Preparing a Literature Search

This resource will help you begin searching for information at the start of your project. Once you have, or are close to having, the specific title of your project you need to start researching. This early research will give you some background information so you can present your proposal, which will be built on as your project progresses.

Think about the nature of your project.

- Does it involve building something physical?
- Does it involve developing software?
- Is it design-oriented?
- Does it include a critical analysis of some aspect of technology?
- Does it involve a modelling exercise?

Make a few notes on the nature of your project, including the *keywords*that best describe your topic area. When defining keywords, think carefully about the scope of your project so you can make a judgement about what to include and omit in terms of materials. A topic like ‘video processing’ may generate a huge number of potential information sources and papers, whereas ‘high-speed table-tennis ball-tracking applications’ may provide just a few very specialist articles.

List some of the information sources you may require. Depending on your topic area you might wish to consider:

- news sources
- company information
- standards and patents
- academic research papers
- technical data
- academic articles
- specialist technical information.

This is sometimes described as ‘the shape of the literature’. Which kinds of resources you use will depend on the nature of your project. You need to identify the places that will have the information you will need.

Checklist

- Consider the limits of your topic.
- Define your topic.
- Discuss your ideas with your tutor.
- Identify the main reference sources.
- Think about how best to keep track of things – be methodical in both the searching and recording of information.
- Plan your sources and begin searching.
- Appreciate whether a source contains peer-reviewed material.

Activity 1 Literature Search Tutorials

The following links provide a lot of useful information about searching and finding sources. If you haven't tried them already, work through them now, by following the links below..

Using Library Databases (this includes search strategy)

Using Google Scholar to search for information

Finding grey literature

Standards

Finding and using web standards

How to find patents.

Four stages of a literature search

Whether your literature search embraces scientific research papers or business documents, and whether it is either the central activity in your project or only provides a context for the project, the steps are the same.

The four stages in any literature search are:

1. identifying and locating relevant materials
2. comprehending the content
3. abstracting the significant content, systematically recording and categorising this content and the related references
4. synthesising the content and relating it to your project aims.

You will be asked to present aspects of your literature search at each stage of your project as part of the tutor-marked assignments (TMAs), but how you present your results will develop as you progress through the stages of performing the search.

1 Identifying and locating relevant materials

Look back at the notes you made for possible sources of information for your topic area, and also the keywords you selected. Can you now identify some places to investigate for information?

The Selected resources for your study area on the Library website will help you to identify resources and databases for all kinds of information.

You will need to keep a record of your searches and ideas. Keeping records in note form is fine at this stage. Make sure that you track your ideas, your citations, what searches you undertook and using which resources, what keywords and phrases you used, how successful the searches were, and so forth.

You might like to select a tool to help you save and manage your references. Guidance for choosing a tool is available on the Bibliographic management page of the Library website.

2 Comprehending the content

Comprehending the content of academic articles is a skill learnt through experience. Use the resources provided for scanning articles, making brief notes (pencil and paper or electronic) as an aide memoire. You can then construct a summary of the main points, perhaps commenting on their relevance to your topic.

Keeping an *annotated bibliography* may be especially beneficial when narrowing your search, so the reasons for either omitting a particular article or dismissing an argument can be easily referred back to. Like a bibliography, an annotated bibliography contains a list of references and other sources, but in addition includes a precis of each entry together with an assessment of its bearing on your research problem. Consider the following Harvard-style reference:

> Sohel, F.A., Karmakar, G.C., Dooley, L.S. and Bennamoun, M., (2012) 'Geometric Distortion Measurement for Shape Coding: A Contemporary Review', *ACM Computing Surveys*, vol. 44, no. 2, pp. 104–22.
>
> *Comments: Interesting position paper on geometric distortion measurement, the metrics used and their impact on video shape coding from RD and complexity views. It discusses shape deformation and proposes new ideas but only in high-level terms. May be worthy of more detailed investigation in due course.*

Many databases offer a download citation facility to enable you to directly import the full citation and abstract of a paper.

3 Abstracting the significant content

You will need to learn to understand and extract the relevant information from your sources, and to suppress and reject irrelevant information. Again, remembering to keep accurate notes of your thoughts and possible uses of the information will help you.

How does one discern the wheat from the chaff in terms of the relevant literature? It is a skill acquired through experience, but here are some useful tips to guide you:

- Wikipedia is definitely not an appropriate referencing source. Admittedly it can be a good starting point, but be warned: it contains a lot of pseudo-science and poor research.
- Is your source peer-reviewed? Be cautious of claims made in any non-refereed publication – trade magazines, newspapers and technical data sources are generally not peer-reviewed. Looking at both the editorial policy and who the members of the reviewing panels are can be helpful in deciding on the authenticity of a source.
- Be aware of the reputation of a publication and what the *impact factor* (IF) of a journal/magazine means. This can be insightful in appreciating the quality and relevance of an article. The IF of most journals is published by Thompson Reuters (formerly ISI) Web of Science, and can be accessed via this Library link (look for 'Journal Citation Reports').
- How widely cited is the paper? Google Scholar will provide you with some indication of how many other researchers have referenced a particular paper.
- You might like to consider this activity on Citation Searching (IEEE Xplore and Google Scholar are the examples used).
- In both the computing and IT disciplines, top international conferences are regarded as the most effective mechanism to rapidly disseminate new theories and concepts to the community. As a consequence, these conferences tend to have low acceptance rates (<20%). There are useful resources that provide statistics on acceptance rates, for example there is one for the major ACM and IEEE sponsored conferences.

You will find a range of useful online training sessions in the Library Online Training area to assist you in this 'abstracting the significant content stage'. The TM470 OULive session from the Library will be particularly beneficial.

4 Synthesising the content and relating it to your project

The final step is to assemble the assorted information you have identified and to relate one item to another. Some guiding questions may be:

- Is what you found useful?
- Did you largely understand the material you located?
- Has it generated some offshoot ideas you would like to investigate in further detail?

- Have you identified any clear trends?
- Is a lot of topical literature being published, i.e. is it a *hot topic* or a more mature area?
- Is a project problem or question emerging?

This will be an iterative process and you will need to be prepared to go through the cycle a number of times as new ideas and concepts materialise. In fact, you should view literature searching as a continual process from the outset, since you will not immediately discover all that is required.

Maintaining an up-to-date awareness of the literature as your project progresses is vital, as is keeping accurate notes and a project log of what you have found and your thoughts on ideas and methods you have uncovered.

To assist, the Library has some useful resources to support your ongoing literature search. These include facilities via email and RSS feeds so you can be immediately informed when, for example, a new book, journal paper or magazine article is published relevant to your topic.

Zetoc, the British Library's Electronic Table of Contents database, offers search, alerts and RSS feeds. Why not explore its potential to assist you in appreciating the value of literature alerts?

Library Zetoc Activity

Summary

First stage: ***Identify***, within all the materials you find and read, which ones are relevant in some way, either to the requirements of your project or to the decisions you have made on how to approach your project.

Second stage: Summarise each of the relevant sources of information, to ensure you have ***comprehended*** their content.

Third stage: ***Abstract*** the key requirements of your project, perhaps as a set of bullet points. These can then be used, for each reference in turn, as a framework to organise the relevant points that are made. Just as you need not discuss irrelevant documents, it is not useful to include in your final search irrelevant detail from your initial searches.

Fourth stage: ***Relate*** the outcomes of the second stage to your project requirements. How does each source of information fit with or address the needs of your project? This is perhaps the most crucial stage of constructing a literature search, but it is the stage that enables you to use the literature search to help you in your project, rather than just trying to show how much you have read.