, felt applicable.

It is also important to understand the service's present qualifications and possibilities in order to see the future ones. We wanted to find out whether the staff publicly proclaimed a definition of the service. If a service is defined as a subject gateway or a QCSG by its staff, it is also interesting to see if the service fulfils this definition. It indicates if there is an intellectual effort behind the work process and also if it is comprehensible for the user what the service stands for and what it provides.

The question how we define the Swedish gateway services is one of the major issues in this thesis. We concluded that it is not a simple task to distinct them from each other since the boundaries of each term are often entangled with each other. We concluded that the difference between a subject gateway and a QCSG lies in the level of appliance of quality control, since the high quality control is a "trade mark" of the latter. A subject gateway does not include the high quality services provided in a QCSG.

Here follows a summary of the results:

	Subject gateway	QCSG
Agora		x
Biogate	x	
Diseases, Disorders and related topics and Biomedical information resources & services – by subject	x	
EELS		x
ESSEL	x	
Women's History Collections	x	
Novagate		x
Library of education and psychology	x	
Rättskällan		x
SamWebb		x
The Library Web	x	

Table 2. Definition of each service: subject gateway and QCSG.

Table two displays the definition of each service according to Traugott Koch´s definition of a subject gateway and a QCSG. The results show that at least five of the Swedish services may be defined as QCSGs.

4.3. Does the service publicly account for its aims and target groups on the website?

There is a reason as to why these services have been created and the need of overall aims of the service is quite essential. By aims we mean the purpose of the service. By target group we mean the group of end users that the service is focusing on. The question is not "if" there are any aims, but are they publicly stated and if so "what" do they state and "how" are they accounted for. The aims should be publicly stated for the benefit of the users.

Here is a summary of the results:

Agora	Yes	
Biogate		No
Diseases, Disorders and related topics and Biomedical information resources & services – by subject		No
EELS	Yes	
ESSEL		No
Women's History Collections		No
NOVAGate	Yes	
Library of education and psychology		No
Rättskällan	Yes	
SamWebb	Yes	
The Library Web		No

Table 3. The table displays if the gateway services state their aims on their website or not.

As seen in table three, six of the gateway services do not provide any account of their aims, while five of the services do. *Agora*, *NOVAGate*, *EELS* and *SamWebb*'s aim is to provide access to relevant resources in order to satisfy their target groups. *Rättskällan* points to the fact that as a national resource library it is their task to build a gateway to quality assessed judicial online resources.[99] As an example, the aims of *Agora* are:

> to obtain and provide access to national and international quality resources within the field of humanities and to co-ordinate and rationalize the work that is simultaneously conducted at different institutions. The target groups are researchers, students, teachers and librarians within the Swedish academic community, also the international academic community and everyone with a specific interest in the subject field covered by the service.[100]

The *Diseases, Disorders and related topics* site includes a disclaimer chapter stating that:

> These pages contain links to external ('no-charge') resources on the Internet dealing, in particular, with diseases and disorders, but also with a few other health/medically related topics.[101]

The producer does not take any "responsibility for the design or contents of this medical Web guide".[102] The *Biomedical Information Resources & Services - by Subject* site includes the same disclaimer. We conclude that the disclaimer is not a

---

[99] Accessible via http://www.sub.su.se/rattskallan/om.asp [last checked 15/2-2003]
[100] Accessible via http://Agora.ub.uu.se/presentation.cfm [last checked 22/9-2002]
[101] Accessible via http://www.mic.ki.se/Diseases/Disclaim.html [Last checked 15/2-2003]
[102] ibid.

statement of aims or objectives, but a statement that the staff cannot be hold responsible for the content or design of the included resources.

The target groups are defined by three of the gateway services, namely AGORA, EELS and SamWebb.

   AGORA target group consists of researchers, students and librarians within the Swedish academic community as well as the international academic community and also everyone who has a special interest in the subject field covered by the service. EELS target group is defined as the technical universities. SamWebb defines the target group as researchers and students on a higher educational level.

4.4. Does the service publicly state on the website that it applies selection criteria?

With quality selection criteria we mean the criteria that can be used to assess and control the quality of the web resource. There are many aspects that an editorial staff should take into consideration when collecting web resources, e.g. is the resource subject relevant, up to date and reliable, valid, etc. The selection process involves that the resources are harvested, gathered, selected and classified by subject, and each resource is manually controlled and evaluated according to specified criteria. For an inclusion in a gateway service the resource must fulfil the set of selection criteria that the editorial staff has compiled.

It is important to publicly state what type of quality control and what selection criteria are applied within the service, for the benefit of the users. The DESIRE project states that:

> There are a number of advantages in developing a formal selection
> policy for a gateway and publishing it on your site:
> • it helps users to appreciate that the service is selective and quality
> controlled
> • it helps users to understand the level of quality of
> information they will find when using the service
> • it helps gateway staff to be consistent in their selection and to
> maintain the quality of the collection
> • it can be used to train new staff
> • it ensures consistency in collections that are developed by a
> distributed team[103]

We looked into the information about the services to see if the service publicly states any selection criteria, and if that was the case what type of criteria they were. We also looked for any information about the source behind the criteria, for instance if they used any known criteria such as for example the DESIRE criteria.

---

[103] Accessible via http://www.desire.org/handbook/2-1.html [last checked 16/2-2003]

Here is a summary of the results:

	Yes	No
Agora	Yes	
Biogate		No
Diseases, Disorders and related topics and Biomedical information resources & services – by subject		No
EELS	Yes	
ESSEL		No
WHC		No
Novagate	Yes	
Psychology & education		No
Rättskällan	Yes	
SamWebb	Yes	
The Library Web		No

Table 4. The table displays which of the gateway services account for any quality criteria.

Table four displays that five of eleven gateway services publicly account for their quality criteria. The criteria differ between the gateway services as presented below. We do not present all quality criteria here, just the most important elements, for more information about the criteria go to Appendix 1. to see each gateway service in question.

Here follows some of the selection criteria that the resources have to fulfil in order to be included in *Agora*:

- It should be stated who is responsible for the content of the information resource, last update, whether the website requires specific software and if there are any user restrictions
- The content of the resource should provide well-structured, basic, comprehensive or specific information within the subject area. If the resource is relevant for the Swedish academia and research community it should be included in the service, if it is of local, commercial or private interest it should not.
- Design and structure should facilitate the navigation of the resource.[104]

EELS apply the whole and Rättskällan some of the quality selection criteria derived from the DESIRE quality criteria list. Here follows some of the EELS selection criteria elements:

- Substantiveness

  o Is the information substantive?

  o Is there value added information?

---

[104] Accessible via http://Agora.ub.uu.se/presentation.cfm [last checked 15/2-2003]

- Comprehensiveness

    o What is the depth of the information?

    o What is the breadth of the information?

- Authority and Reputation of Source

    o Is the source attributable to a reputable author or organisation?

- Validity

    o How valid is the content of the information?

    o Is the information what it appears to be?

- Composition and Organisation

    o Is the information clearly organised?

- Uniqueness[105]

Here follows some of the Rättskällan selection criteria elements:
Is the website's purpose and aim clearly presented? Who is the information for and what is the purpose with it? Is the material of primary or secondary source? Is the information free of charge or not?

  Other criteria applied by Rättskällan are: reliability criteria that check whether the information is complete and whether the material is objective and correct, authority criteria check the producers behind the resource, the actuality criteria when the material was produced, whether the information is regularly updated. Design criteria check for the structure of the resource, if it is logically structured and easy to navigate. Technology criteria look into the user friendliness and the search options.[106]

NOVAGate selection criteria state among other things that:

> To be included in the database a resource must fulfill certain selection criteria. NOVAGate is a selective service, and does not attempt to catalogue the Internet!
> When reviewing sites for inclusion, some of the questions which cataloguers consider are the following:
>
> - Is the resource within the subject area covered by NOVAGate?
>
> - Is the resource aimed at the NOVAGate target audience, primarilly researchers and students?
>
> - Does the resource contain more than just administrative information?
>
> - Is the web site well organized, easy to use, accessible, stable?

---

[105] Accessible via http://eels.lub.lu.se/qualcrit.html [last checked 15/2-2003]
[106] Accessible via http://www.sub.su.se/rattskallan/om.asp [last checked 15/2-2003]

- Is the web site accurate, current and up to date and appear to be durable?[107]

SamWebb selection criteria state among other things that the resources must be within the social sciences subject field must be relevant for research and academic studies, up to date and regularly updated. The resources can be free of charge but also databases and similar material that is not free of charge can be included.[108]

The *Diseases, Disorders and related topics* and *Biomedical information resources & services – by subject* is the only service stating that it does not account for any quality criteria. The site has a disclaimer chapter stating that:

> Visiting these pages could be likened to entering a public bookstore in the sense that it's entirely up to the visitor/reader to critically assess the quality and usefulness of the information offered via these links. For instance, it is probably always wise to reflect a little on the motives behind the author's wish to publish his material on the Net. Although, in building & maintaining this sorted list of links, efforts have been made only to select resources which offer both serious and relevant information, inclusion in the list does not necessarily imply that the material pointed to is of generally approved scientific accuracy and reliability.[109]

In conclusion six services are defined as subject gateways and five services are defined as QCSGs. Five of the services have publicly stated their aims of the services and six have not stated any aims at all and only three of the services have defined the target groups. Five of the gateway services account any type of selection criteria and six do not.

As said at the beginning of this chapter we present only the most important parts of the gathered data about the Swedish gateway services in the chapter above. In the next chapter follows a discussion based on data from this chapter and the material from the literature study. The whole survey is presented in the next chapter.

---

[107] Accessible via http://novagate.nova-university.org/gateinfo.html [last checked 15/2-2003]
[108] Accessible via http://www.ub.gu.se/samwebb/about.html [last checked 15/2-2003]
[109] Accessible via http://www.mic.ki.se/Diseases/Disclaim.html [last checked 15/2-2003]

5. Presentation of the complete survey

This chapter presents our complete survey of the eleven Swedish gateway services. When we began to investigate the services we found that there was practically no publicly written information about them. We therefore felt a need to look into the services and to gather the necessary information about them. We wanted to discuss the importance of relevant public information of these services. For that reason we made the conscious choice to base the survey only on publicly stated information on the websites of the services, i.e. information available to the users. It is also our wish that this material might be useful to the readers who want to get accustomed with the services. Material to this survey was compiled during September 2001 – January 2002.

1. Defining the service, is it a subject gateway or a QCSG?

AGORA (humanities):
As stated in the presentation on the website, "AGORA is a gateway to online high quality resources in the arts, humanities and theology. It is operated as a joint enterprise with subject editors/librarians responsible for specific subjects. The editors are recruited from Swedish academic and special libraries all over the country. A central editorial board responsible for co-ordination and technical maintenance of the database is housed at the Uppsala university library". *AGORA* has the necessary database structure, high quality control conducted manually by the editorial staff, metadata, and advanced search and browsing options, enough to be defined as a QCSG.

