

# Project Choice

## 1 Introduction

**Before reading this document it is essential that you have read the TM470 Study Guide.**

The *Study Guide* explains what a project is and how it is assessed.

The aim of this document is to help you choose the area in which to do a project and possibly help you narrow down your choice within that area.

In the *Study Guide* there is a brief explanation of what a project is. It is important to understand the nature of what you are undertaking in doing a project. So what do we mean by a 'project' and an 'individual project'?

The terms 'project' and 'project work' are often used to describe activity that is not part of normal day-to-day process, although some kinds of job (e.g. in software development or in architecture) are built around a succession of distinct projects. Here is a dictionary definition of project, from the *Longman Dictionary of Contemporary English*:

a carefully planned piece of work to get information about something, to build something, to improve something, etcetera.

The definition suggests that projects are self-contained pieces of work, around a specific goal, and that the planning of it is a crucial ingredient.

No doubt you can find other definitions, but for the purpose of this module here is a list of some key attributes that are associated with projects:

- They are unique – i.e. specific to a particular set of circumstances and not part of routine activity – and would not arise without deliberate intervention.
- They are planned around a collection of available resources, schedules, budgets, etcetera.
- They are self-contained around aims and objectives, and it is possible to decide when they are complete, and whether they have been completed successfully.

Individual projects are all of those things, but are further constrained: the project is defined, planned and executed by a single person, in this case you.

**So what constitutes the main aspects of a TM470 project?**

It is a project that:

- identifies a problem
- is practical or has a strong practical context
- will have a proposed solution using computing and IT
- will include aspects of planning, evaluation and revision
- will be broadly based on one or more level 3 computing and IT modules
- will not be pure research but will extend and apply what has previously been learnt at level 3 to a practical problem.

In this project module, you are the driver and the engine. We expect you to take ownership of, and responsibility for, all aspects of the project, including the learning experience the module is designed to give you. This does not mean that you are expected to work in complete isolation. Many projects benefit from the involvement of a user or a client. You are free to discuss your project, test your ideas, explore alternatives with fellow students, with people in your immediate surroundings or at work.

Of course one very important person with whom you must discuss your project ideas is your tutor. You should contact him or her as soon as possible after they have been allocated, ideally in the first two weeks of the presentation. Contacting your tutor before TMA 01 is a *requirement* of the assignment. We suggest you email him or her an outline of your project ideas as early as possible so they can make comments and suggestions. You may have several alternative ideas, in which case include all of them. If you are struggling to have any ideas, contact your tutor anyway and he or she will advise you. Many students leave this discussion too late and by then they have backed themselves firmly into a corner that may be difficult to get out of if then advised to do so. You should be prepared to modify your ideas based on your tutor's comments.

## 1.1 Project preparation forum

If possible we suggest you discuss your project ideas in the Project preparation forum before the module actually starts. You can learn a lot from other students by doing this. Not only can you benefit from considering the comments of others, but also phrasing constructive feedback and guidance to others helps your own learning and development, as long as it is done carefully and with appropriate reflection. This is known as peer reviewing. This forum will close soon after the module starts. After that you can continue discussing your thoughts and ideas on the other TM470 student forums. However, once you have been allocated a tutor you should whenever possible speak to him or her *first* if you have any concerns or difficulties with your project.

We expect you to identify clearly in TMAs and in your final project report (the EMA) any areas of your project where other people may have had a significant input. As is made clear in the study materials, we anticipate that you will draw significantly on relevant literature and technical sources – the key point is to make sure you cite these. Similarly, if you receive help from a fellow student, this should be acknowledged. Plagiarism involves an attempt to 'pass off' someone else's work as your own; if you acknowledge your sources properly, it is difficult for anyone to suggest you are plagiarising.

Having said that, a project that consists of virtually no ideas or solutions of your own is unlikely to score very highly. In making use of ideas from others, the secret is to draw openly on diverse sources and then to synthesise a solution from these that is of your own making.

