Everything You Always Wanted To Know About MSc Projects

(well, at least a step in the right direction!)

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Slides available at
http://www.cs.stir.ac.uk/courses/msc/projects/MScProjectTalk.pdf

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Overview

- The goal itself
  - *What are the examiners looking for?*
  - *What's the deadline?*
  - *How does my project get marked?*

- Working towards your goal
  - *How to work on your project*
  - *Getting the most out of your supervisor*
  - *Preparing your dissertation*

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The End Result

- A **project talk:** Full day, late July/early August
  - *10 minutes each, to whole group - lunch included!*
- What do I hand in?
  - *To Divisional Office: submission form +*
    - Your dissertation – 3 **unbound** copies
    - Your project workbook
    - Optionally: extra material
  - ***One electronic copy of dissertation to Turnitin (on Succeed)***
  - *A **demonstration** of any software/systems you have produced.*
  - *(You get back one bound copy and your workbook.)*
- When do I hand it in?
  - *Deadline: Friday 12th September – (or end of studies date)*
  - *Extensions for **good reasons**: up to end of September by request to me, after that by application to the Student Programmes Office (there may be a fee)*

The End Result

- Who marks my project?
  - *Your supervisor and one other member of staff (second markers allocated in July/August)*
  - *Reviewed by the External Examiner*
- How do they mark it?
  - *You get a grade as for modules*
  - *The markers are looking for: Formulation of problem, discussion, approach, solution, evaluation, summary/conclusion*
  - *Quality of writing and presentation*
  - *Technical 70%, presentation 30%*
  - *Level of difficulty, level of achievement*
  - *An effective demonstration contributes a lot to our understanding and appreciation of your achievements*
  - *But the dissertation itself carries a lot of weight*

The Dissertation

- How important is the dissertation itself?
  - *Credit is given both for what you have done and for how well you write it up*
  - *However the evidence as to what you have done in your project is the dissertation itself!*
  - *So it is very important*
- How long should the dissertation be?
  - *A typical dissertation ends up around 40-50 pages with up to 10 pages of appendices*
  - *However it is better to concentrate on presenting your work well rather than trying to "pad it out" or "squish it up"*
  - *So **don't** take the guidelines as requirements or hard limits*

What Examiners Look For

Obvious:

- *They are looking to see what you have done in your project*

Not-so-obvious:

- *They are also looking to see that you have thought about what you have done. Very important!*

Showing thought

The following should all be included in your dissertation:

- Specification
  - *Clear problem statement*
  - *State clearly what it is you have chosen to tackle and why*
- Background
  - *Show awareness of what other work has been done in your project area*
  - *Refer to a good selection of available literature in the area, and/or similar existing systems*
  - *Has anyone else done something similar?*
  - *Identify and analyse the strengths and weaknesses of similar/related/existing work*
  - *Form conclusions and recommendations for your own work*

Showing thought

- Approach and solutions chosen
  - *Don't just say what you did, but also **why you did it the way that you did it**!*
  - *Were there choices of approach? And how did you choose?*
  - *e.g. Compare these three approaches:*
    - *"I chose Java because I knew it already and couldn't be bothered to learn an existing language"*
    - *"   "* (no statement at all - the student obviously didn't even think about which programming language would be best)
    - *"I chose Java because its database and networking facilities perfectly suited the approach that I needed to take"*
  - *Were there difficulties with your chosen approach(es)? How did you resolve these, or why was it not possible?*

Showing Thought

- Testing
  - *Functional testing – taken for granted, no need to report?*
  - *It is **very important** to do some **useability testing**. By yourself or do you need testers – "real users"?*
  - *You should **plan and report on the useability testing** carefully: How many testers were there and what evaluation were they asked for? What did they think of it? Is it user-friendly? What improvements did they suggest? **Design a specific test plan/task sheet/questionnaire, and give it in an appendix, with the survey results.***
- Critical evaluation
  - *Does your program work? **Discuss***
  - *How far does it achieve what you set out in your problem statement? **Discuss***
  - *Are there improvements that could be made? **Discuss***
  - ***Analyse the useability testing results.***

Showing Thought

- Conclusions
  - *What did you have to learn in order to do this project?*
  - *What have you learnt from doing your project?*
  - *Was it difficult? Any particular problems?*
  - *Were there insurmountable difficulties? Did you run out of time?*
  - *How have you benefited from the project?*
  - *Any lessons learnt that others might benefit from?*
  - *If you were to work further on it, what improvements would you make?*
  - *With hindsight, would you have carried out your project differently?*

Now that we've covered what the goal is, we look at how to work to achieve that goal...