Biogate (biological sciences):
We define *Biogate* as a subject gateway, it has the database structure that allows advanced search and browsing options, but there is nothing written on the website about quality control. The assumption is though, that since the resources are described with metadata, some form of quality control must have taken place, but not enough to be considered as a QCSG.

Diseases, Biomedical, SveMed+ (medicine):
The website of the library of the Karolinska Institute is compiled by a number of services and among them are three websites that are included in our eleven gateway services. These three are the *Diseases, Disorders and Related Topics* site, the *Biomedical Information Resources & Services - by Subject* site and the *SveMed+* site.
The *Diseases, Disorders and Related Topics* site is a link list. It provides a set of links to Web resources that are compiled by subject, i.e. general health issues like diseases and disorders, but the resources are compiled without any other quality selection.
The same applies to the site *Biomedical Information Resources & Services – by Subject*, it gathers and compiles resources by subject, i.e. general biomedicine, also a link list.
SveMed+ is a bibliographic database that contains references to articles within the subject of medicine and is therefore not included in the evaluation.

EELS (technical sciences):
A QCSG, or as quoted: "an information system for quality assessed information resources on the Internet". It has the database structure, advanced search and browsing options, high quality control conducted manually by the editorial staff, metadata.

ESSEL (geology and physical geography):
A subject gateway, since it has a database structure, advanced search and browsing options, personnel responsible for the gathering of resources and some kind of resource selection.

NOVAGate (forestry, veterinary, agricultural, food and environmental sciences):
According to the NOVAGate website, "Novagate is a gateway to selected Internet resources in the fields of forestry, veterinary, agricultural, food and environmental sciences."
I.e. the service provides access to selected web resources within these specific subjects. The service includes descriptions of and links to bibliographic and full-text databases, but also "directories, events, Internet resource guides, training material, and web sites of key organisations, within the above subject areas".
"The database covers Nordic resources as well as European resources and those of international organisations."
The gateway applies certain selection criteria when selecting web resources. The NOVAGate staff searches the Internet regularly for relevant and substantial resources from Scandinavia and the rest of Europe and if approved, these are included into the database. The service has a database structure, advanced search and browsing options, high quality control conducted manually by the editorial staff and metadata, which equals a QCSG.

Library of education and psychology (psychology and education):
A link list. The website has no database structure, no search and browsing options, no quality control, it provides nothing more than a list to certain links related to the subjects education and psychology and also a couple of hyperlinks to databases and subject guides situated at the library of the University of Stockholm. This site is accessed to through the same homepage.

Rättskällan (law):
A subject gateway, or as stated on the website: "Rättskällan, the national gateway for quality assessed judicial resources on the Internet". The editorial staff, together with other librarians specialised in judicial matters, selects relevant resources according to stated selection criteria. Other law libraries also take part in this project.
The service has a database structure, with simple search and browse options and some quality control.

SamWebb (social sciences):
A QCSG, since it has the necessary database structure, an editorial staff that selects resources according to quality selection criteria and a search and browse option.

The Library Web (economics):
We define this service as a subject gateway since it has the necessary database structure. It provides access to links to databases listed by subject, selected web resources, journals, working papers, dissertations at the SSE, links to search engines like All the web, AltaVista, Northern Light and Adobe PDF Online.
There is no search option apart from the possibility to search for journals and the four search engines.

Women's History Collections (women's, men's and gender studies):
The service is a link list, it provides lists of selected resources. The website lacks a database structure and is situated at the homepage of the Gothenburg university library. There is no search option and the browsing is limited. Some sort of quality control and selection criteria is evident.

2. Does the service publicly account for its aims and target groups on the website?

Agora:
Yes, the service does account for its aims. The aims are to obtain and provide access to national and international quality resources within the field of humanities and to co-ordinate and rationalise the work that is simultaneously conducted at different institutions. The target groups are researchers, students, teachers and librarians within the Swedish academic community, also the international academic community and everyone with a specific interest in the subject field covered by the service.

Biogate:
No aims and target groups are defined.

Diseases, Biomedical, SveMed+ (medicine):
Not really. In the "Information and Disclaimer" chapter on the *Diseases, Disorders and Related Topics* site, the following is stated: "these pages contain links to external ('no-charge') resources on the Internet dealing, in particular, with diseases and disorders, but also with a few other health/medically related topics". The other two sites do not account for any aims.

EELS:
Yes, by stating the following:
"EELS is an attempt to provide mainly the technical universities with links to evaluated resources." Also "in selecting information resources we use on top of subject coverage such as accessibility, maintenance, documentation and reliability of producer organisation." The target group is the technical universities.

ESSEL (geology and physical geography):
No.

Women's History Collections (women's, men's and gender studies):
No.

NOVAGate (forestry, veterinary, agricultural, food and environmental sciences):
Yes, by displaying the purpose of the service, which is to provide the target group with substantial and relevant resources within the specific subject. The relevancy of the resources is assured with the selection criteria that each resource must fulfil. The target group is not defined.

Library of education and psychology (psychology and education):
No.

Rättskällan (law):
Yes, by stating that as a national resource library their task is to build a gateway to quality assessed judicial online resources. The target group is not defined.

SamWebb (social sciences):
Yes, the aim of the service is to gather relevant resources within each subject, divided into certain types and categories. The target group consists of researchers and students on a higher educational level.

The Library Web (economics):
No, not really. General aims for the whole library on the "home" site of the library state the following:
"The Library of the Stockholm School of Economics is the National Resource Library for Business and Economics. The principal collections of electronic and printed resources are within the fields of business and economics, but also law and statistics are covered." So the scope of the whole collection, with printed and electronic resources, is outlined but not the target group.

3. Does the service publicly account for its aims on the website?

Agora:
Apparently some quality criteria must have been applied since the reference to the high quality resources selected by the editorial staff, but the selection criteria are not stated on the website.

Biogate:
Not that is stated.

Diseases, Biomedical, SveMed+ (medicine):
Not really, not more than considering whether the links are "serious and relevant". The following is stated in the "Information and disclaimer" chapter on the *Diseases, Disorders and Related Topics* site: "Visiting these pages could be likened to entering a public bookstore in the sense that it's entirely up to the visitor/reader to critically assess the quality and usefulness of the information offered via these links. For instance, it is probably always wise to reflect a little on the motives behind the author's wish to publish his material on the Net. Although, in building & maintaining

this sorted list of links, efforts have been made only to select resources which offer both serious and relevant information, inclusion in the list does not necessarily imply that the material pointed to is of generally approved scientific accuracy and reliability." So the selection and inclusion of a resource is based on a certain degree of relevancy and seriousness, this implies that a quality selection does take place even if not clearly stated. The other two sites do not account for anything similar as quoted above. Since the *Diseases, Disorders and Related Topics* site is separated from the other two, the assumption that the "Information and disclaimer" chapter does not apply on the other two seems reasonable, but on the other hand some selection must have taken place there as well.

EELS:
Yes. EELS applies certain criteria from the Desire quality criteria list. The following quality selection criteria are used:

Content Criteria: Evaluating the Information

- Substantiveness
  - Is the information substantive?
  - Is there value added information?
- Comprehensiveness
  - What is the depth of the information?
  - What is the breadth of the information?
- Authority and Reputation of Source
  - Is the source attributable to a reputable author or organisation?
- Validity
  - How valid is the content of the information?
  - Is the information what it appears to be?
- Composition and Organisation
  - Is the information clearly organised?
- Uniqueness

Process Criteria: Evaluating the System

- Information Integrity (Work of the Information Provider)
  - Is the information current and up to date?
  - Is the information durable in nature?
  - Is there adequate maintenance of the information content?
- Site Integrity (Work of the Web-Master/Site Manager)
  - Is the site either proven to be, or expected to be durable?

Form Criteria: Evaluating the Medium

- Provision of User Support
  - Is there online Help?
  - Is there documentation?
- Use of Recognised Standards
  - Is metadata provided?
- Ease of Navigation

39

       ° Is it easy to search the resource?

Scope Policy: Considering your Users

- Information Coverage
  - ° Subject Matter
  - ° Acceptable Sources
  - ° Acceptable Types of Resource

ESSEL (geology and physical geography):
Not that is stated on the website.

Women's History Collections (women's, men's and gender studies):
Seems not to, but the editorial staff must have applied some criteria, since the resources have been selected according to subject, or country of origin and have a description.

NOVAGate (forestry, veterinary, agricultural, food and environmental sciences):
Yes, according to the website the gateway is a selective service and it applies certain selection criteria which resources must fulfil in order to be included in the service. Some of the quality criteria are presented on the web site as follows:
"The resource should relate to the subject covered by Novagate.
The resource should be aimed at the Novagate target audience, primarily researchers and students.
The resource should contain more than just administrative information.
The web site should be well organized, easy to use, accessible and stable.
The web site should be accurate, current and up to date and appear to be durable."

Library of education and psychology (psychology and education):
Not that is stated.

Rättskällan (law):
Yes, the service appears to use certain elements from the Desire quality selection criteria, the following as stated in the chapter "about Rättskällan": reliability criteria that check whether the information is complete and whether the material is objective and correct, authority criteria check the producers behind the resource, the actuality criteria when the material was produced, whether the information is regularly updated. Design criteria check for the structure of the resource, if it is logically structured and easy to navigate. Technology criteria look into the user friendliness and the search options.

SamWebb (social sciences):
Yes, the resources should correspond with the field of social sciences, be of relevance for the higher education and research community, as well as up to date and regularly checked. The aim is also to provide resources that are free of charge, but some resources that are not free of charge may also be included.

The Library Web (economics):

No. The only thing that implies that some sort of selection takes place is that the listed resources are titled as "selected web resources".

4. What type of metadata is used to identify the electronic documents?

Agora:
Two different metadata formats are used, namely Dublin Core and RDF (Resource description framework) and in addition a metadata description of the resource called "full record" is also displayed.
All resources are described according to the Dublin Core metadata element set. The descriptions include e.g. title, annotation, publisher, subject, resource type and classification. Annotations are written in Swedish or in the language of the resource.

Biogate:
The Dublin Core metadata standard and DC elements used here are:
Title and what is titled in the page source of the website as "descriptorcontent", could it be description of content?

Diseases, Biomedical, SveMed+ (medicine):
When it comes to the *Diseases and Disorders and Related Topics* site and *Biomedical Information Resources & Services* site, the title, source and sometimes country are displayed. *SveMed+* has the following description of the elements (though all elements are not always included) in the articles:
UI-number
Author
Email address
Original title
English title
Source
URL
Language
MeSH-terms
Keywords
Synonymous keywords
ISBN/ISSN
Type of document
Number of references
Origin

EELS:
The service apply the Dublin Core metadata standard.
The following elements DC elements are used:
Title
URL
Description
Subject Descriptors
Ei Classifications
Resource type
Country of Publishing

Language
Format

ESSEL (geology and physical geography):
The amount of metadata elements describing the resources differs from the following ten elements:
Title
Publishing country
Publisher
First published
Language
Contents
Notes
Type
Index terms
Location
Some of the resources are also described with subject headings.
It is not possible to establish whether they are using Dublin Core metadata standard or not. Title, publisher, language, and type are DC elements but the service does not account for the use of Dublin Core in its source code.