Some tips:

- If asking for others to comment on your work, try to give specific questions you would like answers to.
- If commenting on someone's work, it is often better (though more difficult) to try to construct a series of questions that lead them to formulate a solution of their own.
- If someone asks for a very specific piece of guidance that provides some small piece of the larger jigsaw that is their project, there is little harm in giving them a fairly direct pointer.
- When you do draft some feedback, avoid pressing the 'send' button until you next log in: use the 'save as draft' button then reread it before sending.

All of the above apply whether you are using the student forums, instant messaging, email or anything similar. If you discipline yourself to exchange comments and contributions via the forums it is much less likely that anyone will suggest you have secretly colluded!

## 2 Why is the project important?

The final-year project is important for several reasons:

- it is the largest single piece of work you will do during your degree programme
- it is the part of the curriculum that allows you to specialise in a topic you are good at or enjoy
- it is the part of your degree that prospective employers will most likely ask you about at interview
- it allows you to show off a wide range of the skills and knowledge learnt during your programme
- it encourages integration of material learnt in the rest of your degree.

## 3 General requirements for projects

Obviously, it is not always sufficient just to have a problem to solve or a question to answer to form a project. Some problems are so simple to solve that they wouldn't make an interesting (or academically worthwhile) piece of work. This doesn't necessarily mean that you have to look for a problem that has never been solved before, but projects that simply set out to repeat someone else's work are weak unless they incorporate some new aspect or adopt a different approach. For example, suppose you set out to replicate some of the functionality of a common software package but for a different context. You would have to select what functionality to incorporate in your system; you would have to reinterpret the functionality for the new context; you would be working under the constraints of time available to you; you would be restricted in the set of development tools available to you. All these would be problems unique to your project that you had to solve. Looking at a project idea from that point of view would make what would appear on the surface to be a well-known problem into quite an interesting one.

### 3.1 What will I be doing during my project?

During the course of a project, you will undertake many different activities.

These will include:

- defining the objectives of the project
- establishing your understanding of the background information
- establishing the criteria by which your solution(s) to the problem will be judged
- determining by what process the work will be carried out
- planning the detailed phases of the project
- adopting one or more methodologies
- analysing requirements
- using (or constructing) tools
- carrying out project work
- identifying at least one solution (try to think of more than one initially as it is easy to focus too quickly on a single solution which may not be the optimal one)
- evaluating your solution(s) to the problem
- reporting on your work.

Whatever the nature of the problem you set out to solve, the conclusion of your project should be whether you solved it successfully or not. Note that it is perfectly possible to pass or get a good mark on a project that does not successfully solve its problem, as long as something has been learnt from the project and it has been properly evaluated and analysed.

## 4 Identifying a topic

The first step, and one you need to complete for TMA 01, is to decide which project topic to pursue. Getting the topic right has disproportionately positive consequences later on: choosing and scoping an appropriate (and solvable!) problem to work on is a very important part of successfully completing a project.

This part of the document aims to help you identify and gradually refine a topic that is right for you, or to make sure that your initial choice is suitable, by checking different factors you should consider. When you registered for the module, you were asked to commit to a general area so we could allocate you a tutor with matching expertise. However, you should not expect your tutor to understand your particular project area in detail – that is *your* responsibility. Instead you should regard him or her as a mentor – someone to provide generic advice and support throughout your project.

Other than deciding on an area, *it is a good idea not to settle immediately on the first topic that comes to mind, but to explore and weigh up a couple of alternatives*. Even if you have a clear favourite, you will benefit from taking the time to revisit your choice in the light of some of the factors we highlight in this section. This gives you an opportunity to consider whether you have picked the best project, or to make some adjustments to your initial choice. If you find it hard to think of any topic you might like to pursue, then do not worry at this point. This is a common experience, and you will need a little time to think through options and decide.

