Philip Weaver

Success in Your Project
A Guide to Student System Development Projects

Pearson

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PHILIP WEAVER (Wolverhampton University)

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normally include a critical evaluation of the development approach as one of its most prominent academic deliverables.

However, if you are able to exercise choice in your selection of a project approach and your project fits well with features listed against one of the approaches in Table 3.3, then you should certainly give that approach, or a close adaptation of that approach, serious consideration.

Your project is unlikely to fall neatly into any of the broad categories given in Table 3.3, so you will need to carry out some investigation in order to confirm the approach you should adopt. Most universities will expect your system development project to include a research element of some sort (unless your course is at HND level), even if it consists just of a brief review of the literature. In many instances one of the most appropriate topics for research will be an investigation into the approaches and methods that have been, or could be, applied to the type of development concerned. Chapter 4 provides some guidance on the specific questions you might wish to answer, and on how to conduct the research. At the very least your project should include a brief literature review in order to establish which approaches are appropriate for your sort of project, and to identify any specific issues that might arise from applying a given approach to your project topic.

The type of project you are undertaking is only one consideration (albeit a fairly significant one) in selecting your development approach. There are a number of other equally important things that you need to take into account before making your selection:

- **Techniques and tools available to you.** You may have a strong desire to explore and test the skills that you have already acquired during your studies, even if they do not appear to be a perfect match for the project you are planning to undertake. Alternatively, you may have access to a limited number of tools at your university or workplace, which may restrict you in your choice of development approach.
- **Time available to learn new techniques.** The timescales for your project will place strict limits on the amount of time you can spend on learning and becoming competent in new techniques. Not many students will have the time to learn a new method or approach in its entirety, but most should have the time to learn some new techniques that can be used to customise or supplement a method they are already familiar with.
- **University or course standards.** Your course or university may require you to use a standard approach or method (although this is not common). There may also be a limited number of methods that its lecturers are prepared or able to fully support as project supervisors. In all projects the experience of your supervisor will be a factor in determining your approach, as you will clearly get more direct support if you select an approach with which they are familiar.
- **Client policy.** If your project has an external client they may insist that you use their standard development methodology, or at least adopt an approach with which they are familiar.

- **Your career objectives.** If there are particular techniques or approaches that you feel may enhance your CV, then you may view your project as an opportunity to demonstrate or acquire appropriate skills.
- **Personal interest.** During your studies you may have identified specific techniques or tools that you would like to explore further. Your project provides an ideal opportunity to develop a deeper understanding of techniques and tools, even if you propose to apply them slightly out of their normal context.
- **Other team members.** In a group project, the wishes and experience of all team members will need to be considered in deciding upon a development approach. If consensus cannot be reached, and if there is no really obvious choice, your supervisor or tutor may need to advise or even dictate the approach you take.

3.5 Selecting and customising your approach

Customising methods

Most methods are designed to cope with levels of complexity that are far greater than you will encounter within an academic environment. So, once you have a clear idea of which method or approach is the most appropriate for your kind of project, you will need to consider how you will adapt or customise it to meet the needs of your particular development.

At the start of your project the emphasis of your customisation will be on establishing the techniques that you plan to use, and on how they will complement each other. Once your project is under way you will need to make more detailed decisions about how to adapt the individual techniques themselves.

There are two basic types of method customisation:

- **Method adaptation.** Virtually all system development methods come with a framework and set of products that are designed to cope with a range of project types, sizes and team structures. The project manager is expected to select the products that are appropriate to the project they are undertaking, and to use the flexible framework to create a project-specific plan. Most methods provide guidance on customisation, and some will also have suggestions on how techniques from outside the method can be used to support the core techniques. For example, fact-finding techniques are called on by all methods, but are defined in detail in very few. Where fact-finding techniques are not defined as a core part of the method itself, guidance will be given on where they should be used and how they feed into the method. It is also expected that projects will supplement the method with other techniques where the application has features that require special treatment not covered in depth within the method.

- **Method modification.** The second type of customisation involves modifying a method, by introducing replacement techniques into the project, or combining one method with another to create a hybrid method. For example, you could use the structured analysis techniques of SSADM for the early part of the life cycle, and then produce the system design using the object-oriented notation of UML if the target environment is object-oriented. Another example would be the adoption of a structured or object-oriented method for the development of the off-line components of an application, alongside the application of DSDM to the development of the GUI-based component (in a spiral GUI life cycle model).

There can be no hard and fast rules for customisation, as every project will have different needs and resources. Indeed for any given project it is possible to identify a number of customisations, all of which may be equally capable of delivering a solid system solution. In essence there is no single 'correct' customisation. However, your chances of succeeding in your project and of optimising your resources will be greatly enhanced if you have taken the care and time to make rational and informed decisions on how to customise your chosen method or methods. In many cases the customisation of your development method will be a key objective of your project, as will the subsequent evaluation of its success.

Table 3.4 lists the main activities that you need to complete when customising a method. Once the process of customising your method is complete, it is essential that you properly document your approach. This should take the form of a list of activities, products and resource requirements, all backed up with a convincing rationale for the approach you are adopting. Remember that if you want a good mark, it is not good enough just to blindly follow an approach covered in your lectures. A lot of what you produce by adopting a 'recipe book' approach would be irrelevant and time wasting. You will get much more credit for a thoughtfully constructed approach. The exception to this would be a project in which your objective is to explore the use of techniques specified by your course in the context of a real-world project, in order to test your ability to apply those techniques.