Women's History Collections (women's, men's and gender studies):
Besides the title and a short description of the resource also the country of origin.

NOVAGate (forestry, veterinary, agricultural, food and environmental sciences):
In the short description format the following elements are stated:
Title
Description
Link to the resource (is this an element?)
Description last modified

In the detailed format the following elements are stated:
Title
Alternative title
Description
Subject descriptors
Resource type
Publisher
Publisher country
Language
Link to the resource (same as above, is this an element?)
Description last modified

Library of education and psychology (psychology and education):
Besides title, none is.

Rättskällan (law):
The Dublin Core metadata standard with the following elements:

Title
URL
Source
Description
Related sites
Type of organisation
Geographical area
Language
Date of register
Date of last modification
Classification scheme
Resource type
Subject headings/keywords

SamWebb (social sciences):
The metadata standard Dublin Core and the following DC elements are used:
Identifier
Title
Publisher
Description
Relation
Rights
Subject
Type
The same eight elements are used in every record.

The Library Web (economics):
Besides the title, sometimes a resource description is included.

5. Which type of resource description is used in the service? A simple annotation, a short description, a short critical evaluation, or an informative summary of content.

Agora:
The resource descriptions vary between each resource, from not having any descriptions at all to short descriptions.

Biogate:
The resource description consists of a simple annotation and keywords.

Diseases, Biomedical, SveMed+ (medicine):
No resource description at all.

EELS:
A short description.

ESSEL (geology and physical geography):
The resource description, here labelled as "contents", varies between the resources. It consists either of simple annotations like "homepage of Museum" or of short

descriptions like: "The Geological Survey of Finland (GTK) is a modern research centre that provides consultancy services and basic geological information essential for assessment of raw materials, nature conservation, environmental studies, construction, land use planning and for new applications, such as medical geology. Providing society with relevant and comprehensive geoscientific information and related data services is also an essential part of GTK's operational activities".

   There is also a great difference in the use of language in the varying descriptions, like spelling and grammar. This might have to do with the fact that some of the resource information is included in the database after suggestion from the users, who fill out and send in a suggestion form. The question arises whether the resource is included in the database without additional editorial assessment. (NOTE: this is a mere assumption on our part and has to be checked out. It may not be so, the resources might be quality assessed by the editorial staff, we will have to ask them.)

NOVAGate (forestry, veterinary, agricultural, food and environmental sciences):
The resource description is of the short-informative-summary-of-content type, but the term short description can be accepted as well.

Library of education and psychology (psychology and education):
None of the above, besides a few short descriptions of some resources from the homepage of the library of the University of Stockholm.

Rättskällan (law):
A simple annotation.

SamWebb (social sciences):
A simple annotation or a short description.

The Library Web (economics):
The resources listed as "links" have a simple annotation, while the resources listed as "databases" have a short description.

Women's History Collections (women's, men's and gender studies):
Varied. Some of the resources have a short description, or a simple annotation, or no description at all and some appear to have an informative summary of content.

6. Is it possible to search or browse or do both within the service? How deep is the browsing structure?

Agora:
Both are possible. The search option is divided into one simple search and one advanced search with several search options, see item 7. The browsing structure is several levels deep.

Biogate:
Both. The user has the possibility to browse onto the next two levels. The search can be conducted in three different ways:

Simple search

Advanced search:
Author
Publisher
Description
Title
Keywords

Cross search with options:
All fields
Title
Author
Keywords
URL

Diseases, Biomedical, SveMed+ (medicine):
On *Diseases, Disorders and Related Topics* site it is possible to conduct a page or
link search. Browsing is also possible, either through a general list of diseases and
disorders or through an alphabetical list of the same. The browsing is possible onto
the two following levels.
The *Biomedical Information Resources & Services - by Subject* site provide the same
browsing structure and a simple search option. *SveMed+* is merely a searchable
service with simple and advanced search options.

EELS:
Yes, both. The search can be conducted with options like all fields, title, URL,
description, subject, EI classification (see item 8).
The browsing structure is several levels deep.

ESSEL (geology and physical geography):
Both are possible. The browsing is possible onto the two following levels, either to
the metadata of the resource or to the resource itself.
The search options are as following:
Subject heading
Publishing country
Language
Type of resource

Women's History Collections (women's, men's and gender studies):
The hyperlinks are compiled according to subject and can be browsed onto the next
level. The only search option that is available on the website is the one where the
user can search through the whole database of the Gothenburg university library.

**NOVAGate (forestry, veterinary, agricultural, food and environmental
sciences):**
Both are. The resources are categorized according to subject categories making it
possible for the user to browse through the subject headings. The classification

structure limits the browsing onto the next level. The search can be limited according to what type of resource is wished for: a database, a directory, an event, an Internet resource guide, training material, an organisation, or an electronic document.

Library of education and psychology (psychology and education):
There is no search option, and the browsing list links directly to the listed resource.

Rättskällan (law):
Both are. The browsing structure is not deep, just onto the next level.

SamWebb (social sciences):
Both are. The browsing is several levels deep.
The service has simple and advanced search with a free-text option. When searching with advanced search you may search on:
Title
Publisher
SAB classification
Subject headings
Geographical area
Type

The Library Web (economics):
It is possible to browse onto the next level, but there is no search option, apart from the possibility to search for journals and the search engines.

7. What type of subject access does the service use: keywords, deeper classification structure, combination of thesaurus and classification?

Agora:
Title
Name/Institution
SAB classification
Subject word
Geographical area
Time period
Resource type
Free-text search

Biogate:
There is no deep classification structure (two levels only), no apparent thesaurus and the terms in the subject tree can be used as keywords when searching.

Diseases, Biomedical, SveMed+ (medicine):
The resources in the database are indexed according to MeSH (Medical Subject Headings) and corresponding keywords in Swedish. When searching, the subject headings can be used as keywords.

EELS:
Subject descriptors from the Engineering Information Thesaurus and a deep and thorough classification structure.

ESSEL (geology and physical geography):
Keywords/subject headings. There is no deep classification structure or thesaurus.

Women's History Collections (women's, men's and gender studies):
Keywords compiled by subject or by geographical area.

NOVAGate (forestry, veterinary, agricultural, food and environmental sciences):
The service uses a classification that is connected to the Agrovoc…, and use subject headings from Agrovoc thesaurus. The service does not seem to use any controlled vocabulary or keywords.

Library of education and psychology (psychology and education):
None.

Rättskällan (law):
Subject headings used as keywords, no classification structure is evident, whether a thesaurus is used or not is not clear.

SamWebb (social sciences):
Not a thesaurus, but the SAB subject headings are used.

The Library Web (economics):
None of the above.

8. What type of classification system does the gateway service use?

Agora:
The SAB classification system.

Biogate:
The service does not use a recognisable classification system, the resources in the service are classified into 11 main subject groups within the field of biology. When clicking on one of the main subjects, a set of terms appears lower down in the hierarchy and the next level shows the resource description.

Diseases, Biomedical, SveMed+ (medicine):
It does not seem to have a classification system.

EELS:
The subject classification scheme from Engineering Information, Inc.

ESSEL (geology and physical geography):
Not evident. Nothing is written in the service that provides any clues as to if and what classification system is used. The subject headings seem thorough and detailed and could belong to some classification system.

Women's History Collections (women's, men's and gender studies):
None.

NOVAGate (forestry, veterinary, agricultural, food and environmental sciences):
Here are the broad subject categories used in browsing the database:
- A. Agriculture in general
- B. Geography and history
- C. Education, extension, information
- D. Administration and legislation
- E. Economics, development, rural sociology, consumer policy
- F. Plant science and production, horticulture
- H. Plant protection
- J. Handling, transport, storage, protection
- K. Forestry
- L. Animal science, production and protection, veterinary medicine
- M. Fisheries and aquaculture
- N. Agricultural machinery and engineering
- P. Natural resources and environment, landscape planning
- Q. Food science, processing of agricultural products, food and feed hygiene
- S. Human nutrition
- T. Pollution
- U. Methodology
- X. Natural sciences

Library of education and psychology (psychology and education):
None.

Rättskällan (law):
The SAB classification system.

SamWebb (social sciences):
The SAB classification system.

The Library Web (economics):
None.

9. Does the service include any value-added features?

Agora:

Yes it does, for example: "what's new" with announcements about upcoming events in Sweden and also a service called "new links", where the latest links are displayed.

Biogate:
Yes, it includes a detailed "help" service, with an explanatory guide on how to improve the searching skills.

Diseases, Biomedical, SveMed+ (medicine):
Yes, like the "ask the doctor & second opinion services" and medical information in Swedish that is found among the diseases and disorders list on the *Diseases, Disorders and Related Topics* site.

EELS:
Yes, namely a robot-generated subject index called "All Engineering resources on the Internet" that searches full text engineering pages on the Internet.

ESSEL (geology and physical geography):
No.

Women's History Collections (women's, men's and gender studies):
No.

NOVAGate (forestry, veterinary, agricultural, food and environmental sciences):
No.

Library of education and psychology (psychology and education):
"Hjälphyllan", a service that provides access to free reference related resources on the web.

Rättskällan (law):
A service called the "tool box", which includes valuable tips on links, addresses, vocabularies, etc., useful both for librarians and lawyers.

SamWebb (social sciences):
Yes, a possibility to search for "classics", i.e. classical authors in the field of social sciences.

The Library Web (economics):
Yes, the possibility to search the Alltheweb, AltaVista, Northern Light and Adobe PDF Online.

10. What language is used within the service?

Agora:
Both Swedish and English.

Biogate:
Both English and Swedish.

Diseases, Biomedical, SveMed+ (medicine):
English within the first two services, Swedish in *SveMed+*.

EELS:
English.

ESSEL (geology and physical geography):
English in general and Swedish in some resources.

Women's History Collections (women's, men's and gender studies):
Swedish, an English version of the contents of the website is available.

NOVAGate (forestry, veterinary, agricultural, food and environmental sciences):
English, but the resources are described with subject descriptors in English and one of the Nordic languages.

Library of education and psychology (psychology and education):
Swedish.

Rättskällan (law):
Swedish. The subject headings can also be browsed in English.

SamWebb (social sciences):
The main language within the service is Swedish, but the resource descriptions are in English. To a non-Swedish speaking person, doesn't seem a bit confusing?

The Library Web (economics):
English.

11. Comments.

Agora:
The service also provides one alternative subject access, namely different categories, among which some are presented here:
Gateways and search tools
Bibliographies, article indexes and bibliographic databases
Library catalogues and books in print
E-books, e-texts and full text archives
Discussion groups, addresses and personal networks
Manuscripts
Encyclopaedias and reference materials
Education, research and teaching

The categories are clearly presented under each subject and it is easy for the user to find the category he/she is looking for through clicking on that category in the index.