## 4.1 Your individual project and your degree

In the UK, computing and IT-related BSc degrees typically include a ‘capstone’ project: an individual project that builds on an aspect of advanced (level 3) material and is therefore undertaken towards the end of the programme of study. A project gives you the opportunity to explore an interesting practical problem in depth, and to make visible your personal achievements by drawing together and showing to best advantage the abilities and skills you have acquired in the course of your degree. These may be abilities and skills that are particularly useful in a professional context, and a well-executed and well-presented project can be a considerable asset in job interviews. You may also choose to try your hand at a more research-oriented problem, perhaps as a stepping stone to further study.

The individual project provides you with a vehicle to demonstrate abilities and skills associated with ‘graduateness’ in a highly individual way. The module’s stated learning outcomes unpack these abilities and skills in the context of a computing and IT-related undergraduate degree. These learning outcomes, stated in the TM470 *Study Guide*, are the basis for the assessment of the module. Now is a good time to take stock of them as preparation for selecting a topic; whatever problem you choose to pursue, you must make sure that it lets you demonstrate that you have achieved these learning outcomes.

## 4.2 What constitutes a suitable project?

TM470 projects can be categorised into three main types: research, development and evaluation.

- Research projects involve addressing a research question or analysing the possible solutions to a research problem, making detailed recommendations. This typically involves investigating the relevant academic area in depth.
- Development projects involve creating something: processes, algorithms, software, hardware, interface design, etcetera.
- Evaluation projects are sometimes named ‘compare and contrast’. You might compare processes, analyse an implementation, assess different user interactions, etcetera.
- Your project **must be substantially within the computing and IT domain. Projects should build on one or more of the computing and IT subjects you have studied (or are studying) in your level 3 modules**. For example, investigating a new wireless technology, writing a database program, learning a new programming language or trying out a different hardware platform would not meet the requirements unless it applied learning from level 3 and techniques or analysis beyond those you have studied already in order to solve a problem that is either practical or has a strong practical context.
- You should only pick a Computing and IT topic outside those covered in your degree if you feel confident in your knowledge of the area and it links broadly with your level 3 study.

Examples of types of project that could meet the requirements are:

- investigating a new wireless technology (or aspect of a technology), evaluating its benefits with respect to a particular use or application and producing a well-argued report which includes a balanced and well-founded set of recommendations
- developing a software system to solve a real-world problem, making use of appropriate techniques and analysing the effectiveness of those techniques
- evaluating the impact of a specific new technology on a user community, e.g. an investigation of how the emerging and evolving techniques, technologies and tools will deliver the next generation of web applications; using neural networks to improve identification and authentication in online banking
- evaluating and comparing two user interfaces or two technology-enhanced user experiences designed for similar purposes
- developing a database and/or web interface for a particular use in a principled and systematic manner, critically evaluating their effectiveness.

All these would require the use of learning from level 3 modules and extend that learning by critically applying it. Please note that these are only examples and not suggested topics. Suggestions can be found in [Project ideas](#).

You may have acquired relevant knowledge from elsewhere, most likely from paid employment or from your other subject if you are studying a joint degree. This can also be used to contribute to your project, broadening your choice of possible topics. However, if this knowledge is to form an important part of your project, you must be confident that your understanding is of a sufficient depth or that you can rapidly achieve the necessary depth. For example, if you choose to use a complex statistical package you have only briefly encountered, you risk spending most of the project time learning the package and then having to rush your actual project work, which would be unlikely to produce a good result.

The project is not expected to include a major piece of original research, merely some component that is original for you. This means the project requires a period of literature review, investigation and assessment, in which you can come to grips with the new topic(s) and the techniques involved, and can make a reasoned decision about what approach and techniques are most appropriate.

## 4.3 External constraints

In the UK, individual computing and IT project modules, and their assessment, are usually designed to fit with a programme of study or a degree. Even so, the choice of possible project topics remains large, and it is important to pick a project that has the right computing content for the degree you want to get. External bodies scrutinising degree programmes or graduate portfolios typically look for a good fit between project and degree objectives, as a mark of focus and quality. Here is an example of how this is articulated.

The [BCS](#), The Chartered Institute for IT, is a learned society and professional body that operates under licence from the UK Engineering Council. Among other things, the BCS accredits computing and information technology degrees. Professional accreditation is seen as a hallmark of relevance and quality. Even if you are not planning to pursue BCS affiliation, its guidelines are helpful in setting out what professional bodies usually expect of an individual computing project.

