HOW TO DO A CREST PROJECT

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1. What is a Project?

Many people spend a lot of their professional lives running small projects – even if they do not think of them like that. Revising for your exams can be treated as a project; should you progress to a university degree it is likely that you will have to submit a dissertation at some point – that is, a relatively long piece of written work - which could and should be treated as a small project. It is therefore a good idea to learn some of the methods of organising projects because they work for all these challenges. Doing a CREST project is one of the best opportunities you will have to get a head start in this extremely important life skill. Furthermore, big projects are only a lot of small projects joined together, so the same methods work for managing a dissertation, or the building of a Boeing "Dreamliner".

Projects all have:

- A definite start;
- An end – which is often a fixed date by which everything must be completed;
- A "delivery". That is "something that must be done".
- Resources you can use (which may just be your time, but might also be money and access to equipment).
- A "quality" requirement. The Dreamliner must fly safely *and* please the passengers. You need to pass your GCSEs with the grades that will let you progress to the future career you desire. You will need to produce a report to to satisfy the CREST assessment criteria.

The real challenge in completing projects comes from having to do the job in the time allowed while also meeting the quality requirement and using only the resources available. CREST projects typically have to be completed on an agreed time scale (say a couple of terms), and your main resource, time, will be in short supply because of the demands of doing your normal school work. All the work still has to be done in a way that meets the CREST Assessment Criteria[1].

It would be easy if you had as much time as you like. You will, however, normally be challenged with a problem that your mentors and teachers think can be done successfully in the time available, but only if you learn to organise yourselves to do just what needs to be done to get things completed by the submission date. If you are working with others, you will have to work together as a team, dividing up the work and coordinating what you do to make it all come together at the end. Even if you are working solo, you will need to use your time carefully and concentrate on the things that *need* doing (and not the things you *like* doing).

All this means that you must **make a PLAN**[2] that will help you get to the end successfully. Previously groups I have mentored that have achieved CREST awards almost always regret that they did not spend more time planning what to do when. Their failure to plan usually leads to completion-panic towards the end of the project, when they realise just how much has to be done to finish off on time.

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[1] https://help.crestawards.org/portal/kb/articles/criteria-for-bronze-silver-and-gold-crest-awards Last accessed February 2021.

[2] Phrases I put in bold are golden nuggets of advice that it took me years to learn. Ignore them at your peril! They make the difference between success and failure.

Any reasonably sensible plan is better than no plan at all. If you do not know what target you are aiming for you are very unlikely to hit it. When you go for the CREST assessment you get credit for a good plan.

In fact, large elements of the CREST assessment are about how you have learned to organise yourselves to do a complex piece of work: how you defined the problem, how you researched possible solutions, how you decided what a solution would look like. You will learn a lot on the way will be able demonstrate that you have learned by reflecting on your experience, and explaining how you would do better next time.

In this document I have mainly quoted from the **CREST Assessment Criteria** appropriate for the **Gold** award level. The criteria for the Silver level have the same titles, but you have to meet slightly less onerous conditions. The award criteria change from year to year, so you should at all times refer directly to the current descriptions on the CREST web site.

2. Doing the Project

2.1. What needs to be done?

It is quite remarkable how many projects fail because the team never really agreed what they were actually supposed to be doing. (As you know, there are no marks for giving a good answer to the wrong question!)

So, spend some time working out what sort of problem we have and what a good answer would look like, **and write it down!** You may well have been given a written specification of the problem by the "client". That is very helpful, but rarely explains everything you need to know, so you must **ask lots of questions**. The normal practice in many organisations is for the engineers who will undertake the project to **ask questions**, and then they write down their understanding of the problem and finally they **ask the client to agree** that the problem has been correctly described. (Engineers in critical roles often use this *three-way-communication* technique: I tell you something, you repeat it back in your own words, and then I confirm that you have understood what I just said. It works with relatives and friends too!)

This addresses the first two of the CREST Assessment Criteria, which are:

CREST Assessment Criterion 1.1: Aims and Objectives*: Students express their project aim in broad terms, setting out what they hope to achieve at the end of their project. They explained how they know will know they have been successful in achieving the aim. Also, they set out specific and measurable objectives for the project.*

- The project **Aim** is a broad statement of what you hope to achieve by the end of the project. It could, for example, be something like "*Improve usage of energy in the school.*" or "*Understand where stars form in galaxies.*" Aims are often as long a piece of string - a direction of travel but no specific end point.
- In order to measure what we have achieved and know when we have reached a good end-point we also define **Objectives**. These need to be stated in such a way that we know very **specifically** so we can **measure** our degree of success. So, "*Reduce total energy usage by 5% within one year as measured by utility bills."* is very **specific, measurable, achievable, realistic and timely** - or **S.M.A.R.T**. as all project managers like to say.