Biogate:
There is one discrepancy; when searching in the field/box "author" for a specific author there are no matches but when searching for the same author in the field/box "any" the author's name comes up. The strange thing is that there is no author metadata field visible or in the source code. The question is, is it possible to make a field in a link searchable without making it a metadata element? This sounds like a technical question, but it may be worth checking out.

The service also provides one alternative subject access, namely different categories, among which the following are presented here:
Articles, papers, reports, abstracts
Homepages
Image collections
Software
Textbooks, monographs
Databases
For example, if the user is looking for abstracts in a specific subject, there is a possibility to go directly to "abstracts" instead of conducting a search in all categories.

An unaccustomed user may have difficulties to find the categories since they are not clearly stated other than in the hierarchical tree.

Diseases, Biomedical, SveMed+ (medicine):
The three sites are located on various places at the homepage of the library of the Karoliska Institute and the user might have difficulties finding these specific sites. The *Disorders and Related Topics* site and the *Biomedical Information Resources & Services - by Subject* site are located under the "Resource" heading, under "Diseases & Disorders" and "Biomedical Links". The *SveMed+* database is also located under the "Resource" heading, under "Medline & Databases", but a search for the database must be carried out in the "database list". This is an obstructive and confusing way of providing access to the resources.
NOTE: To compile by subject – is that a sort of quality selection?

EELS:
The service also provides one alternative subject access, namely through different categories of the resources, among which some are presented here:
Bibliography
Electronic journal
Organisational home page
Bibliographic database
Directory
Unspecified
They are included in the hierarchical tree and the user may browse through them and find the category he/she is looking for.

The users have the possibility to suggest websites for inclusion in the gateway.

Another observation is that the classification tree is difficult to comprehend if the user is not totally familiar with the subject headings.

One inconsistency that might obstruct the subject access is that the detailed metadata of a resource is not displayed with the resource description. Instead the user must click on one of the keywords in the descriptor field where the following is displayed: the title of the resource, a short description and a hyperlink called "details". By clicking on the "details" the detailed metadata is finally displayed. It would save time to display the metadata on the same level as the resource description.

ESSEL (geology and physical geography):
-

Women's History Collections (women's, men's and gender studies):
The only search option that exists on the site is the one that searches through the database of the whole of the Gothenburg library, see item 6. But the "index", which is placed next to the "search" button, is an index of the Women's History Collection, not the Gothenburg university library. This is, in other words, confusing for the user and since it takes a while before this inconsistency becomes evident, it is time-consuming. When searching while using the English version the "news" and the "search" buttons are not even possible to click at, since a message appears declaring: "There is a possible security hazard here…when you download a file from the network, you should be aware of security considerations. A file containing malicious programming instructions could damage or otherwise compromise the contents of your computer." The news and search buttons function in the Swedish version. (Last checked on the January 8th, 2002.)

NOVAGate (forestry, veterinary, agricultural, food and environmental sciences):
-

Library of education and psychology (psychology and education):
This service has no structure.

Rättskällan (law):
The users may suggest websites for inclusion in the gateway.
There is a different amount of results when searching and browsing on the same subject heading or keywords.

SamWeb (social sciences):
-

The Library Web (economics):
Some of the resources listed under "databases" are also found under "links".
There is no explanation as to why they have divided the resources under these two headings.
Several links are broken, last checked on 14th of January 2002.

6. Discussion

The aim with this discussion is to debate some quality issues that according to us are important to resolve in order to improve the quality of Swedish gateway services.

   We discuss definitions of gateway services and quality aspects such as resource quality and selection criteria. We also discuss the functionality of gateway services based on standards and policies, aims and target groups. We look into general views on gateway services and discuss differences and similarities between QCSGs and services such as scientific journals and publishing service that have similar aims as QSCGs which is to provide users with qualitative information.

   Finally we present some aspects that we found in the international section and that in our view the Swedish gateway services should implement. By this we believe that we answer the questions stated in our purpose.

6.1. Definitions of different gateway services

The concept of what we call a "gateway service" is surrounded by confusion. Different terms are used when describing one similar type of service; similar terms like portals, gateways, subject gateways, information gateways or hubs are used in the same context but do not necessarily mean the same thing. There are unclear and different definitions of what exactly a subject gateway or a QCSG is. It is also difficult to know the difference between these services. Not only because of the usage of so many terms but also because the boundaries between them are vague. To some extent, Koch offers a solution to this confusion. As stated in the literature study, he defines two different types of services: a subject gateway and a QCSG. These services share three properties, namely these services are

1. gateways that provide access to online information resources,
2. subject based, and
3. quality controlled by a subject and/or information specialist.

Item one above intends services that gather online resources under one common user interface. Item two means gateways that collect resources from one common discipline. Item three means that some human intervention must be used to assure the quality of resources. On the other hand the main distinction between a subject gateway and a QCSG lies in the degree of human intervention during the resource selection process.

6.2. Quality control of resources in gateway services

One of the special features of a gateway service is the human intervention in the resource selection process. By human intervention we mean that either a subject and/or an information specialist is involved in the selection process of the resources in accordance with preset quality measures such as quality criteria. One could claim that the process of manual resource selection and application of metadata implies that the service is more likely able to guarantee resources of a higher quality level. The literature study shows that leading information specialists (Koch, Hofman, Worsfold) do not believe that present methods for automated selection of resources is

adequate to secure high quality resources in a gateway service. Manual selection is necessary.

We do not believe that manual selection is enough to guarantee that only high quality resources are selected though. The reason is that it is not always clear how a subject specialist should manually select the resources. What is included in the process of manual selection must be considered as for example staff competence and what types of selection criteria are applied. This type of selection process is not always the case today.

We define *quality resources* in an academic gateway service as resources of *generally approved scientific accuracy and reliability*. We do not believe that it is possible to claim that resources in Swedish gateway services are of guaranteed high quality in general. As mentioned above, the Swedish gateway services may roughly be divided into two different types: QCSG and subject gateways. The category subject gateways is composed of a variety of services, for instance link lists. One person, either a librarian or a subject specialist, usually manages the link lists, while QCSGs are usually managed by a team of librarians, subject or information specialists. Koch states that it is hard to imagine that quality features that are offered in a QCSG could be offered in a sustainable way by a single individual managing a link list.[110] With "quality features" we believe Koch means the seven defining elements of a QCSQ (see the literature study). Of the Swedish gateway services we considered, we define four of the subject gateways as link lists. One of these services called *Diseases, Disorders and related topics* state in a disclaimer that it is up to the users to critically assess the quality and usefulness of the information offered through the service.[111] This example shows that link lists cannot guarantee quality resources and since link lists are included in the subject gateway category, we conclude that subject gateways cannot always guarantee high quality resources. This does not necessarily mean that link lists or subject gateways cannot offer high quality resources at all.

What is the situation in the case of QCSGs? Can this type of service guarantee high quality resources? According to Koch's definition, QSCGs apply a rich set of quality measures which support systematic resource discovery and considerable manual effort takes place in order to secure the only that high quality resources are selected. We find that although substantial effort is made to secure only high quality resources, it is still not evident that resources in QCSGs really are of high quality. By substantial effort we mean the use of collection development and management policies that include metadata standards, selection criteria standards, classification systems, etc.

The reason as to why we find that these efforts do not secure high quality resources is that, for example, metadata standards do not have an impact on how quality resources are selected. Even though selection criteria must be seen as an important part of the whole quality control process, we believe that at present it is not enough to ensure quality resources. In spite the existence of the DESIRE selection criteria, there is no selection criteria standard that is generally applied.

So far we have not been able to find any QCSGs that are able to guarantee that all their resources are of generally approved scientific accuracy and reliability. The question is will this ever be possible? If the gateway services are managed in the future as they are today the answer is likely to be no. However the services are

---

[110] Koch Traugott, 2000, p 26.
[111]Accessible via http://www.mic.ki.se/Diseases/Disclaim.html [last checked 15/2-2003]

constantly evolving according to user needs and preferences and user demands for gateway services with guaranteed high quality resources might change the services in that direction. If the Swedish gateway services should develop in this direction, we believe that they need to take a stand on the questions raised here.

A unique side of a gateway service is that it provides access to online resources that consists of one home page that links to numerous other pages. This means that the user has the possibility to go deeper into the structure and find other information. This generates a problem concerning quality assessment, because does the assessment only include the page that the gateway service provides direct access to or does it include the whole website?

6.3. Resource selection criteria

Five of the Swedish gateway services publish their selection criteria on their websites while six do not. Does this indicate that six services do not find selection criteria important enough to be published? We believe that it is rather a matter of these websites being unaware of what is relevant information for the users. It might also be a case of being unaware of the importance of a functioning and formal selection policy for the gateway services. According to the DESIRE project, there are a number of advantages in developing a formal selection policy for a gateway service:

- it helps users to appreciate that the service is selective and quality controlled
- it helps users to understand the level of quality of information they will find when using the service
- it helps gateway staff to be consistent in their selection and to maintain the quality of the collection
- it can be used to train new staff
- it ensures consistency in collections that are developed by a distributed team[112]

This is something we believe the Swedish gateway services should take into consideration and elaborate further. Not only because, as stated, a policy would be useful to the staff in the process of managing the services but also because it provides important information to the users.

The issue of quality selection criteria is not much debated in the Swedish information science community. A first step towards a selection policy is a discussion concerning quality selection criteria. The next step would be to define and acknowledge a policy that eventually could be implemented. Preferably the ultimate goal would be to apply a system that guarantees that subject specialists select resources according to a defined policy and that the quality selection criteria would be publicly stated on the websites of each service. If a service does not apply any quality selection criteria, that should also be publicly stated, just as seen with the example of the *Diseases, Disorders and related topics* website.

As we saw in chapter four, the quality criteria of the Swedish gateway services are rather unclear.

First the issue of applying selection criteria or not and whether that is published or not: six of the services do not publicly state if they apply any selection criteria. It is most likely that some of the services apply some criteria. But if that information is

---

[112] Accessible via http://www.desire.org/handbook/2-1.html [last checked 16/2-2003]

not published on the website of the services how will the users know that criteria are applied? What is the point of applying criteria if the users cannot obtain that information?

Second the issue of what type of criteria is applied: five of the services provide public information about their criteria, but the criteria differ between each service. One of the five applies the whole DESIRE criteria, another applies parts of the criteria and three apply own criteria without stating if these criteria are based on some standard or not.

We are not suggesting that the complete application of the DESIRE selection criteria is necessary. We believe they should be seen as suggestions and inspiration to the gateway producers as it is done for example in Australia. The complete DESIRE criteria list is very detailed and would almost be impossible for the Swedish gateway services to apply fully. But it is important to strive towards a consensus concerning quality criteria. On the whole it is our concern that quality selection criteria are not in focus in the Swedish gateway services. As we saw in the literature study, BIBSAM is unclear when it comes to this issue. On one hand they suggest that the selection criteria should be the responsibility of each gateway service and on the other that a working group should look into this issue. It is also unclear if the working group should consist of BIBSAM representatives and/or gateway service representatives. Nothing is clearly decided about how to approach the selection criteria issue. BIBSAM only suggest technical improvements and changes.