Working on your project

Bearing in mind you are going to be writing-up later on, be very kind and helpful to yourself during your project work, to save yourself extra unnecessary work later on:

- You are required to keep a **project workbook**:
  - *A careful record of your progress, thoughts, ideas, observations, things you hear about, … words, diagrams, program code snippets, … URLs, book/article details, …*
  - *When you are writing up and you want to put all your literature references in your dissertation, you **don't** want hassle finding them again*
  - *Record why you did things, not just what you did.*
  - *No need for beautiful presentation!*

Working on your project

- Keep backups of your programs, data, and documents, labelled clearly, in a separate place
  - *Yes, very obvious, but disasters do happen to people every single year so it is worth mentioning!*
  - *Make separate back-ups of your program(s) every few days, in separate places, so that you have a complete history. This is useful if you get into a muddle and want to go back to a previous version that you know worked OK*
  - ***Back up your dissertation write-up too – a big investment!***
  - *Paper printouts of programs and dissertation are also useful in case of electronic problems, not to mention useful for looking over quietly in the library/pub/garden*
- Layout and comment your program(s) well at the time of writing, not later
  - *You may well quote program extracts in your dissertation*

Working on your project

- You may find it helpful to have several independent "threads" of your project for you to work on
  e.g.

  1) Doing some programming

  2) Research into background (literature, other software)

  3) Designing what the user interface is going to look like

  4) Writing the dissertation

  Whichever your preferred way of working, this means if you get stuck/bored/fed-up with whatever you are working on, or maybe you need your supervisor's help to proceed, you still have something else you can work on in the meantime.

Working on your project

- Communicate with your fellow students
  - *See who, if anyone, is working in the same sort of area as you, or who is using the same software. You may be able to have mutually beneficial discussions, or be able to swap hints, URLs, and other resources.*
  *Note: This is relatively **UN**likely to lead to plagiarism*
  - *Need someone to test your program? Find someone else who wants a tester for theirs and do some mutual back-scratching.*
  - *It is very useful for someone to read a draft of your dissertation and comment on it. Find someone who will do that for you if you do that for them.*

Getting the most out of your supervisor

- Using your supervisor well is important to producing a good MSc standard dissertation.

- Besides the supervisor's obvious role in providing planning, technical and presentation advice for your project, a couple of other points to consider:
  - *You only have 3 months, and your supervisor can make sure you don't go off in the wrong direction, either during the project work, or during the write-up, so don't avoid supervision.*
  - *Ideally not only will you benefit from your supervision, but your supervisor will also benefit from you: MSc projects can be very interesting and informative.*

Good supervision

- Have regular supervisions
  - *Normally between once and twice a fortnight is good.*
  - *If a regular meeting time is awkward, then at the very least, at the end of each supervision make sure you know when your next one is scheduled - nothing like knowing when the next supervision is to make you feel like doing some work!*
  - *Also having an appointment is reassuring if you haven't managed to get hold of your supervisor for a while.*
- Communicate well between supervisions
  - *Is it easier for your supervisor to be contacted via email, phone or in person?*
  - *Might your query need information to be looked up (email?)?*
  - *Or is your query more interactive (phone/personal visit?)?*

Good supervision

- A little preparation for supervisions can be useful
  - *Prepare a brief progress report*
  - *Be able to demonstrate progress*
  - *Try standard debugging techniques (& colleagues!) to find out why your program doesn't work before asking your supervisor*
  - *For program queries, make sure your supervisor can see and run a copy of your program (e.g. on a pen drive)*
  - *If you have a query that your supervisor isn't going to instantly know the answer to, then letting your supervisor know in advance (if possible), may get you an earlier answer*
- If you are not sure whether you are progressing well, it can be very helpful to ask your supervisor to check