CREST Assessment Criterion 1.2: Project Context: *Students show comprehensive understanding of the wider context of their project, how it could be used, and the implications of this in the field more generally.*

*Y*ou will not know what a good solution looks like unless you investigate and document the "*wider context*" - that is the background to the problem and its relationship to what is already known. You cannot set realistic and achievable objectives unless you can precisely define the gap between where you are now and where you hope to be.

We will revisit this criterion below in Section 3.1.

2.2. Select Approach

Having defined the problem we can start thinking about how it might be solved.

At this point you begin to address

CREST Assessment Criterion 1.3, Selection of Approach: "*The student identified a range of relevant approaches – drawing on research and best practice in the field. They evaluated the approaches in detail.*"

You need to think about several different ways you might go about the job and select one of them using rational grounds that you document in your report. It is all too easy to focus on the first idea you come up with, and completely miss better ideas that you would have seen with a little more thinking. It is also too easy to see only the good points of your own idea, and fail to think about its weaknesses. **Critical thinking** is a difficult but very important skill and you need to work at it. In this context it will help if you can compare and contrast the good and bad points of several different approaches.

You are allowed to use judgement (guessing based on experience) here, because there is a lot you do not know at this point. A typical way of going about this would be to draw up a table in which the different strategies were arranged in columns and the rows would be assessment criteria such as "Cost", "Technical challenge", "Time required", "Value".. and so on. If you are lucky, one approach stands out as better on all you assessment criteria - but this rarely happens. So you now make the informed guess we call judgement.

2.3. Make a Plan

The CREST Assessment Criterion 1.4: Project Strategy. *The student communicated a well-developed approach for their project, identifying the key activities and milestones. They provided the rationale for their choice and described their decision making process.*

At this point in the project you just do not know all the problems that you are going to turn up, and you certainly do not know how you will solve them. The Project Strategy is about maximising your chances of avoiding the harder problems and solving those you cannot avoid. (So, for example, finding out what other people have already done in this area, what problems they had and how they dealt with them, is nearly always a good element of a strategy and you need to do it *before* you start anything else.)

Do not get hung up on wondering how to make a project plan. It is really easy if you keep things simple, and follow my rules. You can collect most of the information on an Excel spreadsheet.

Plans have to address three primary questions:

- **What needs to be done?** (In detail!)
- **When does it need to be done?** (And in what order?)
- **What resources do I have to do the job?** (Who will do it? What will they use?)

Some things need to be done before others. For example, you need to work out what the problem is before trying to solve it. Or, before writing up your final draft of the report, the main practical project work must be complete. Simple stuff really. There is no need to get hung up on it, but it *is* useful to know what you need to do next.

The first stage in planning is to break the job down (*divide and conquer!*) into smaller tasks. At the the earliest stages of the project you may not know very much about how you will go about the project, so you will not have many tasks and they will be fairly broadly defined. It is still worth **writing them down**. The initial plan might have the following "high-level" **work breakdown** (as it is usually known):

1. Define the problem
2. Investigate context and previous work.
3. Select Approach
4. Implement chosen solution
5. Write up results
6. Perform an evaluation of the project.

All these jobs pretty much have to happen in that order: you cannot implement your solution approach until you have chosen it etc… Furthermore, for CREST projects we often know when stage 6 has to be completed - the submission date may need to avoid school exams and so on. We can now make some guesses as to how much of our time we might want to spend on different parts of the project.

Let us suppose we have six months (that is 24 weeks) available: do we want to give one month to each task? This is unlikely - we will probably want to spend more time on some parts than others. Let me write down my first guess (and it is a guess) for a reasonable allocation of time, as it might appear in a spreadsheet:

	Task Description	Time estimate (weeks)
1	Define the problem	1
2	Investigate context and previous work.	4
3	Select approach	1
4	Implement chosen solution	10
5	Write up results	4
6	Perform evaluation of the project	2
7	Revising plans, meetings other administrative jobs.	2
	Total	**24**

Note that I have now put in a seventh task to take account of all the background organisational stuff that needs to go on all the time. Your plan might be different - but you can see that if you spend more time "Investigate context.." you will have less for "Implementing…"

The plan, by the way, is **always written down** and shared between everybody.