Of course the economic and technical aspects are also very important when discussing the quality of gateway services. The financial situation is most likely one of the main reasons why many gateway services cannot sustain any long-term and qualitative operations. It is possible that the cost of adopting standards for example selection criteria standards used by international gateway services might at the present seem huge both for BIBSAM and the national resource libraries. In the long run though, the adaptation of international standards might turn out to be a cost efficient investment. As it seems organisational changes are due if the BIBSAM database proposal will come through.

But it is not our purpose to discuss the financial or technical issues of the Swedish gateway services, instead we want to elaborate further the resource quality issues within these services.

6.4. The issue of common standards and guidelines

It is important to remember that the eleven gateway services in Sweden vary in type, financial conditions, interface, and technical solutions. What they share in common is that the academic community is their most important target group and that they are non commercial gateway services managed by libraries, that they are subject based and generally have the same aims, which is to provide access to qualitative online information resources.

The reason that the services are varied is that they have expanded during the last couple of years and are constantly evolving in content and design. Another reason is that up to now Sweden has applied a somewhat decentralised approach and the national resource libraries were free to develop their own gateway services. Each national resource library developed their own gateway services drawing from their own experience, knowledge and possibilities. Consequently the gateway services are run without hardly any common or coherent guidelines.

There is in other words little co-ordination with regards to content, design, technical issues, or quality criteria aspects and the outcome of the gateway services varies immensely. It is difficult to work towards a more unified national gateway service with the lack of a strong organiser. In some questions we perceive a compliant attitude from BIBSAM towards the national resource libraries. It is also not certain that BIBSAM will continue to act as a central co-ordinator for the future Swedish gateway services.

We do not suggest that BIBSAM should have that co-ordinating role but if anyone should BIBSAM is a natural choice since it has a lot of experience and knowledge on this subject. The BIBSAM proposal of a joint database for the Swedish gateway services is a step towards joint technical co-operation between the gateway services but the proposal only occasionally mentions quality issues or international co-operation.

We believe that standards concerning quality selection criteria are just as necessary as standards for metadata, interface, and technical solutions.

6.5. Aims and target groups

Our evaluation showed that five out of eleven of the Swedish gateway services do not provide any publicly stated aims or target groups at their website. By aims we mean the purpose of the service and by target groups we mean the end users that are intended to use the service. To publicly state the aims of the service is a way of defining the purpose of the service and is also helpful to the users because without this information it is difficult for the users to know whether the service can provide any relevant information to them.

The aims that are publicly stated by five of the Swedish gateway services are quite varied. As an example, the aims of the gateway service called Agora are to obtain and provide access to national and international quality resources within the field of humanities and to co-ordinate and rationalise the work that is simultaneously conducted at different institutions.[113]

Would it not be more efficient and realistic if Agora limited the aims only to include online resources within the humanities subject area that are produced in Sweden? As mentioned earlier this limitation is applied in Australia and Norway. It would limit duplication of time and effort because international online resources within humanities are collected elsewhere. It would also help the service to focus and specialise on its subject area. Instead of going through the whole administration process of selecting and evaluating international resources why not link to international gateway services within the same subject area. We believe that the Swedish services would save both time and effort focusing on limited subjects or on Swedish produced resources. Collaboration with international gateway services could also mean that the international services could link to Swedish gateway services and thus provide access to Swedish resources without having to go through the whole selection process.

The Agora target group is "researchers, students, teachers and librarians within the Swedish academic community, as well as the international academic community and everyone with a specific interest in the subject field covered by the service".[114] In other words the Agora target group is very broad and so are the aims. Is it really possible for one gateway to, with retained quality, obtain and provide access to both

---

[113] Accessible via http://agora.ub.uu.se/presentation.cfm [last checked 22/9-2002]
[114] Accessible via http://agora.ub.uu.se/eng/presentation.cfm [last checked 22/9-2002]

national and international quality resources within this huge field at the same time as serving such a broad target group? Would it not be more efficient to focus on the Swedish academia as a target group? We believe it would increase the chance of satisfying the target group needs. Also instead of having huge aims that are not reasonable to accomplish the aims should be narrowed down in order to fulfil them.

As we saw in the literature study, the user survey showed that users are not fully satisfied with the level of quality of the resources in gateway services and that certain subject areas were not covered well enough. In other words why not concentrate on quality prior to quantity?

If gateway services cannot guarantee access to quality resources then it is important to state this publicly, as for example on the *Diseases, Disorders and Related Topics* website.

We believe that the aims must follow the needs and wishes of the target group. This leads further to the question: what is quality according to the users? As we see it, one of the most important quality aspects of gateway services must be to offer relevant information to the users. If a gateway service has an academic target group, then it is very likely that when users request relevant information this will be equivalent to scientific information.

However, students, scientist and teachers might need different level of scholarly information. For example, students need instructive and pedagogic information, whereas scientists need current research. At the present the target groups of the Swedish gateway services are quite varied. They consist of students, postgraduates, researchers and teachers, etc. A possible scenario for gateway services in the future would be to focus on smaller target group categories. This could become necessary if the amount of resources continues to increase on the Internet. Limiting the target group would be a way of increasing the quality within the services. If the gateway services do not want to limit the target group, another way to facilitate the end users could be to apply information in the metadata about scholarly type, i.e. student material, teacher material and current research. If this information was added in the metadata it would be possible for the users to limit the search to the scholarly type of information they wish to obtain.

6.6. Views on the Swedish gateway services

The eleven Swedish gateway services are undergoing change. They have developed during the last years and, according to BIBSAM, they have been a BIBSAM priority. All but one of the services are currently in operation. EELS was recently closed down.

As mentioned earlier, BIBSAM proposes co-ordination of the gateway services, as we understand it, partly due to financial aspects. The proposed changes are interesting and necessary but not enough in our view.

Another view on the gateway services that needs to be taken into consideration is the view of the national resource libraries that manage the gateway services. For example it is important to examine the opinion of the staff working with the services, something that as far as we can see has not been done. How do they perceive the services? Are the services seen as a mere extension of the actual library or are they seen as independent services that should be developed based on their own conditions and possibilities? And what is the libraries' purpose with the services? How does the staff look on the issue of resource quality and selection criteria? Is there a chance that

the staff applies the same selection criteria that are applied on the material in the library (paper or online) and if so is that right or wrong?

We do not believe that the gateway services should be seen as part of the actual library. It is not advisable to apply same selection criteria when selecting online resources in gateway services as when selecting printed resources in a library. The reason why we do not believe in the use of the same selection criteria is that selection of typical library material in university libraries is often related to what the students need as course material.

There is another difference between typical library material and gateway resources. Most of the printed material has already undergone a first quality control, i.e. through peer review or editorial control before it is included in the library collection while the online resources in gateway service have not undergone that first quality control before they are assessed by the gateway staff. The library material has already undergone a quality assessment, which the online information resources have not.

Another issue concerning the Swedish gateway services that needs to be discussed is if the services have an international approach, first and foremost concerning the issue of quality. We have not found many tendencies that suggest that the Swedish gateway services are internationally competitive. EELS, one of the services that was internationally renowned amongst information specialists, was recently closed. The decision to close down EELS indicates that international aspects were not taken into consideration. There is not much that indicates that the other Swedish gateway services have an international public and so we cannot assume that this is the case. Nonetheless this needs to be examined.

When it comes to applying policies regarding quality issues in general and selection criteria in particular, the Swedish gateway services are not fully developed. More has to be done; a joint national initiative and co-operation concerning quality issues and selection criteria is essential. To improve on these issues, the services could join an international collaboration as another step towards better and user-friendly services.

6.7. Differences and similarities between QCSGs, scientific journals and publishing services

During our work with quality issues and QCSGs we considered whether or not it is possible to compare QCSGs with scientific journals, or publishing services like BioMed Central. What, if anything, do QCSGs, scientific journals, and BioMed Central have in common?

Maybe it is not justifiable to make comparisons between QCSGs, scientific journals, and publishing services. However we feel that the comparison is interesting since we believe it might be productive for the discussion about QCSGs. The services would benefit if they were analysed from another perspective.

QCSGs and scientific journals have the same overall aim which is to serve the academic community with reliable scientific information. In a way one could also claim that they have the similar organisational structure. By this we mean that QCSGs provide online information in a similar way as scientific journals provide printed information; the gateway staff are comparable to journal editors and resources in QCSGs are comparable to journal articles. Not even the electronic format sets them apart since e-journals are becoming more and more common.

Two things that QCSGs and BioMed Central have in common are that both provide access to online resources for the academic community and that the resources are

free of charge to the users.

What distinguishes QCSGs from scientific journals or BioMed Central? One major difference is that a QCSG is a service that provides access to online resources but does not hold the actual resources itself. Instead it provides a document surrogate with a resource description, while e-journals or BioMed Central hold the material in own databases. Another difference is that the content of the resources that QCSGs access might change without the knowledge of the staff of the service if they do not regularly checked and updated the links. The content of the material in e-journals or BioMed Central cannot change once they are included in the service, only if the material is withdrawn. A third difference is that in some scientific journals authors have to pay a publication fee.

What is the point of comparing QCSGs with scientific journals and BioMed Central? We believe that a discussion about how to develop and improve the Swedish gateway services would benefit from an investigation of how other services similar to gateway services apply quality criteria.

6.8. Scientific journals and quality control

Scientific journals are today one of the most important sources of scientific information to scientists within many subject areas. To secure the quality and maintain or improve the scientific level of the produced material is therefore essential. As stated in the literature study, the peer review system enables quality control and the core of the peer review system is that subject specialists review scientific material produced by other scientists.

There are two essential reasons to why the scientific journals play such an important part in the distribution of scientific information. The first reason is the structure allowing fast distribution of the latest results. The second is the peer review system.

If all Swedish gateway services applied quality selection criteria, would that be sufficient to secure the resource quality? Or is an additional system required as for example the peer review system? Maybe it is not possible to apply a peer review system in gateway services but it is an interesting idea worth investigating. As we saw in the literature study the lack of an editorial function, or reviewing of online resources, is also identified as one of the main problems by the users of gateway services.

We think it could be possible to apply a peer review system in gateway services and especially in QCSGs but there are obstacles that need to be considered first. In order to apply the system, the gateway services need to follow functioning and well-organised routines. A positive publicity is also important in order to find the subject specialist who would conduct the reviews. Other problem would be the financial aspect. Referees are generally unpaid and, if this were the case in gateway services, this would not overwhelmingly increase the cost, otherwise it is difficult to imagine the implementation of the peer review system.

Have there been, so far, any attempts to use the peer review system in gateway services? Not that we have found but some of the QCSGs that participate in the Renardus service try to get subject specialists to peer review the resources.