The following is an extract from the BCS document [Guidelines on course accreditation](#) (2015).

It is expected that within an undergraduate programme, students will undertake a major computing project, normally in their final year and normally as an individual activity, giving them the opportunity to demonstrate:

- their ability to apply practical and analytical skills present in the programme as a whole
- innovation and/or creativity
- synthesis of information, ideas and practices to provide a quality solution together with an evaluation of that solution
- that their project meets a real need in a wider context
- the ability to self-manage a significant piece of work
- critical self-evaluation of the process.

(BCS *Guidelines on Course Accreditation*, Section 2.5.2)

The guidelines also state:

Projects must involve the production of a report which should include:

- elucidation of the problem and the objectives of the project
- an in-depth investigation of the context and literature, and where appropriate, other similar products
- where appropriate, a clear description of the stages of the lifecycle undertaken.
- where appropriate, a description of how verification and validation were applied at these stages
- where appropriate, a description of the use of tools to support the development process
- a critical appraisal of the project, indicating the rationale for any design/implementation decisions, lessons learnt during the course of the project, and evaluation (with hindsight) of the project outcome and the process of its production (including a review of the plan and any deviations from it)
- a description of any research hypothesis
- in the event that the individual work is part of a group enterprise, a clear indication of the part played by the author in achieving the goals of the project and its effectiveness
- references.

(BCS, *Guidelines on Course Accreditation*, Section 2.5.1)

We expect that the vast majority of projects that are suitable for TM470 will also meet the BCS requirements. However, if you want to pursue BCS affiliation, and especially if you are considering a mainly research project, you should check that it follows the above guidelines. In particular you should ensure that you will be able to demonstrate the 'ability to apply practical and analytical skills', that the project 'meets a real need in the wider context', and that there will be an outcome (which does not have to be a software artefact) that can be evaluated.

## 4.4 General project requirements

The BCS guidelines closely match the learning outcomes for TM470. This is intentional, of course, and some of our degrees have BCS (and Institution of Engineering and Technology) accreditation. Importantly, you are expected to choose a topic that fits with the overall objectives of the particular honours degree you are aiming for.

The emphasis on 'the programme as a whole' means that you should concentrate on areas covered in at least one of the level 3 modules you have taken. That is why, when you registered, we asked you to indicate a project area associated with one of our level 3 modules.

Note: Some of our honours degrees require you to complete a project in a specific area, and we will have asked you to give an indication that you were aware of this when you registered for TM470. Make sure that you check the constraints associated with the specific degree you want to obtain.

## 4.5 Identifying your topic

There is a very large range of things you can do for your project. For instance, you could pursue a theoretical question in a practical context, work through a requirements process, solve a practical design problem, conduct some experiments contrasting algorithms or applications, engage with a usability study, build an interface or an artefact, or solve a problem that requires you to do several of these things, and many more. You can analyse something such as the various technologies surrounding the High Definition (HD) systems.

You can investigate a topic such as cloud computing and its effect on software development, or the capacity of wireless networks, or the latest security level of IPv6 compared with its predecessors.

Picking a project topic is more than selecting a title: it also involves scoping the problem you are going to explore from a number of perspectives.

One perspective is that this topic has to suit you. The project should bring out the best of what you have to offer. This will also maximise your chances of success. Here are some tips that may help you explore what is right for you.

### **Play to your strengths**

The project gives you an opportunity to draw together, and show to best advantage, the skills you have acquired during your degree programme. In picking and developing a topic, you need to make sure you play to your strengths. So if you excel at program development, for instance, or service technologies for mobile devices, make sure that, among other things, your project gives you an opportunity to demonstrate these abilities.

In other words ensure you pick an area and a topic you find interesting and are good at.