Do not underestimate the amount of time you will need for writing up, remembering that you will need to do at least one draft agreed between you and probably then leave enough time for someone else to read it and provide comments and have time to take account of the comments. (This is a very good idea!) Allowing 4 weeks for this is not excessive. In fact, I suspect the proportion of time to be allocated to each of the above tasks will not in the end look very different to my guess.

To do better than this broad division of time between tasks we need to know more about what we actually intend to do. So, while "Define the problem" is often a whole-team activity, "Investigate context…" is usually split into several sub-tasks that can be given to individual team members.

2.4. How Do I Work out How Long will Tasks Take?

Professional project managers always find this difficult. There are several approaches:

- Jobs like background research can be made to finish when the allocated time runs out. There is always more to find out and at some point you apply the chopper.
- Some jobs have very definite end points and you either get there (*win!*) or you do not (*lose*!). It may be that you can divide the task up into smaller jobs, all of which are like things you have done before, so you can make good guesses. Alternatively, in research labs you might have a problem like "Discover a new antibiotic." All you can do here is start…and see how it goes. If it is going slowly you can either give it more time or put more people on the job.

You can often get a better idea just by thinking about how a job needs to be broken down into smaller parts. So, for example, it is easy to see that the write-up part is unlikely to take less than 4 weeks if we make the following breakdown:

		Time (weeks)	Sub-task time
5	Write up	4	
-5a	Produce first draft		2
-5b	Get comment on draft from reviewers		1
-5c	Revise draft to take account of comments		1

You can probably see that it is very unlikely that each of these subtasks will take less than the suggested amount of time. When you start to think about what you need to do in detail you often surprise yourself, and realise that there is less time than you think to get stuff done.

At this point you may well decide that some of the things you thought would be nice to do are just not worth the time they might take. This is what happens on all real-World engineering projects. We trim down to just what we absolutely have to do to solve the problem.

No one ever said project management was easy. That is why the good managers are usually very well paid.

2.5. Get Organised!

CREST Assessment Criterion 1.5: Planning and Organising. *The student produced a comprehensive plan for their project. They demonstrated a high level of understanding of the tasks – the skill, time and dependencies required to complete them, and assigned resources and time accordingly. It is clear what the tasks are, how long they will take, who will do them and when..*

Get the right team: you need people with different skills and personalities. Some people are good at the "ideas" side of things, others are good at the "people" side of things, some are good at the organising. You need a mix and you need to ensure everyone is able to contribute to their best (otherwise there may not be enough time available to do a decent job).

Decide on responsibilities: everyone can't do everything. You will need to specialise – ideally taking account of preferences and personalities. So, you might, for example, decide to appoint a lead author, who worries about getting the final report into good shape, but gives different chapters to other team members to draft. (**Start as early as you can**.) However, there are some jobs that can involve everyone, like doing Web research.

Choose a coordinator: this is the person who checks that everything that should be happening happens when it should happen. Choose someone who is tactful and persuasive, but is also not prepared to be fobbed off with empty promises.

Talk to each other: meet to agree who does what and by when, and to find out what has actually been done since the last meeting. **Keep notes** – especially about who has agreed to do what, by when.

Constructively review each other's work: although you each have your own responsibilities, you can all help each other by critically reviewing what is being done, with the intention of **helping each other to do better**.

You all have to contribute: the CREST assessment process required that each individual member of the team should fill in a **profile form**, in which they explain their contribution to the project. It is therefore important that each member of the team can be seen to be pulling their weight. The **constructive review** process can be used as a justification for individual contributions to most aspects of the project, even though another team member may have been doing the bulk of the work in one area.

2.5.1. Why are Teams Important?

One of the most important parts of the CREST project is learning to work as a team. You will probably spend most of your working life operating as part of a team, so it helps to learn how they function. There are two big advantages in teams:

Each member brings their own skills to the team, things they *know* and things they can *do* better than anyone else. A surgical team, for example, has the lead surgeon, the assistant surgeon, an anaesthetist and surgical nurses supporting these roles. (There are indeed a very few people who seem to be excellent at everything they do – and you probably hate them.)