Good supervision

- It is helpful to know about your supervisor's timetable and holiday plans
  - *It can help both you and your supervisor if you don't contact them at times when they are unavailable, and saves you worrying when you are next going to get help*
  - *Make sure you have plenty to be getting on with when your supervisor does go to a conference / on holiday (you don't want to get stuck in the meantime)*
- Similarly, make sure your supervisor is aware of when **you** are unavailable for any length of time
  - *Supervisors do get concerned if students disappear into thin air!*

Good supervision

- Your supervisor will be happy to read over draft dissertation material
  - *General advice on structure and content*
  - *Don't expect full spelling and grammatical corrections!*
- Give your supervisor **time** to read your drafts
  - *You may consider 24 hrs plenty of time but your supervisor won't agree if they are away for a couple of days or have several students' drafts to read!*
  - *Best to offer "nearly complete" material, one or two chapters at a time for reading*
  - *Don't simply offer the whole dissertation just before the submission deadline!*

Good supervision

- If something unexpectedly affects your work (e.g. illness, bereavement), do tell your supervisor
  - *They may be able to help or advise you how best to proceed as far as your project goes*
- Hopefully your relationship with your supervisor will be a good and productive one.
  - *If you do have problems, you can talk to your Course Director, Head of Division, or to another member of staff!*

Preparing your dissertation

There are various approaches and ways to think about the write-up of your work. Different ways suit different people. A few useful topics:

- The 6Ws
- Structure and Content
- General writing tips

6 Ws
Why, who, what, how, when and where

These are general principles to consider when writing any document. Considering these for MSc projects:

- Why? (the purpose of the document)
  - *Obviously "to pass my MSc":*
    - We would like you to demonstrate that you know how to write a good technical report
  - *Other reasons*
    - You probably want a record for yourself
    - The dissertations are also available for subsequent years of MSc students, some of whom may be interested in your project!

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6 Ws

- Who? (the readers)
  - *What background knowledge and experience do the readers have? What are they looking for in the document?*
  - *Obviously, your primary readers are the examiners.*
  - *For background knowledge and expertise, aim it at the level of someone who is knowledgeable about computing, but not a specific expert in your topic area (eg. your second marker and the External Examiner)*
  - *In practice, try imagining explaining your project to a fellow MSc student*

6 Ws

- What? (contents)
  - *See next section*
- How? Consider:
  - *What style of writing is most appropriate?*
    - *Formal but not stiffly so or using overly-long words. Don't use slang, otherwise your work dates very quickly*
    - *Avoid "I did this… I did that…" – reads too much like a diary*
  - *What diagrams/tables/screenshots are you going to need?*
  - *Are you going to need to use special tools (software) to produce any parts of your dissertation?*
    - *You will need to need to plan time to get sufficiently acquainted with it/them*
    - *Learn to use Word properly! (Template & tutorials on web site)*

6 Ws

- When? (writing plan)
  - *You should have started writing by the beginning of August.*
  - *Which to go for: the all-in-one-go approach, or the incremental approach (in parallel with your project work)?*
  - *The approach is up to you, but you need an explicit writing plan, with content and completion dates!*
- Where?
  - *Where is best to work to avoid interruption?*
  - *What information/facilities will you need to hand?*

Structure and Content

- Planning a good structure is vital.
  - *You need an overall view before you start writing*
  - *The better the structure, the more readable your dissertation will be*
- Put yourself in the reader's shoes when deciding what to put in where
  - *View your project with the eyes of someone intelligent who doesn't yet know about it (try!).*
  - *What are the main topics they are going to want to know about? In what order?*
  - *Bear in mind when ordering your chapters which sections the reader will or won't have read already*

Content

- Brief outline: See **template** on web site
  - *Cover sheet*
  - *Abstract (a **paragraph** to summarise your project)*
  - *Attestation (confirmation of authorship)*
  - *Acknowledgements*
  - *Contents*
  - *Introduction (write this first and last)*
  - *…main chapter**s**...*
  - *Conclusion*
  - *References/Bibliography*
  - *Appendices (eg. user manual, useability questionnaire, …)*
  - *Glossary?*
- Useful tip: go and look at previous dissertations in ???!

