Research Skills

Advanced MSc and PhD Students

http://www.cs.bham.ac.uk/~jxb/rs.html

Lecture 15
Work Management

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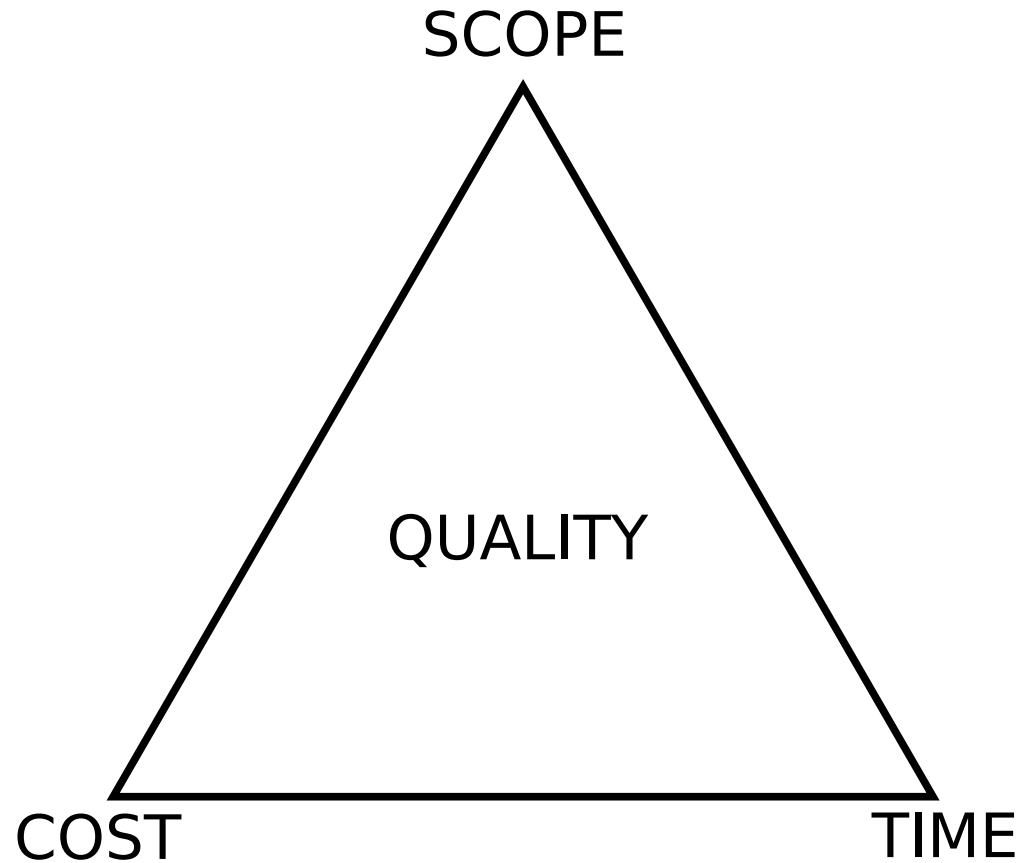http://www.cs.bham.ac.uk/~aqs

Work management

This lecture is a short and informal introduction to

- Project planning
- Management tools
- Time management

The purpose is to analyse problems and suggest solutions when working on a research project that requires months of years of work to complete

Triple constraints for projects

Triple constraints for a research project

Scope : varies for a MSc, a PhD or other research projects. It describes approximately the **extent** of the research, what it covers, what is to be achieved

Time : varies for a MSc, a PhD or other research projects (the longer is the time, the wider the scope)

Cost : the funding given by a sponsor or institution, and other facilities. E.g. the number of researchers on a project, the use of buildings, equipment, etc.

From the researcher's personal viewpoint, the cost has a different meaning. It can be seen as a mix of opportunities and drawbacks related to taking up the project

Example

PhD research project

Scope : produce relevant scientific results that prove the candidate's capability of carrying out autonomous and novel research

Time : In the UK is equivalent to a 3-year full time job or study.

Cost : might include funding from a grant/institution, supervision time, working place, facilities and equipment

Cost for the candidate : full time dedication (often more) implying giving up other career opportunities and jobs. As other jobs, it requires moving to a specific location.

Work management from the researcher's viewpoint

Project management for a company is different from **project management for a researcher** whose objectives are often inseparable form one's personal career, life or happiness

Project management for a researcher is deeply related with management of

- working patterns and styles
- personal time
- acquisition and awareness of personal skills
- psychological aspects (relations with colleagues, collaborators, motivation, self-discipline, etc.)