Successful teams often make use of different personality characteristics. People find it easier to change their skills and knowledge than their personality, so knowing what type of person you are helps you avoid roles that you will not enjoy. Recognising

personality types in other people helps you build teams to get things done. When you apply for a professional job these days there is a fair chance you will have to do psychological profiling so your prospective employer know what type of role will suit you best. However, most of us are instinctive psychologists and gravitate towards the right roles anyway.

In one common way of thinking about how teams work[3] there are three major divisions **Action** roles, **Thinking** roles and **People** roles, each with three subdivisions (Google "*Belbin team roles*"). That is, some people like to be *doing* (or telling others what to do), some are working out *what* to do, while others are acting as the social glue that keeps the team working together and communicating with the outside world (coordinating, making contacts, keeping the peace).

If you pack teams with people of the same personality type **nothing will get done**[4]. The action types will spend all their time telling each other what to do, without knowing what they really should be doing or being able to do it. The thinkers will just think…but will not start (or finish) anything, and the people-people will spend all their time being nice to each other or chatting about what is going on down the corridor. Hence, a good team will have people from each of these categories working together.

This of course is an over-exaggeration: people are not that simple, and most of us can (must) take on multiple roles (and the boundaries between roles tend to be rather fuzzy anyway). However, the central truth remains: you need diversity in teams. If you are good at spinning off new ideas, you need someone who can point out the fatal flaws; if you are good at coordinating and delegating, you need people who will actually do the work; if you are good at challenging conventional thinking, you need someone who will interpret the message and smooth ruffled feathers. If you are good at starting things, you need a finisher. A good engineer will always be a bit of a psychologist.

2.6. How to Get Things Done!

All that stuff above is just suppose to help you to do the right work in the right order. Don't let it get in the way of actually getting real things done. Here are some tips on getting things done.

Do the things you really need to do as early as possible. You have to do them so do them now. Get them out of the way. (I have to confess to being an Olympic standard procrastinator. Do what I say, not what I do.)

Do the risky things early. By "risky" I mean the things that you are not sure are going to work out correctly. Find out whether they are going to work as soon as possible, to give yourself time to try an alternative approach.

Don't ever, *ever* waste time. You can never get it back. At the end of the project when there are two weeks to hand in the report and it is only half finished, you will

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[3] The mass of Web information on personalities and teams should not all be taken as gospel. (Training consultants need to make a living by promoting an idea and selling a service. They may not be too concerned about the scientific basis of what they are selling.) There are nine "Belbin" roles in all and in general we can all do more than one, perhaps a *thinking* and an *action* role, but we tend to be happier working to our natural inclinations.

[4] If you ever do a team-building course for managers, you could well find yourself, as I did, trying to solve problems in a team of people who are all *just like you*. It was highly educational, but not an experience that I would willingly repeat.

really, *really* regret the early meetings when you messed around without getting anywhere definite.

Beware of spending too much time on things you *like* doing rather than what *needs* doing. OK! We all do it, including me. We all need to have a bit of fun in our lives, and no one will get any lasting satisfaction from always doing the boring necessary stuff. So please have some fun doing the project; just don't let it take over.

Don't spent time polishing things that don't need polish. Superbly crafted diagrams are very nice to look at, but a rough sketch may have done the job in a tenth of the time – and you will be less reluctant to change it when someone points out the problems. The CREST assessment will be mainly looking at the ideas in your report and whether they have been expressed clearly. The assessor does not care about the letter-font you have used to tell the story. Fancy formatting just distracts from the story, so keep it simple and save time and effort.

Monitor how you are getting on. If you are slipping behind where you thought you should be at a certain point, you either have to increase the work rate or think how do without some of the things you originally planned to do. It is best to discover this as early as possible, so you have time to adjust your plan. Plans always change! You will get credit for **making realistic adjustments to the plan as you go along**. You can show examples in your report of how the plan evolved.

Keep a project diary: When you finish a job listed on your plan make a note. When you hit an unexpected problem, make a note, and then make a note of how you solved the problem. Make notes about things that did not work as well as the things that did work. Make notes about things you find in your research, even if you do not take them further at that point.

At the end of a CREST project the assessment takes account of your reflections on what you have achieved. What did you learn? What went well? What went badly? What would you do again? What did you wish you had done? Write down experiences as you go along.