Whichever development approach or method customisation you decide to adopt, the key questions that your supervisor is likely to ask are the following:

- Does the application of your chosen method to the problem concerned represent a good academic test, i.e. will it prove to be intellectually and technically challenging?
- Does the chosen approach meet with the requirements of your course?
- Is the chosen approach capable of supporting the kind of development you are undertaking?
- If you are proposing a novel application of a method, have you considered fully the research implications for your project?
- Do you have the time and resources required to acquire and apply the skills and tools necessary to use your chosen approach?

Table 3.4 Method customisation

Activity	Comment
Review the literature	Literature reviews are covered later in Chapters 4 and 10. At the planning stage, in addition to researching appropriate methods for your type of project, you should also try to establish how these methods have been customised or supplemented. In particular you should look for innovative adaptations of your proposed method.
Look at past projects	Past projects are a good source of information on how methods have been customised across a range of project types. Be aware, though, that while past projects from your university library may give you some ideas of how to approach your project, they do not generally carry any indication of how successful they were.
Identify constraints	The tools and skills that you have available to you, or that you have the resources to acquire, may restrict your capabilities to execute some of the techniques of your chosen method. This should not be the case for the core techniques; otherwise you should look again at the method you are proposing to use. You will need to examine the 'missing' techniques to establish whether there are ways round them within the method, or whether you can substitute other techniques that you are better placed to use.
Analyse application-specific features	The features of your application may mean that some techniques are unnecessary or should be substituted with more appropriate techniques, e.g. if your application has a minimal user interface you are unlikely to require the use of sophisticated GUI design techniques; a simple prototype should be sufficient. Alternatively your application may require the development of specialist components that are not catered for within your method, in which case you will need to supplement your method with appropriate techniques.
Assess method guidelines	Your chosen method will usually provide some guidelines on customisation, although they may be rather general and high level in nature.
Identify method weaknesses and omissions	Every method has key strengths and weaknesses within it, or even (in some cases deliberate) omissions. For example, most methods deliberately omit specific guidance on fact-finding, while others are targeted at specific stages of the SDLC. In all cases you will need to identify the gaps (by reviewing the literature) and find techniques for filling them.
Identify key needs and products of each stage	You should check each stage of your project against the features of your application and project. All methods have a minimum set of techniques and products for each stage of the SDLC, plus a range of optional techniques to cater for different circumstances. You need to consider each of the optional techniques to establish if it is required for your project, and establish what the implications are if you decide not to use it. You may also conclude that different stages of your project require the application of techniques from entirely different methods, particularly in the technical design stage where environment-specific needs may dictate a specific set of techniques.
Check that deliverables required by course are in place	You will need to double check that the products and deliverables of your customised method still meet the requirements of your course.
Draw up skeleton plan	The planning of your project is covered in Chapters 5 and 6. As an input to this process you should check now that you have identified all the dependencies between your set of techniques and products, in order to ensure that you are not planning to use any techniques that require input from other techniques that you have not yet identified.
Verify training and resource needs	Once you have settled on a customised method, which by now should consist of a set of techniques and products, together with a framework of dependencies (skeleton plan), you should check that you have identified all necessary training and resources (such as software tools).

3.6 Summary

1. The stages that all development projects go through are very similar, regardless of the methodology, techniques or tools that are used. What changes is the way that we approach each of the stages, the precise tasks that we choose to carry out and how we sequence them.
2. Life cycle models provide a framework for managing and structuring a project, while approaches and methods provide the activities, tasks and deliverables that are used within that framework.
3. The three life cycle models that are used or adapted for use on student projects are the waterfall model, the spiral model and, to a lesser extent, the incremental model.
4. No development method should be taken as a recipe book that, if followed step by step, will churn out a perfect system.
5. Some methods are more suited to particular life cycle models than others, but the principles and techniques of any of the system development approaches can be adapted for any of the life cycle models.
6. Many student projects will use hybrids of the waterfall and spiral life cycle models. The spiral design model uses a waterfall structure for the early stages of the project and the spiral model for the physical design and construction stages. The spiral GUI model adopts a waterfall structure throughout the project life cycle, with the addition of a spiral structure for the delivery of just the GUI component.
7. Some of the most interesting projects involve the examination and exploration of techniques or approaches in non-standard situations. There are two basic types of method customisation: method adaptation and method modification.

4 Research issues

4.1 Introduction

The aim of this chapter is to introduce some of the basic research techniques, such as literature searches and the setting of research objectives, that are used within system development projects. As these techniques are frequently applied during the setting up of a project they are presented here in Part One. System development projects also make use of standard research techniques such as interviewing and questionnaires in the execution of a project, and these techniques will be covered in Part Two.

Learning Outcomes

After reading this chapter, you will be able to:

- Write research objectives for your project
- Understand the purpose of literature reviews
- Conduct a search of the literature
- Evaluate and record the results of your literature search

4.2 Research objectives

As discussed in Chapter 1, research at its most basic consists of a systematic investigation of some sort, leading to a novel insight or conclusion that can be backed up by the results of the investigation. Your conclusions may do no more than confirm previous findings or existing theory, perhaps in a context that has not been addressed specifically before, such as your place of employment. This is entirely acceptable, as long as you demonstrate that you have investigated existing theory as part of your literature search, and have come to positive conclusions in the light of that theory. What you must avoid at all costs is setting