We believe it is very important to emphasise the quality issue, selection criteria, and resource quality. Why? Because, as seen in the user surveys, the users call for more qualitative resources in gateway services, even in such high qualitative services as QCSGs. What has been done so far has not been enough, the services are

continuously evolving, though battling with problems and this is one way of improving the quality of service.

Maybe gateway services and especially QCSGs would become as influential in covering online information resources in the future as scientific journals are today in covering scientific material. In that case it would also be possible that QCSGs could do the pioneering work of covering those subject areas that now do not have sufficient online coverage.

6.9. What can Sweden learn from international gateway services?

When we compare the Swedish gateway services with international services there are several aspects that stand out as interesting and that we believe the Swedish services should look into because these aspects facilitate and enable the services to organise and conduct their work.

First we believe that the Swedish gateway services should be managed on a more centralised level than they are today, as is already done in Australia and Norway, Denmark and to a certain extent also in the United Kingdom. The reason is that at the present the Swedish services differ in type, financial conditions, and interface, as well as in technical solutions and we see this as a problem.

Second, that some countries gather first and foremost national resources in their gateway services instead of gathering international resources. As said earlier, if applied by the Swedish services this would limit duplication of effort. Another aspect of this national approach is that in the future all these gateway services could provide access to their national resources through one giant gateway service or a broker. There are still many small services that are scattered around in different countries, struggling with their own problems and too busy to focus on the aspect of globalisation but perhaps one day this idea of a world wide service could become a reality. Some of the already existing projects abroad strive to provide access to as many users as possible irrespective of nationality. The Renardus project is one of them.

Third, the Swedish gateway services should emphasise the importance of selection criteria. We believe that RDN is a good example of a service emphasising the importance of selection criteria. They state that the information about selection criteria **must** be available on the websites of the gateway services. As we have seen not only in the Swedish gateway services but also international ones, the services do not always understand the importance of publicly stated criteria.

Fourth, many of the countries acknowledge the necessity to keep an open mind when it comes to implementing technologies, standards and guidelines. Collaboration amongst them is not unusual. We encourage the Swedish services to take part in the international collaboration on a higher extent.

Fifth, another interesting point is the difference in views on the importance of gateway services in Sweden and Denmark. The Danish government invested during a two year period (1998 - 2002) approximately 200 million DKK while the BIBSAM invested during a four year period (1997 - 2001) only eight million SEK. (The difference between those two currencies is very small.)[115]

In conclusion we believe that the Swedish gateway services should work together to solve the most necessary issues and create a national service that will have common

---

[115] 100 SEK are 80,04 DKK [last checked 29/5-03]

policies concerning quality control, technology, user friendliness, etc. We also hope that this national service eventually will be part of a more global context. This we believe is necessary for the ultimate survival of the gateway services.

7. Summary

The purpose of this master thesis was to discuss some quality issues that are important to resolve in order to improve the quality of existing Swedish gateway services. In addition, we sought to find a definition of gateway services.

We examined different terms and definitions of services which we gave the collective term gateway services. A gateway service is a type of subject based service that provides access to online information resources which may be quality controlled by a subject or information specialist. We found that there is some confusion concerning definitions of different gateway services even amongst specialists. Different terms are used to describe one type of service or the same terms are used to describe different services.

We presented Koch's definitions for QCSG and subject gateways respectively. Koch's definitions are rapidly gaining acceptance in the European information science community.

The role of BIBSAM and the Swedish national resource libraries as producers and caretakers of the gateway services was presented. We looked into how other countries have structured and developed their gateway services and we presented user opinions from an international user survey.

Then we presented data we gathered concerning the Swedish gateway services based on three questions: what type of service they provide, what are their aims, and what quality criteria they apply. The complete survey was presented in the next chapter.

In chapter 6 we discussed quality issues in gateway services with emphasis on resource quality and selection criteria. Then we investigated the functionality of gateway services based on their standards and policies, their aims, and their target groups. We compared these services with other academic services such as scientific journals and publishing services which ultimately have a similar purpose as the gateway services, namely, to provide qualitative scientific information. We also debated the view that QCSGs could apply the same quality control system as scientific journals, that is, the peer review system. Finally we suggested some improvements based on observations of international gateway services.

We concluded that one of the most important quality aspects of a gateway service must be to offer qualitative and relevant information to the users. One way of doing this is by implementing necessary policies concerning quality issues, such as quality selection criteria, and then to publicly state the aims of the service. Our idea was to look at how other countries have implemented policies and standards. Another idea of ours was that the Swedish gateway services should only gather national resources instead of both international and national resources as they do today. A third idea was to collate the gateway services in a national collaboration. Such collaboration could resolve many important issues and create a national Swedish gateway service that could become internationally competitive.

References

ADAM, accessible via http://www.adam.ac.uk

AgNIC, Agricultural Network Information Center accessible via
http://www.agnic.org

Agricultural Biotechnology, accessible via http://agnic.umd.edu/

AGORA, accessible via http://Agora.ub.uu.se/presentation.cfm

AGRIGATE selection criteria, accessible via
http://www.agrigate.edu.au/selection.html

American psychological association, *Publication manual of the American psychological association*, 5 ed. 2001, Washington DC

Becker Hans J., Klaproth Frank, Lepschy Petra, *Survey of end user surveys*, 2000, p. 1-21, accessible via http://www.renardus.org Home > About Us > Project Archive > Project Deliverables [last checked 1/2-2003]

Best practice checklist for Australian subject gateways, accessible via
http://www.nla.gov.au/initiatives/bestpractice.html

Bibsys, accessible via http://www.bibsys.no/om/bibsys-status-e.htm

BioMed Central, accessible via http://www.biomedcentral.com

Definitions for Web-based services, a set of working definitions for Web-based services linking to high quality, reviewed resources for researchers and other interested parties, as endorsed by the Australian Subject Gateway Forum at the ASGF meeting on 23rd February 2001, accessible via
http://www.nla.gov.au/initiatives/sg/servicetypes.html

DEF project, accessible via http://www.deflink.dk/eng/default.asp

Dempsey Lorcan, The subject gateway: experiences and issues based on the emergence of the Resource Discovery Network, *Online Information Review*, 24(1), 2000, p. 8-23.

DESIRE project, accessible via http://www.desire.org/

DESIRE handbook, accessible via http://www.desire.org/handbook/2-1.html

DESIRE quality criteria, accessible via
http://www.sosig.ac.uk/desire/qindex.html

Diseases, Disorders and related topics and Biomedical information resources &
services – by subject, accessible via
http://www.mic.ki.se/Diseases/Disclaim.html

Dublin Core metadata standard, accessible via http://www.dublincore.org

EELS, accessible via http://eels.lub.lu.se/

Karin Ericsson Lagerås, Vetenskaplig publicering i gungning, BIVIL:s
skriftserie 2003:7, p. 1-46. Examensarbete (20 poäng) för magisterexamen i
Biblioteks- och informationsvetenskap vid Lunds universitet.

Harnad Stephen, The invisible hand of peer review. *Exploit interactive*, 5,
1999, accessible via http://www.exploit-lib.org/issue5/peer-review/

Hickey Thomas B., CORC: a system for gateway creation, *Online Information
Review*, 24(1), 2000, p. 49-56.

Hoffman Paul, Worsfold Emma, Specification for resource description
methods Part 2: Selection criteria for quality controlled subject gateways,
DESIRE – Development of a European service for information on research and
education, 1996, p 1-88.

Hovdhaugen Even, Informasjonskompetanse for studenter – hvorfor og
hvordan, *Synopsis*, 6, 2000, p. 337-342.

Huxley Lesly, Renardus: Follow the Fox!, *Cultivate Interactive*, 1, 2000,
accessible via http://www.cultivate-int.org/issue1/renardus/

Huxley Lesly, Renardus: fostering collaboration between academic subject
gateways in Europe, *Online Information Review*, 25(2) 2001, p. 121-127.

IMesh Toolkit project, accessible via http://www.imesh.org/toolkit/

Jennings Simon, *RDN Collections Development Framework*, Version 1.2,
2002, p 1-6, accessible via
http://rdn.ac.uk/publications/collections/cdframework3.doc

Klondiras Inger, *Kvalitetsbedömda informationsresurser på Internet/WWW*.
Accessible via http://www.kb.se/bibsam/ansvbibl/gateways.htm

Koch Traugott, Quality-controlled subject gateways: definitions, typologies,
empirical overview, *Online Information Review*, 24 (1), 2000, p 24-34.

Kungliga Biblioteket, (the Royal library), accessible via
http://www.kb.se/BIBSAM/english/nrl/libraries.htm

Missingham Roxanne, Portals down under, *Econtent*, 23(2) 2000, p 40-47.

National library of Australia, *Definitions for Web-based services*, accessible via http://www.nla.gov.au/initiatives/sg/servicestypes.html

NOVAGate, accessible via http://novagate.nova-university.org/nova.html

OCLC (Online computer library center), accessible via www.oclc.org

Place Emma, *International collaboration on Internet subject gateways*, from the 65th IFLA Council and General Conference, Bangkok, Thailand August 20 – 28, 1999, accessible via http://www.ifla.org/IV/ifla65/papers/009-143e.htm

Price Adrian, Five new Danish subject gateways under development, *Online information review*, 24(1), 2000, p. 69-73.

RDN, accessible via http://rdn.ac.uk/about/history/

Renardus service, accessible via http://www.renardus.org

Roads project, accessible via http://www.ilrt.bris.ac.uk/roads/

Robinson Lyn, Bawden David, Internet subject gateways, *International Journal of Information Management,* 19(6), 1999, p. 511-522.

van Rooyen Susan, Black Nick, Godlee Fiona, Development of the Review Quality Instrument (RQI) for Assessing Peer Reviews of Manuscripts, *J Clin Epidemiol* 52 (7), 1999, p. 625-629.

Rowland Fytton, The peer review process, *Learned Publishing*, 15, 2002, p. 247-58.

Rowley Jennifer, Farrow John, *Organizing knowledge. An Introduction to Managing Access to Information*, London, 2000, p. 404.

Rättskällan, accessible via http://www.sub.su.se/rattskallan/om.asp

SamWebb, accessible via http://www.ub.gu.se/samwebb/about.html

Signpost project, accessible via http://scout.wisc.edu/addserv/signpost/index.html

Åslund Henrik, Friberg Tomas, *Samordning av ansvarsbibliotekens ämnesportaler. Grov teknisk kravspecifikation*, 13/5-2002, p. 1-24. Accessible via http://www.kb.se/bibsam/utredn/amnesportaler.pdf

Appendix 1. Comments to the survey questions

This appendix presents comments to the ten questions that our survey is based on.
These comments explain why we choose to investigate these specific issues.