3. Do the Work!

3.1. Background Research

CREST Assessment Criterion 1.2: Project Context. *Students show comprehensive understanding of the wider context of their project, how it could be used, and the implications of this in the field more generally.*

CREST Assessment Criterion 2.1: Use of Material and Human Resources. *The students identified and sought out the resources and people required. They used them in an efficient and effective way.*

CREST Assessment Criterion 2.2: The student researched the background to the project and acknowledged their sources appropriately. *The student extensively researched their project. The research is relevant, accurate and reliable. A consistent referencing style has been used throughout (there are no requirements for a specific style to be used). At GOLD level most references are from primary sources.*

There are very few projects that start with a completely clean sheet of paper. They nearly always have to fit in to an existing context, and usually build on previous knowledge and work.

We have already mentioned ***Criterion 1.2,*** because it is hard to even set some clear project objectives, unless you have done a certain amount of investigation, but you may well refine your original objectives as you learn more. [5]

Almost every CREST project has a 'background research' phase, in which the team find out about the technical problems they are likely to face, what new knowledge and skills they will need to acquire, and what existing resources they are able to call upon.

Resources can be:
- Expert advice, from your local mentor, for example.
- Source of information in books or on the Web. (Do not forget books! It is easy to think that everything is on the Web these days, but while it can be easier to find stuff putting it together can be hard and knowledge in books is often better organised for learning.)
- Equipment. The Faulkes telescopes and the Sloan Digital Sky Survey are examples of equipment resources. You might also, for example, use a portable infrared imager to look for heat loss from buildings.

Use Citations: you must do this! (Criterion 2.2.) In spite of my constant emphasis on this, students that I have mentored have sometimes been strongly critiqued by assessors for insufficient citations. University students often have a hard time during their initial years as well. It takes time to get into the mindset of recognising when you need to cite, but it eventually becomes second nature.

A *Citation* (also known as a *Reference*) explains where you found information that you rely upon for your argument, or for the success of your project for which you have not developed original evidence of your own. There are many different, equally acceptable ways to include citations in documents. (If you want to see how you might have to do it in a year or two, most university libraries have on-line guidance. See for example: **https://www.open.ac.uk/library/help-and-support/quick-guide-to-harvard-referencing-cite-them-right**.)

One easy way would be to put a number in the text next to the point you are making, for example, "See the CREST Assessment Criteria [1]." and then at the end of the main body of your text you have a page with a heading:

> **References**
>
> [1] **http://www.crestawards.org/run-crest-awards/assessing-projects/assessment/** (Accessed July 2018.)

…. for as many citations as you have made.

Note that a *citation/reference* is very specific to a particular part of your text: you have claimed something as a fact and *this* [x] is the evidence. You will see in the above citation example that I have noted the date on which I confirmed that this web page contained the information that I cite. This is important for Web references because on-line documents can change rapidly. (In fact, this particular page had disappeared by September 2018!)

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[5] This also illustrates an important point about CREST Assessment: there is no simple relationship between any one phase of activity in the project and the assessment criteria. Most of the criteria - especially number 11..16 apply to ***all*** phases of the project.

You may also like to make a **Bibliography**, which is a page where you list sources of information that you have found generally useful for your research, and that other people (who read your report) may also find useful. You cannot, however, associated a particular specific claim with each such bibliographic source.

Keep a note of where you find information as you are doing your research. This is a very important habit to form - you will certainly need to do this at university. It is surprisingly difficult to go back later and remember where you picked up information. This really will save you a lot of time and anguish when you are starting to write up. Believe it! These days, professional researchers use electronic *citation managers* (I use Zotero) which replace the old card-indexes that I had to compile when a student. You get into the habit of dropping interesting material into the database as you come across it. I would hate to loose my citation database.

The GOLD CREST criteria refer to the use of *primary sources*. This needs explanation.

- A *primary source* is a description of original research: the document is making a claim and also giving the observations that support that claim. "*I claim that this is true because I did this experiment and got these results.*"
- *Secondary sources* are authoritative reviews of evidence based on primary sources. You can recognise them because they usually contain lots of citations to primary sources. Secondary source are often the most useful when starting a project because they give a broad overview of an area and show you where to start digging in detail. You are, however, getting someones *opinion* on the evidence that is relevant: it has been selected and filtered.
- A *tertiary source* is something like a text book that usually does not directly cite primary or secondary source (though some, particularly at advanced university level, do).