Whatever the circumstances, you will be spending a significant amount of time pursuing your project, and you will do so largely by yourself. In the absence of external motivators, it makes sense to pick a topic that interests you and that you will find easy to remain engaged with for the duration of the module. One way of doing this is to work on a problem that has personal relevance to you – for instance because it ties in with some practical computing or information technology problem you need to solve at work, or because you can build it around a hobby.

### **Build in a challenge**

Easy projects can be very boring. You are more likely to enjoy the experience (and to get better grades!) if the project presents you with some challenges, and requires you to break some new ground. Projects that set an appropriate challenge are better showcases for your strengths.

### **Imagine a client**

It is perfectly appropriate to choose a topic where you are the instigator, driver and evaluator. On the other hand, in real settings it is users or clients who generate a problem and decide whether it has been solved. You may find it helps your focus to pursue a project that fits with your work, or where you have a client in mind. In general, the success of a project is determined by how well project objectives are met. Even if you do not have access to users or clients, you may find it helpful to imagine one and to focus objectives around the requirements of an imaginary customer who needs a problem solved.

### **Academic objectives**

Solving a practical problem, even for an imaginary user, can be a satisfying and absorbing experience – so much so that the academic objectives associated with the module fade into the background. Of course the topic has to involve a problem that interests you and that you have the skills to solve. It also has to allow you to take an independent approach, which you will be expected to motivate and evaluate, and to reflect on your learning experience. Academic objectives also have a personal flavour: reflecting on, and articulating, what you have achieved and learnt are an important part of the process. Working with the indicative grade-related marking scheme in the *Study Guide* at each stage of the project allows you to track academic as well as technical progress.

### **Think of success criteria**

When setting out to achieve something, you need to know both when you have achieved it (so you know when to stop), and whether you have achieved it successfully. Most aims and objectives, including personal ones, can be formulated in different ways. It will help to demonstrate success if your aims and objectives have clear and achievable success criteria associated with them from the start.

### **Be ethical**

You should consider any legal, social, ethical and/or professional issues relating to your project choice. *Legal, Social, Ethical and Professional issues* will help you with this.

### **Have fun!**

Solving problems relating to or using computing and information technology is fun, and the individual project is a unique opportunity for you to spend time solving a problem that captures your imagination and your interest.

## **4.6 Finding inspiration**

Making a choice of topic can be a daunting prospect. In case you do not have a clear view on the kind of project you would like to pursue, here are some ideas on where to find inspiration. You may prefer not to settle on a single topic immediately, but to select two or three possibilities and to spend a little time weighing them up against each other, perhaps making a few informal design sketches ‘on the back of an envelope’ or web searches in order to explore their potential and relative merits.

There are many sources you can take inspiration from, particularly on the web. A note of caution: you will find very few examples of ready-made and appropriately scoped projects, and you will never find one that is designed to bring out your best performance. Choosing and scoping a project is much more than choosing a title, and needs your personal touch to fit with your profile of technical and academic strengths and interests. Whichever route you pursue for finding inspiration, you should expect to do a substantial amount of work before you are ready to submit your first TMA.

We have included a list of *Sample Project Titles* which might help inspire you but do not just copy one as you are required to think of your own title.

You might like to start by briefly looking at pages 14-20 of the QAA *Computing 2007* body of knowledge. This is an attempt to capture the wide range of topics encompassed by computing; after finishing your degree you would only be expected to be familiar with a very small subset of this body of knowledge. If it does give you some ideas, *be careful not to be too ambitious* – you should only pick a Computing and IT topic outside those covered in your degree if you feel confident in your knowledge of the area and it links broadly with your level 3 study.

### **Journals and conference proceedings**

Computing and IT is a broad, popular and well-populated area in research and development, with a large, international professional body. This results in extensive literature covering all aspects of computing and IT. Most journals and conference proceedings are available electronically (the OU Library databases are excellent: do use them as well as web



search engines) and are a rich source of ideas. Replicating a published system or solution, or applying it to a different domain, is likely to lead to detailed insights that were not part of the original paper and that can be pursued and written up for a project. Often papers suggest further work that you may find engaging.

*Advantage:* Journal and conference papers will supply you with ready-made background material and a straightforward way to demonstrate wider relevance.