1. Defining the service, is it a subject gateway or a QCSG?

The eleven gateway services provide a variety of different services. The functionality
of these services and what they provide to the users was unclear to us. That is the
reason as to why we needed to categorise them. To apply the Traugott Koch's
categorisation of the services, i.e. a) subject gateway and b)QCSG, felt applicable.[122]

It is also important to understand the service's present qualifications and
possibilities in order to see the future ones. We wanted to find out whether the staff
publicly proclaimed a definition of the service. If a service is defined as a subject
gateway or a QCSG by its staff, it is also interesting to see if the service fulfils this
definition. It indicates if there is an intellectual effort behind the work process and
also if it is comprehensible for the user what the service stands for and what it
provides.

The question as to how to define the different services that we cohesively call
gateway services is one of the major issues in this thesis. Again and again have
we redefined and reassessed their concepts. Finally we concluded that it is not
a simple task to distinct them from each other since the boundaries of each
term are often entangled with each other. We concluded that the difference
between a subject gateway and a QCSG lies in the level of appliance of quality
control, since the high quality control is a "trade mark" of the latter. As
mentioned earlier, a subject gateway does not include the high quality services
provided in a QCSG.

2. Does the service publicly account for its aims and target groups on the website?

There is a reason as to why these services have been created and the need of overall
aims of the service is quite essential. By aims we mean the purpose of the service. By
target group we mean the group of end users that the service is focusing on. The
question is not "if" there are any aims, but are they publicly stated and if so "what"
do they state and "how" are they accounted for. The aims should be publicly stated
for the benefit of the users.

3. Does the service publicly account for its aims on the website?

With quality selection criteria we mean the criteria that can be used to assess
and control the quality of the web resource. There are many aspects that an
editorial staff can take into consideration when collecting web resources, e.g. is
the resource subject relevant, up to date and reliable, valid, etc. The selection
process involves that the resources are harvested, gathered, selected and
classified by subject, each resource is manually controlled and evaluated
according to certain criteria. For an inclusion in a gateway service the resource

---

[122] See Traugott Koch on pages 8 -10.

must fulfill the set of selection criteria that the editorial staff has compiled.

It is important to publicly state what type of quality control and what selection criteria are applied within the service, for the benefit of the users. The DESIRE project states that:

> There are a number of advantages in developing a formal selection policy for a gateway and publishing it on your site:
> - it helps users to appreciate that the service is selective and quality controlled
> - it helps users to understand the level of quality of information they will find when using the service
> - it helps gateway staff to be consistent in their selection and to maintain the quality of the collection
> - it can be used to train new staff
> - it ensures consistency in collections that are developed by a distributed team[123]

The following questions (4 - 8) investigate the different approaches of retrieving information.

4. What type of metadata is used to identify the electronic documents?

As stated above it is important that an online information service provides information about what it has to offer. Also information about what type of metadata or metadata standard, metadata elements are used and what the purpose of metadata is, namely to be a document surrogate, should be included. Metadata can be very useful to the user if he or she is familiar with their existence and understands their purpose. While searching for information on a particular subject, instead of undertaking the time-consuming effort of viewing each resource, the user can view the metadata and decide which of the resources are interesting enough to have a look at.

5. Which type of resource description is used in the service? A simple annotation, a short description, a short critical evaluation, or an informative summary of content?

Here we analyse one of the specific metadata elements, namely the resource description. The resource description provides brief information of the content of the resource. It is in other words comparable to an abstract of an article. It is significant that the service provides an informative resource description. If the description is incomplete or lacks substance, the user might lose valuable information about which resources are relevant for his search or not.

This question originates from an article about subject gateways, which defines simple annotation, short critical evaluation and an informative summary of content as three resource description categories.[124] We added the short description category

---

[123] Accessible via http://www.desire.org/handbook/2-1.html [last checked 16/2-2003]
[124] Robinson Lyn, Bawden David, Internet subject gateways, *International Journal of Information Management,* 19(6), 1999, p. 516-517.

because we lacked a forth one in the process of defining the resource descriptions. There is no standardised model for a resource description and there are different levels of resource descriptions, varying from just the title of the resource to long detailed summaries of content.

Whether a resource description is a short critical evaluation or an informative summary of content can be difficult to pin point, and the assessment tends to become subjective.

6. Is it possible to search or browse or do both within the service? How deep is the browsing structure?

Here we look into the different ways of providing subject access, either by searching, browsing or both. Are there several search options like simple and advanced search? If there is a browsing possibility, is it a deep or a shallow one?

7. What type of subject access does the service use: keywords, deeper classification structure, combination of thesaurus and classification?

There are different ways of providing subject access, searching either with controlled or non-controlled keywords or by browsing through a hierarchical tree. Both procedures might lead to the same or different results depending on the database structure. If the user is not familiar with a classification structure or does not know under what category a keyword belongs to, it might be difficult to browse for a relevant resource. In that case a combination of a thesaurus and classification can be used.

A different subject access depends also on what type of service that provides it. For instance, a QCSG provides a deep level of classification for the browsing structure, as well as controlled vocabularies like subject headings and a thesaurus).

8. What type of classification system does the service use?

Classification systems provide subject access primarily through the browsing structure. It is therefore important that the system is well suited for the specific subjects the service focus on. If the classifications system is not a universal one but is locally or internally created, it is necessary that it is constructed according to comprehensive and recognisable rules. Naturally it is also important that the user can easily get accustomed to the classification system.

It is also important to compare the different classifications systems when considering the future interoperability of the services, since "cross-browsing between different classification systems and browsing structures is much harder to achieve than cross-searching. It requires cross-walks and mappings between classification systems."[125]

9. Does the service include any value added features?

Value added features improve the overall impression of the service and add value to the service. Value added services are directories, discussion links, links to experts, community service links, event calendars, news, etc.

---

[125] Koch Traugott, 2000, p 32.

10. What language is used in the service?
Language is the necessary tool when accessing to resources, in other words provides subject access. We are looking at the language used within the service, in the metadata and resource descriptions, not at the language of the actual resources.

Appendix 2. DESIRE quality selection criteria list

The selection criteria list is taken from the document Specification for resource description methods Part 2: Selection Criteria for Quality Controlled Information Gateways, available at http://www.ukoln.ac.uk/metadata/desire/quality/

A list of quality selection criteria: a reference tool for Internet subject gateways

Contents

1. Scope Policy
The scope policy of a service states what is and is not to be included in the catalogue. This is broadly defined at the inception of the service for the identified target audience. In the selection process, the scope of the service will affect the first decisions made about the quality of the resources. Those falling outside the scope will be rejected, and those falling within it will go on through the rest of quality

selection process, and be evaluated in the light of the rest of the quality criteria. The scope criteria are the first filter through which the resources pass, and so are the most general criteria. They will tend to involve black and white decisions - either a resource falls within the scope or it does not. The most important thing to consider in choosing the scope criteria for a service will be the aims of the service and the target audience.

1.1 Information Coverage
Subject Matter
◦ What subject matter is appropriate for the target audience?
◦ Are there any subjects which will be censored (e.g. for ethical reasons, such as resources produced by hate groups or resources about bomb-making/paedophilia)
◦ How important is the subject matter of linked sites?

Acceptable Types of Resource
◦ What types of resource are appropriate for the target audience?
◦ Is the information Scholarly rather than popular?
◦ Does the resource contain more than just a list of links?
◦ Is the site either proven to be, or expected to be durable?
◦ Would a resource intended for use by an individual or local group be acceptable?
◦ Is it innovative - does it make breakthrough design elements?

Acceptable Sources
◦ Which sources of information are acceptable/appropriate for the target audience?
◦ Are academic, government, commercial, trade/industry, non-profit, private sources all acceptable?
◦ Are pages maintained by individual enthusiasts (e.g. students) acceptable?

Acceptable Levels of Difficulty
◦ What level of resource is appropriate for the target audience? (e.g. users may be school children or may be academics)
◦ Is biased information acceptable, and are opinions and ideologies acceptable?
Advertising
◦ Are resources that contain advertising acceptable?
◦ Is there a limit to the amount of advertising that is acceptable?
◦ Are there any forms of advertising which will be censored?

1.2. Access
Cost
◦ How is charging going to affect selection - is the service only going to point to resources that are free to access?
◦ Are there any price limits in terms of the access charge?
◦ What if resources are under copyright?

Technology
◦ What technologies are appropriate for the target audience? (forms, ismaps, databases, cgi scripts, Java applications, frames, web sites, gopher, ftp, WAIS, telnet)
◦ What connectivity does your audience have, and how will this affect selection?

◦ What software do your users have and how will this affect selection? (E.g. will resources that work well in graphicalbrowsers but not in line-browsers be accepted?)
◦ What hardware do your users have and how will this affect selection?

Registration
◦ Will the service accept resources where user-registration is necessary before the resource can be accessed?
◦ Is on-line registration acceptable?
◦ If users must negotiate written contracts before access is possible, is this acceptable?

Security
◦ When it is necessary for users to send confidential information out over the Internet, will the provision of a secure coding system or encryption affect the selection?

Special Needs
◦ Do your users have any special needs that will affect the resources selected? Large print or audio options for disabled users.

1.3. Cataloguing Policy
Granularity
◦ At what level will resources be selected/catalogued?
◦ Will resources be considered at the web site/Usenet group level or the web page/Usenet article level?

Resource description
◦ What is the minimum amount of information needed to create a resource description in your catalogue? I.e. what basic information MUST a resource contain to be selected? (E.g. in a WWW document, contact details, last update details etc.)
◦ Is there sufficient information to create a descriptive record (for your services 'minimum set')

Metadata
◦ Will the service accept resources with/without specific metadata?

1.4. Geographical Issues
Geographical Restraints
◦ Are any geographical restraints appropriate for your audience?
◦ Will the service cover information produced locally, from particular countries, particular continents or world wide?

Language
◦ Resources in which languages are acceptable/appropriate for your target audience?

2. Content Criteria: Evaluating the Information
These criteria are based on the information content of resources. The fact that the resources are Internet resources is not so relevant to the criteria in this section, indeed many of these criteria have been used by librarians in the selection of books and traditional information resources for many years. The criteria are listed in the main

headings and the left hand column. The right hand column contains some hints and checks that might be used to discern whether a resource meets with a particular criterion.

2.1. Validity
How valid is the content of the information?
◦ Does the information appear to be well researched?
◦ What data sources have been used? (The validity of these need to be evaluated -see sections below on authoritative and reputable sources)
◦ Do the resources fulfil the stated purpose?
◦ Has the format been derived from another format e.g. print? (Is it an electronic version of a printed book/newspaper etc.).
◦ Does the information claim to be unbiased (when in fact it's biased?)
◦ Are references given?
◦ Is there a bibliography?
◦ Does the resource have a scope statement?
◦ Is there any information missing?
◦ Is there any mention of the resource being available in another format?

Is the information what it appears to be?
◦ Why is the information there? What was the motivation of the information provider when they made the information available? Do they have an ulterior motive?
◦ Does the resource point to other sources which could be contacted for confirmation?

Is the content of the resource verifiable - can you cross check the information?
◦ Is it merely vanity publishing?
◦ Is there a request for payment?
◦ The URL - Does the URL support the claim of authorship?
◦ Email addresses given - Are emails for a publisher, the author, referees, sources, etc. given?
◦ Contact details given - Are addresses and phone numbers given that support claims of authorship, sponsorship etc.?
◦ Traffic levels - Are they high?
◦ Are the sources of the information stated?
◦ Is it an often cited source?