You need to be very careful with tertiary sources because their authors may not know what they are talking about and unless you can follow citations you cannot check what they say. A lot of material in Wikipedia is like this! It may be correct, but not necessarily.

Getting at primary sources has several problems because material published in professional journals is often behind "pay-walls". University students can jump the pay-walls with electronic access via their university libraries, but that route is not available to most schools. Despair not! There are several ways around this barrier.

Problem 1: Find out what exists. One of the easiest route in is via *Google Scholar* which is a specialise version of the Google search engine that focus on material published in academic journals. If you are lucky the search results *may* include a PDF download link against a results that looks interesting.

Problem 2: Your primary source is behind a pay-wall. (No PDF link on Google Scholar.)

- Strategy 1: Google the authors and attempt to find personal web pages at their affiliated institution. Many keep PDF copies of all the papers they have published there. (There is, however, sometimes an "embargo" by journals that prevents them doing this for year after initial publications, and then they just do not get round to keeping their publication list up to date.) I have found that this works surprisingly often.
- Strategy 2: Email the author, explaining what you are doing, why you cannot get access through the journal, and asking for a copy. Most respond positively.
- Strategy 3: Look for a "pre-print". It is common for authors to circulate pre-prints of research papers prior to their acceptance for publication by a journal. These days, this is often done by placing the document on an open-access "pre-print server", such as *arxiv.org* (which deals mainly with maths, physics and computer science). *Wikipedia has a list of pre-print servers* for other subject areas. A

professional research would be a little cautious here, because the pre-print version of the paper may not be quite the same as that eventually published. (It will be formally reviewed and is then frequently modified before final acceptance.) The professional would always check the the final published version. However, for a CREST project I would not worry too much about such niceties.

Problem 3: You do not understand what is in the paper. I once mentored a very good student whose project involved a clever maths calculation concerning black holes - just about the limit of what could be achieved with A-level maths, and had to read some of a university level textbook. She got the award but was criticised for not citing primary sources. Unfairly I thought, because primary sources dealing with black holes usually involve a lot of very heavy mathematics, way beyond A-level standard. Primary sources are often quite technical and you probably will not understand all the material, but you can look at the introduction and conclusions. (This is not always such a big problem: Einstein's original 1905 papers on Relativity and other topics require no more than A-level maths and they are written with great clarity. First year university physics students may well be told to read them because they are better than many popular expositions.)

3.2. Implement Your Chosen Solution

This is probably where you will spend a good deal of your time - and it is where you need to address a number of the CREST Assessment criteria (pretty much all of them so I will not list each).

Your chosen project may not so obviously address all of these criteria. You may worry about how can you be "creative" if your project is all about finding out what is know in a technical area. (This is a frequent concern with students that I have mentored.) The trick here is to pose a specific question for which there is no immediately obvious answer in the literature. For example, you may decide to investigation the technical issues of building a "Space Elevator". That requires reviewing the science in a number of separate technical areas, such as astronautics, propulsion, strength of materials, and seeing if they can be brought together to produce a novel solution. The invention of smartphones did not require new technology, but the original iPhone did combine existing technologies in a novel way.

Here are some tips which will make it easier for the assessor to see that you have met the criteria:

1. Keep notes of meetings where you make decisions. Record the reasons why you made the choices that you settled upon and who will do the required **Actions**.
2. Keep a project diary in which you record ***everything*** that went right and went wrong and what you thought about it ***at the time***. This will help you enormously with meeting Criterion 10 (see below). No apologies for saying this a second time: it is really, really helpful!
3. Where you think something is creative, say so!
4. Explain the connections to your research. Make it explicit in the text of the report so the assessor cannot miss it.

3. Write it up

The project is not finished until it is written up.

This will take longer than you think.

When I must write an important report I generally allow about 5-10 person-hours per finished page. When you do dissertations for your degree (or even assignment essays) this is what it will take to do a decent job. Less rides on your CREST report, so you do not need to polish quite so much. Nevertheless, I would be surprised if each of you does not need to find about 10 hours to work on the report.

I have written a separate guide[6] to writing up and I will not repeat the advice here.

[6] See http://mcellin.me.uk/artfulcomputing/images/Projects/HowToWriteAProjectReport.pdf last revised 2018.