*Challenge:* You will probably have to read quite widely before discovering a suitable topic, unless you have some initial ideas about the kind of project you would like to pursue. Reading and making sense of research papers is very time-consuming. Be careful when scoping out the project: published work is often resource-intensive, and may have involved whole teams of people, so think through details carefully to make sure the project is achievable.

### **Colleagues, users and clients**

The involvement of a client or a user can bring very tangible benefits to a project, because their requirements provide a framework for setting out objectives and evaluation criteria for the technical part of the project. Colleagues can act as valuable sounding boards, or may have access to customers and users, even if you do not. Even if you define the initial idea for a project yourself, talking to people you meet in a professional context may help with scoping, or with adjusting and refining objectives.

*Advantage:* This strategy increases the probability that your project will be practical, grounded in a realistic setting and relevant in a wider context. User requirements provide focus when framing objectives and evaluation criteria, and you may be able to draw on client feedback as part of the evaluation.

*Challenge:* Solving a practical problem for a user or client is not enough: your topic has to allow you to meet the academic objectives, as discussed earlier, and you need to make sure that your topic is sufficiently challenging to do that. The pressures involved when working for a real client need to be managed to make sure the project remains within the resource and time limitations that you have at your disposal. You also need to assess the risks – for example, what would you do if the project specification is changed by the client part way through so it is no longer suitable for TM470?

### **Study materials, past TMAs, set books and conversations with your tutor**

Using a combination of these sources makes a lot of sense. Working from modules you have taken and from their set books will help to fit the aims of your project to those of the degree you are studying towards. Past TMAs will have reflected your strengths and weaknesses, as well as giving you an indication of how much you have enjoyed working on a particular kind of topic. Your tutor is an expert and will have a clear understanding of different types of projects, and how these fit with your chosen area of interest.

*Advantage:* You are working from past experience and an appreciation of your strengths, weaknesses and interests gained in the context of your degree.

*Challenge:* TMA questions are not designed to be project topics. You will need to think beyond your past experience, extend the scope, build in appropriate challenges and think about the academic objectives. Although it is acceptable to build on past work (e.g. a program or a database schema you designed as part of a TMA), it must be clearly acknowledged when this has been developed as part of another module, in the same way as you would expect to do for other external resources you draw on in the project.

### **Personal interest**

It is often possible to pursue a practical problem in a particular area of computing by relating it to some aspect of a hobby or a personal interest. For instance, if you are interested in genealogy you may apply a practical issue in database schema optimisation using family history data.

*Advantage:* This approach will enhance and sustain your motivation. Also, because you are likely to have expertise in the application area, you will be in a good position to act as a client or user, or to find users among friends or relevant interest groups.

*Challenge:* Issues in an application area should not overwhelm project aims and objectives. Acting as a client with a strong personal interest may stretch the ambitions for the project away from what you need to achieve for the module. During the project you may need to remind yourself that you are not the client, and to make sure that time set aside for the project is not absorbed by pursuing your hobby.

### **Universities' websites**

A quick search with a web search engine will produce lists of computing and IT project topics set at other universities. These may be good sources of inspiration as a starting point to develop your own version.

*Advantages:* Summary project descriptions on the web may give you a ready-made starting point, and you have some assurance that there is sufficient scope in the title to work up into a suitable project.

*Challenge:* Project descriptions are set in the context of degree programmes that do not necessarily fit the objectives of the one towards which you are studying. There is much more to choosing a suitable project than picking a project title. If you find some of the topic options attractive, you should still expect to refine and deepen your proposal, and be able to relate it to the aims of your degree.

## **4.7 Expertise and resources**

Your activities may depend on the availability of expertise, which you have to be able to source. This may become a pressing issue where it involves finding and securing the sustained help of other people.

Your own expertise is an integral part of the project, particularly if you selected a topic that brings out your strengths. Carefully think through the consequences of committing to activities that require you to acquire substantial additional expertise. For instance, it is almost certain that you will not have the time to become sufficiently proficient in a completely new programming language within the timescale set for the module. The appropriate response to discovering this is usually to recast the activity and stick to a language and platform you know well, unless your topic is crucially dependent on the learning experience.