2.2. Authority and Reputation of the Source
Who provided the information?
◦ Is the source attributable to a reputable author or organisation?
◦ Is the origin of the document documented?
◦ Author's title and institution/company displayed?
◦ Is the information attributed to an author or editor?
◦ Have you heard of the author before?
◦ Is the URL a university server?
◦ Is the author someone who has been cited frequently by respectable sources?
◦ Do you know the educational background of the author?
◦ Do you know the occupational background of the author?
◦ Is the information written on a topic in the author's area?

◦ Is the author's full name displayed?
◦ Has the author had previous publications of note?
◦ Is a biography of the author given?
Has the information been filtered?
◦ How reputable are the 'filters'?
◦ Is the site sponsored by a company, organisation or individual widely recognised as an authority or expert in the field?
◦ Is the information peer-reviewed?
◦ Has it been refereed?
◦ Is the site sponsored?
◦ Has the site been reviewed by a content reviewing agency?
◦ What is the level of moderation for mailing lists and Usenet newsgroups?
◦ Via what source did you come across the resource? (i.e. did someone authoritative recommend it?
◦ Is there a common link to the page from a recognised authority?
◦ Is the site linked to by multiple Internet sites?
◦ Has the material been disseminated by a trade publisher?
◦ Is the publisher known to you and reputable?
◦ Is the publisher a recognised authority? Is the publisher a 'University Press'?

Is it by who it says it's by?
◦ Can the authorship be validated?
◦ Can claims to having been 'filtered' be validated?
◦ Can information located in the publication itself be used to determine the author's credentials?
◦ Is the author listed on say, the campus directory/organisational directory?
◦ Are there email contacts for the publishers/referees/sponsors?

2.3. Substantiveness
Is the information substantive?
Is there value added information?
◦ Does the resource contain more than contact details?
◦ Is the information full-text? (As opposed to just titles/bibliographic details)
◦ Is it merely advertising?
◦ If the resource consists of a collection of links is there substantial annotation or value-added information? (e.g. an *annotated* bibliography)

2.4. Accuracy
Is the information accurate?
Is the accuracy of the presentation adequate?
◦ Are you able to check the accuracy of the information?
◦ Does the page cite a bibliography or provide references to confirm the accuracy of the information?
◦ Is the grammar and spelling accurate?
◦ Is there a prevalence of typographical errors?

2.5. Comprehensiveness
What is the depth of the information?
◦ To what level of detail does the resource go?
◦ How superficial/exhaustive is the information?

◦ Is some of the information incomplete?

What is the breadth of the information?
◦ Are all aspects of the subject covered?
◦ Is everything you expect to find in the site there?
◦ Are there any logical gaps of information?
◦ Is the title informative?
◦ Is an abstract given?
◦ Is there an opening mission statement of the purpose of the resource?
◦ Are there stated criteria for inclusion of information?
◦ Does the index or contents page imply comprehensive coverage?
◦ Are key words given that indicate the information content?

2.6. Uniqueness
Is the information on the site unique?
◦ Is it primary material?
◦ Is there any original work available at the site?
◦ Does the material have any relation to other works?
◦ Is the site inward focused i.e. not just a list of links to external sites?
◦ Is there any value added?

2.7. Composition and Organisation
Is the information composed well?
Is the information clearly organised?
◦ Does the text follow basic rules of grammar, spelling and literary composition?
◦ Does it include jargon?
◦ Is the information within a resource phrased unambiguously?
◦ Is there a good structure?
◦ Is the information within a resource arranged logically and consistently?
◦ Is the information broken down into logical parts?
◦ Is the resource well laid out?
◦ Is the resource organised by the needs of the user?
◦ Is the information broken down into digestible parts?
◦ Is the content clearly described?
◦ Are the headings clear and descriptive?
◦ Is there evidence of internal standardisation (e.g. use of a 'style sheet'?)

2.8. Currency and Adequacy of Maintenance
(See 'Resource Integrity' section for details of this section)

3. Form Criteria: Evaluating the Medium
Form criteria are based on the presentation and organisation of the information. Some of these criteria would be as applicable to paper resources as to Internet resources. Users need to be able to find their way around information objects, however, the evaluation of Internet objects will involve checking electronic forms and so will involve different evaluative processes. Once again the criteria are listed in the main headings and the left hand column. The right hand column contains some hints and checks that might be used to discern whether a resource meets with a particular criterion.

3.1. Ease of Navigation

Is it easy to navigate the resource?

Is it easy to browse the resource?

Is it easy to search the resource?

◦ Are there hidden layers that are difficult to discover?

◦ Does it take more than three 'clicks' (three links) to get to substantive information?

◦ Do all the links serve an easily identified purpose?

◦ Are all the links clearly labelled?

◦ Do you ever find yourself in a position where there are no hyper-links to anywhere else?

◦ Are hyper-links ambiguous i.e. is it obvious where a link is leading you to?

◦ Do images support ease of navigation?

◦ Are graphics/sounds/videos clearly labelled and identified?

◦ Can pages or portions of a document be printed separately?

◦ Are there single document options for those resources that may be printed?

◦ For discussion in mailing lists and Usenet groups, are digests available?

◦ Is there an index?

◦ Is the resource indexed electronically?

◦ Can a particular page be located from any other page?

◦ Are there good back and forward links between pages?

◦ Are the individual web pages concise or do you have to scroll forever?

◦ Does the system have an effective search facility?

◦ Is keyword searching possible?

◦ How effectively can information be retrieved from the resource?

◦ Is a well know search engine provided?

◦ Does the search engine allow the use of Boolean operators?

3.2. Provision of User Support

Are there instructions?

Is there documentation?

Is there online Help?

Is customer support and training provided?

◦ Do essential instructions appear before links and interactive portions?

◦ Is there online documentation?

◦ Is print documentation available?

◦ Is there any online help?

◦ Is contextual help available?

◦ Is there an email 'Help Desk'?

◦ Is there a telephone helpline?

◦ Are training materials/courses provided?

3.3. Use of Recognised Standards

Are recognised standards used?

◦ Is metadata provided?

◦ Does it use standard multimedia formats? (e.g. MIME)

◦ Is it written in standard HTML?

◦ Have proprietary extensions to the HTML been added that some browsers will not recognise?

3.4. Appropriate use of Technology

How appropriate is the format?
◦ Does it do more than can be done with print?
◦ Is appropriate interactivity available?

3.5. Aesthetics

Has consideration been given to the appearance of the site?
Does the resource follow good design principles?
◦ Does it look and feel friendly?
◦ Is the balance of text, images, links, headers, font sizes and white space good?
◦ Are the size, colour and animation of the images appropriate?

4. Process Criteria: Evaluating the System

Process criteria are based on the processes which exist to support the resource. Unlike form and content criteria, these will be related closely to the fact that these are Internet resources. The fact that information on the Internet lacks the integrity of a published work raises a number of questions about the quality of a resource over time. The system that lies between information provision and information retrieval contains many variables, and some evaluation of these is needed to discern the quality of the resource. The criteria are listed in the main headings and the left hand column. The right hand column contains some hints and checks that might be used to discern whether a resource meets with a particular criterion.

4.1. Information Integrity (work of the Information Provider)

Is the information current and up to date?
Is the information durable in nature?
Is there adequate maintenance of the information content?
◦ If the site contains data or information that is time-sensitive, how current is this data and information?
◦ How current is the material included in each update?
◦ Is a date given stating when the web item was mounted?
◦ Are time-sensitive resources available in near real-time?
◦ Do the stated dates respond to the information in the resource?
◦ Is the date given stating when the web item was created?
◦ How time-sensitive is the information, and how does this relate to frequency of update? (e.g. for resources such as timetables, schedules and conference announcements)
◦ If it is a static resource (not updated) will the information be of lasting use to the audience?
◦ Is the information of a type that has a limited period of use?
◦ Is the information provider likely to be able to maintain the information (unlikely in the case of information provided by students).
◦ Is the resource improved and enlarged and updated appropriately?
◦ Has the data been updated recently?
◦ Is there a statement about the frequency of update?

4.2. Site Integrity (work of the Web-Master/Site Manager)

Is the site current and up to date?
Is the site either proven to be, or expected to be durable?
Is the site adequately administered and maintained?

Are there any dead links?
◦ Are all the pages dated with the last revision date?
◦ Are there links to sites that have moved?
◦ Is a version number for the resource displayed?
◦ Date of last update to the resource displayed?
◦ Is there a description of the update frequencies for the resources?
◦ Are you being redirected to a new URL?
◦ Does the organisation or person hosting the resource seem to have the commitment to the ongoing maintenance and stability of the resource?
◦ Is the site frequently updated/maintained?
◦ Is the site regularly updated?
◦ Are the downtimes announced?

4.3. System Integrity (work of the Systems Administrator)
Is the technical performance of the resource acceptable?
Is the system stable?
Are adequate measures taken to maintain the integrity of the system?
◦ Is the resource currently accessible?
◦ Are the connections to the site providing the information reliable and stable?
◦ Is it usually possible to reach the site or is it overloaded?
◦ Are the downtimes infrequent?
◦ Are the links reasonably stable?
◦ Can you review the peak usage time for the resource (to assess reliability)?
◦ Is the site mirrored?

5. Collection Management Policy
The collection management policy of a service determines how resources will be selected or deselected in the light of the collection as a whole. The term 'collection' refers to the items currently described in, and pointed to by, the catalogue. Collection Management involves *de-selection* (weeding) as well as selection. The criteria listed below may be used to justify adding or removing a resource from the collection. These criteria account for the fact that a resource may be selected at one point in time, whereas it would not be selected at another. As the collection grows, the coverage and balance of the collection will change, and this may affect the selection process. The criteria are listed in the main headings and the left hand column. The right hand column contains some hints and checks that might help to discern whether a resource meets with a particular criterion.

5.1. Collection Coverage and Balance
What's already in the collection?
◦ What is the relative value of the resource in comparison with others already in the collection?
◦ Is the information unique within the context of the total collection or does it duplicate?
◦ Do a search to avoid duplication
◦ Browse to see which areas are well covered/where gaps in the collection are

5.2. Availability of Internet Resources
What's available outside the collection?

◦ What is the relative value or the resource in comparison with others available on this topic? Is there similar/better subject material available?
◦ Does the site contain information that is not readily available: would you have to look long and hard to find similar data?
◦ Look for other resources with value added to the information

5.3. Availability of Library Resources
What's available via other information sources?
◦ Does the resource provide access to information that is not easily obtained in other formats/not held in many libraries?
◦ Does the resource provide access to information that users may not be able to find/get access to in libraries?
◦ Look for resources which compliment existing information/library collections.
◦ Look for electronic versions of texts that are in great demand in libraries in paper format, and therefore, difficult to get hold of.