Plagiarism

- Plagiarism means presenting someone else's work *as if it were your own*.
- **Plagiarism is seen as a form of cheating**
- Review the University's policy at
  `www.quality.stir.ac.uk/ac-policy/Misconduct.php`
- Look at The Little Book of Plagiarism at
  `http://www.quality.stir.ac.uk/documents/`
  `BookofPlagiarism.pdf`
- and see our Divisional guide at
  `www.cs.stir.ac.uk/guides/avoiding-plagiarism.pdf`

- The main issue is that you may wish to:
  - *Include code from a book, web site, etc in your own programs/scripts*
  - *Include quotations (including diagrams) from books, papers, web sites in your dissertation*

Plagiarism – How to avoid

- Including material from elsewhere is OK, and natural, **provided that you follow good practice guidelines**:
  - *Most of the work **must be** your own*
  - *Wherever you include material from elsewhere, it must be clearly and openly indicated and the **source** of the material must be stated clearly*
  - *See the **Due Acknowledgement** section of the policy document above for detailed guidelines*
  - *If you include someone else's work literally then you must clearly acknowledge the original source*
  - If you *paraphrase* someone else's material *(rewrite the ideas/thoughts in your own words)* then this is **much better**, but you should still give acknowledgement

Writing tips

- Firstly, **if your first/main language is not English:**
  - Writing your dissertation will probably be quite a challenge!
  - Do not underestimate the task – start early!
  - Your supervisor will be happy to give feedback on the structure and content of your dissertation
  - But you should *not* expect full spelling and grammar corrections
  - And if the English is poor, then giving feedback on content will be very hard
  - Take full advantage of opportunities to learn **written** English well – reading novels, newspapers, etc
  - Contact CELT, or find a private tutor, if you need extra tuition

Writing tips

- Don't use a "diary"-type structure
  - *The reader wants an overall technical picture, not a day-by-day account of what you did, or what went wrong next…!*
- Plan before writing
  - *Having a clear outline makes it easier to fill in the gaps*
  - *The sequence of chapters, and possibly subsections, with outline of their content*
  - *Adding completion dates and rough sizes can help monitoring*
- After outlining the overall structure:
  - *A "fill in the gaps" approach deals with the whole of one section before moving onto the next section*
  - *A "top-down" approach starts with the outline of the structure and adds more and more detail, then polish, to all the sections*
  - *Choose which is best for you – or a hybrid…*

Writing tips

- Ignore the language to start with
  - *If you find it difficult to put pen to paper, don't worry about how to say it beautifully, just throw words at the paper to get in black and white roughly what you want to say.*
  - *It is easier to refine and polish words in front of you than to get it right first time*
  - *Plus if you have to scrap that section later, putting a lot of effort into getting the grammar/spelling right is wasted*
- Write then rewrite then rewrite (if you have time). And practice!
  - *A lot of "polishing" can improve your writing a lot*

Writing tips

- Don't be too egotistical
  - *Sometimes the word "I" is appropriate to use, but usually **rarely***
  - *"I did this", "I did that", all over the dissertation, doesn't come over too well to a reader. They are not reading your dissertation for a narration of what you did, they are wanting an **overall view** of your project and its achievements.*
- e.g.
  - *"I chose Java because…" is probably better as "Java was chosen because…"*

Writing tips

- Find readers for your draft (besides your supervisor)
  - *Offer to proof-read someone else's if they will do yours*
  - *Ask specifically what you want them to check - the level of explanation? Spelling? Grammar? Clarity?*
- Use a style with dated page footers for printing drafts
  - *Very useful when producing drafts and wanting to see which version you are looking at!*
- Don't forget to spell check and grammar check:
  - *Nothing gives a bad impression faster than poor spelling and bad grammar. There are computers and other resources to help you - use them!*

Other resources

Notes: (available from the MSc web pages at
`www.cs.stir.ac.uk/courses/msc/projects/`)
- *MSc Dissertation Guidance notes*
- *About the workbook*
- *Project syllabus*
- *The notes from this talk*

Books:

A wide selection, so here's a few available in the library:
- *Carey, G.V. (1971)* Mind the Stop
- *Barrass, R. (1978)* Scientists must write
- *Morris, J.E. (1966)* Principles of Scientific and Technical Writing

Other Resources

Word template and Word tutorials:
- *See MSc projects Web page*

Web sites:

An assortment of help is available including
- *How to write dissertations*
- *How to search the web effectively*
- *Grammar and style*
- *How to cite references for bibliographies*

At URL:

`www.cs.stir.ac.uk/~bpg/Teaching/`
`                    Reference/projects/`

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