Project planning

involves :

- Dividing the projects in tasks or objectives
- Estimating the time to accomplish each task
- Judging the feasibility of each task and the requirements (skills, sources, tools, human resource)
- Re-planing or reformulating objectives during execution to fit previous point
- Understanding the relations and dependencies among tasks
- Considering the use of planning tools

Example of task

Task : Literature search

Skills required :
  - use of search catalogues
  - archive and retrieve references

Dependencies :
  - acquisition of basic skills in the subject (for example math, biology..)
  - general knowledge in the field

Example of task - II

Task : Formulation of hypothesis or research questions

Skills required:
- Deep understanding of the field
- Active and critical vision on the specific topic

Dependencies :
- Literature review
- Talks to supervisors or collaborators
- Brainstorming

Example of task - III

Task : Experimental verification of hypothesis

Requires skills :
 - use of experimental equipment, or software tools

Dependencies :
 - formulation of hypothesis
 - decision on precise scope of the verification
 - feasibility study
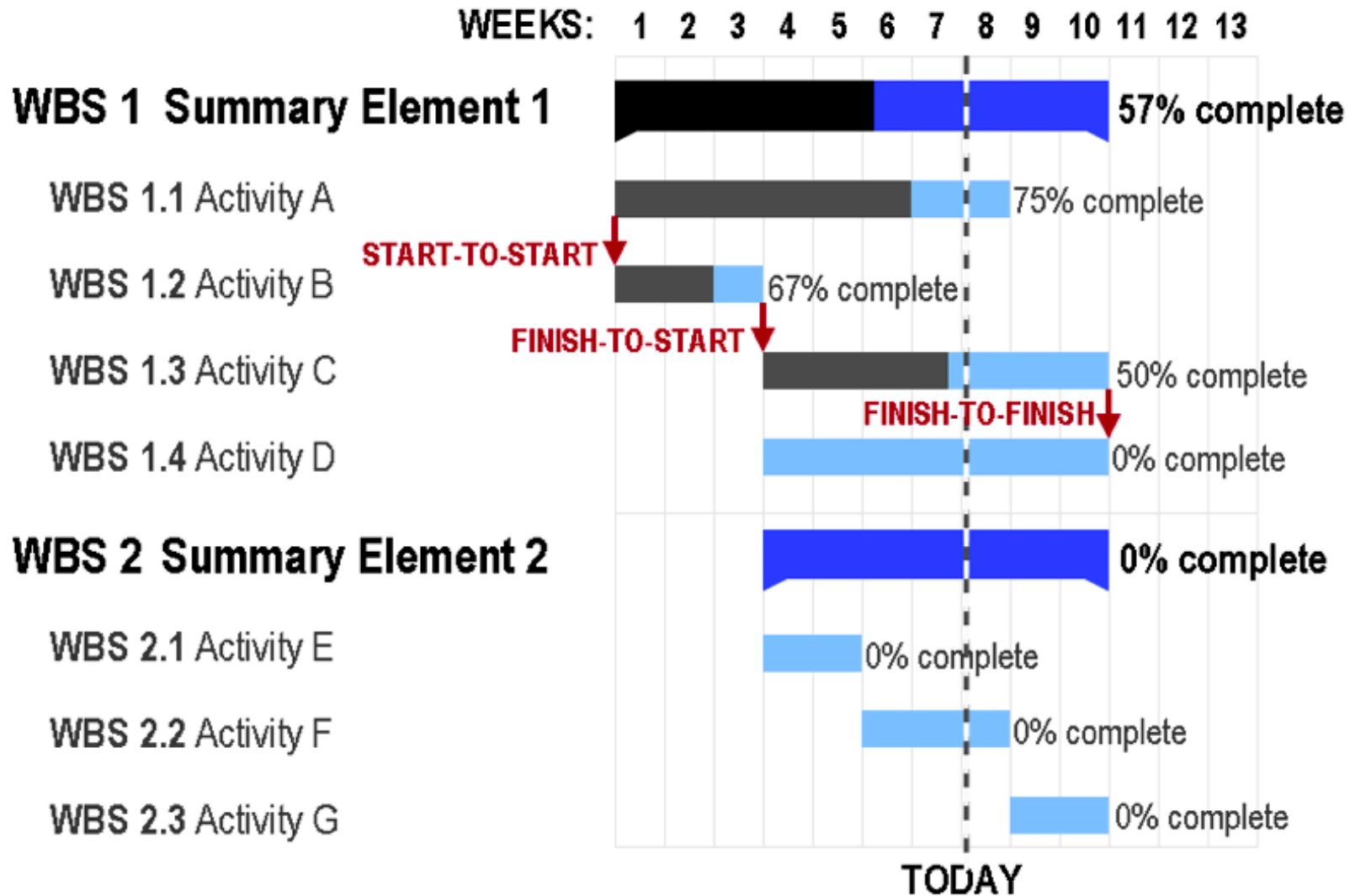
Gantt charts

A Gantt chart is a bar chart to illustrate a project schedule [2]. Elements are :

- work breakdown structure (WBS)
    - summary elements (tasks)
    - terminal elements (sub-tasks)
- start / end dates
- dependencies
- current schedule status

A Gantt chart can be produced with an electronic sheet or specific software, see Gantt project homepage [3], or project management software, list at [4]

Gantt charts - II

A Gantt chart structure, from [2]

Learn from others' experience

Gantt charts are a graphical reminder. Reminders are excellent to motivate and keep you aware of your work progress, but they do not tell :

- How to estimate correctly the time required for a task
- Teach subtle dependencies in research activities
- Predict problems that can hinder your progress
- Organise your work to stick to the schedule
- ...