If your topic requires you to settle on an application area, you may be able to choose one where you can provide the expertise, for instance because you have a hobby or personal interest. Similarly, where a project builds on what you do at work, you may be able to leverage a significant contribution from your own professional expertise or that of a colleague.

Where your own expertise is not sufficient, you will need to get it from other people. Their availability, and the level of their expertise, may put pressures on the achievability of several interdependent activities. Where you have to depend on others, including users and clients, make sure you build in sufficient time to manage the relationship. Be clear on what you will expect from them, both for your own benefit and for ensuring they understand what they are committing themselves to. Also, where their input is essential for key activities, you should think of fall-back solutions in case it turns out not to be available or appropriate. We recommend that you minimise the extent to which you have to depend on third parties.

It is important that you acknowledge significant contributions made by other people. The fact that you have engaged with experts, users and clients is often seen as a positive and quite demanding contribution: your reflection on it is an appropriate element of your end-of-module assessment (EMA). A note of caution: make sure that your third-party interactions fit with, and support, project aims and objectives.

### **Money**

Books on project management often list money as a prime project resource. In contrast, we give it only a brief mention here to highlight that it should not be a factor at all in this project module. It is not necessary for you to spend money other than for routine support items (e.g. printer cartridges or paper). If your activities are only achievable at significant expense,

then this is a sure sign that you need to adjust the project scope, objectives and possibly aims, or even abandon the topic.

## Data

You almost certainly will need some data, and thinking about how you are going to get it is good practice, even if the answer is straightforward.

Dependency on data may become problematic if your activities rely on substantial amounts of high-quality data that is not readily available. Some subject areas (e.g. machine learning, data mining, information retrieval) typically use data-intensive methodologies and techniques, and several large high-quality data collections are available. These may also be useful for projects in other areas, so you may be able to find a ready-made collection that suits your purposes. For instance, a project on localisation of web browsers could use Arabic or Chinese texts that are part of datasets developed to support research in information retrieval. Beware: large high-quality datasets are rarely available free.

If no suitable collection exists, the temptation may be to start creating your own. The decision to do so must be carefully weighed. Large-scale data collection and cleaning is extremely time-consuming, which is why the datasets mentioned earlier are expensive. For large quantities of data, you need to monitor carefully the amount of effort you spend on collection and cleaning. Also, the consequences of cutting corners on data quality may be severe, because poor data will invariably show through in your results (hence the ‘rubbish in = rubbish out’ principle). In the worst scenario, you may spend a disproportionate amount of effort and still end up with poor-quality data.

## Other people

Many projects will need, and indeed benefit from, the help and cooperation of other people. This may be in the role of users (e.g. for requirements elicitation or usability testing) or perhaps as respondents to questionnaires or interviews. Think carefully about how much your project makes demands on the time and goodwill of others. If it seems excessive, think about re-scoping the project, or even choosing a different topic.

## Software and hardware

All individual computing projects will have a dependency on some element of software or hardware that must be available. Beyond the obvious – such as a PC, word processor, or software associated with your other modules – your project may also depend on additional software, or may have special hardware requirements built in. The extent to which you can accommodate these depends on your circumstances: for instance, you may be able to use special hardware at work. Nonetheless, where such dependencies exist, you should think through the consequences, try to reduce the likelihood of problems (e.g. by sticking to supported software packages), and explore fall-back positions.

The university does not regard loss or failure of your computer as something that should disrupt your studies or affect submission dates. Please therefore make sure you have an active process for backing up important work and being able to recover it to a repaired or replacement machine with minimum disruption.

## Activity

Now hopefully you can formulate your initial project description. If you can, before the module starts, try out your ideas in the Project preparation forum to get feedback from your fellow students. Once the module starts, discuss your ideas in detail with your tutor. If you cannot think of any ideas still talk to your tutor – he or she will help you think through the issues and identify some possibilities.