Learn from others' experience - II Examples

- PhD students that submit in time have the structure of the thesis ready about 8-10 months before the planned date of submission

- A task usually takes about 3 or 4 times longer than the predicted time to be accomplished

- Many tasks are not accomplished at all (too ambitious, too wide scope)

- Checking emails and reading news sometime can take up the whole first year of a PhD before one start feeling under pressure

Splitting long periods in slots

Example

Relations with supervisor and collaborators

Each supervisor has a different style of supervision, different character and attitude towards students

The choice of a supervisor whose style and character are compatible with the student is a key point for a successful PhD

What personality and attitude in a supervisor could be compatible with you or push you to have the best results?

Relations with supervisor and collaborators - II

Supervisors are very busy (but you too), learn to use the time well:

- short communications can be sent by e-mail
- identify the important points to discuss before meetings
- do not delay seeing your supervisor if you are stuck

Supervisor and collaborators - III

"If you can trust yourself when all men doubt you,
But make allowance for their doubting too" ("If", by Rudyard Kipling)

- Collaborators, members of your thesis group, your supervisor, people from the audience at a talk can be very critical towards your work. This is annoying but very useful:

  - take their points into consideration

  - learn to defend your work

- People you work with are also human, they have different personalities, moods, attitudes, ambitions.

➡ Do not take it personally, learn to deal with it and use it to your own advantage

Time management

- Take control of the situation

    "Concentrate on results, not on being busy" [1]

- Beating procrastination

- Activity logs

- To Do lists

Procrastination

Certain tasks are avoided in favour of others we like more or we feel more comfortable doing

Causes :

- The freedom we have to choose which task to carry out first when many need to be accomplished

- The predisposition to like certain tasks more, tendency to do easy things first

- Unconscious fear or uncomfortable feeling in doing certain tasks

See [1] for more on procrastination

Procrastination - II

Symptoms:

- Check your e-mails often and repeatedly
- Sit to start an important task and realise that a cup of coffee would be very good to start with
- A cup of coffee and checking news will relax you before starting a hard job
- Waiting for the "right" mood or the "right" time
- Having items in the To Do list for a long time
- Being always available to help others when they ask
- Think that we are very busy but in the evening, the day after or the week-end we will have more time
- I work well in the evening, even better tomorrow

Procrastination - III

How to get over it

- Recognise it is perhaps the most difficult and important step

- Once procrastination is recognised, one can see the benefit that can derive from tacking the delayed tasks

- Most of tasks that are delayed because of procrastination seem more unpleasant and daunting before dealing with them than when we actually get them done

Activity logs

Write activity logs to keep track of your daily/weekly activity. Useful to:

- Track back the speed of your progress
- Understand what are the tasks that require more time or are more difficult
- Report to the supervisor or collaborators the required time for certain tasks (they might not know or realise)
- Justify to your supervisor, collaborators, or even to yourself, choices based on long/short preliminary studies/experiments etc.

Activity logs - II

- Help observing particular activities that have not being carried out

- Help detecting procrastination

- Give an objective figure on how your time is spent

- **Measure time devoted to work** :

  - If too little: push you to put more effort

  - If it's too much : helps taking week-ends off, holidays

To Do Lists

The best way to concentrate on something is to get distracted from everything else

To Do Lists allow you to :
- insert a long term task and forget (not be bothered) about it for the time being
- associate a priority to tasks
- associate a due date to tasks
- detect tasks that are being procrastinated
- help beating procrastination with the prospect of crossing out persistent and haunting tasks on your to do list

A note...

Don't forget that your MSc or PhD is your
real Research Skills module

Good luck!

References

[1] "Time management",(2007), [online at http://www.mindtools.com/pages/main/newMN_HTE.htm, accessed 20 Nov 2007]

[2] "Gantt charts", Wikipedia (2007), [online at http://en.wikipedia.org/wiki/Gantt_chart, accessed 20 Nov 2007]

[3] "Gantt project homepage" (2007) [online at http://ganttproject.biz, accessed 20 Nov 2007]

[4] "List of project management software" Wikipedia (2007) [online at http://en.wikipedia.org/wiki/List_of_project_management_software , accessed 20 Nov 2007]