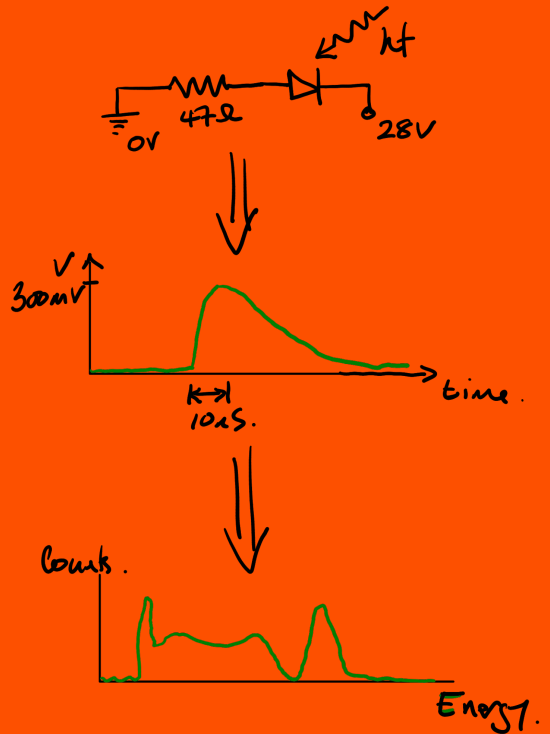
Summer school project

Dr Paul Davies

- Defining projects and examples
- Work breakdown structure
- Gantt Chart
- Summer school project scope



Scope

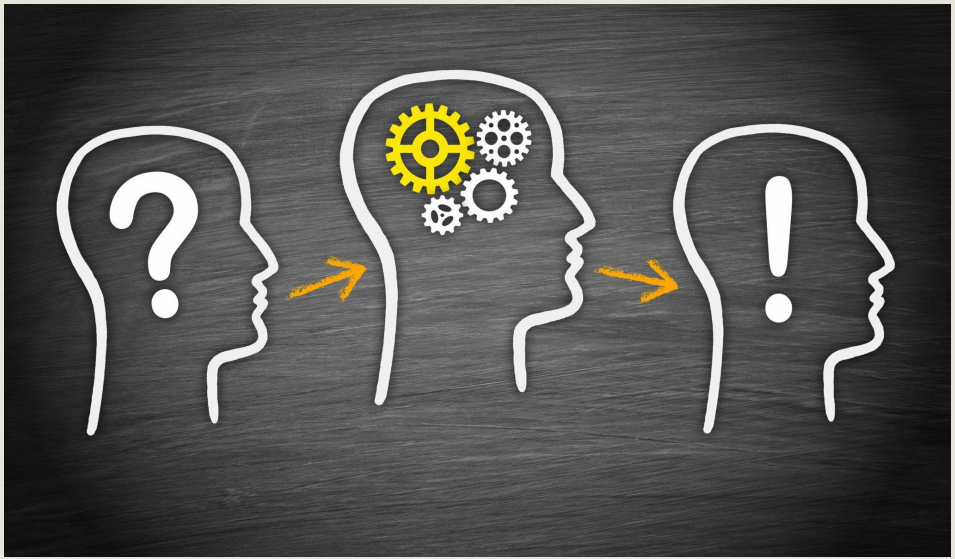
Deliver a summer school project, introduce project planning tools, takes about 16 hours to complete,

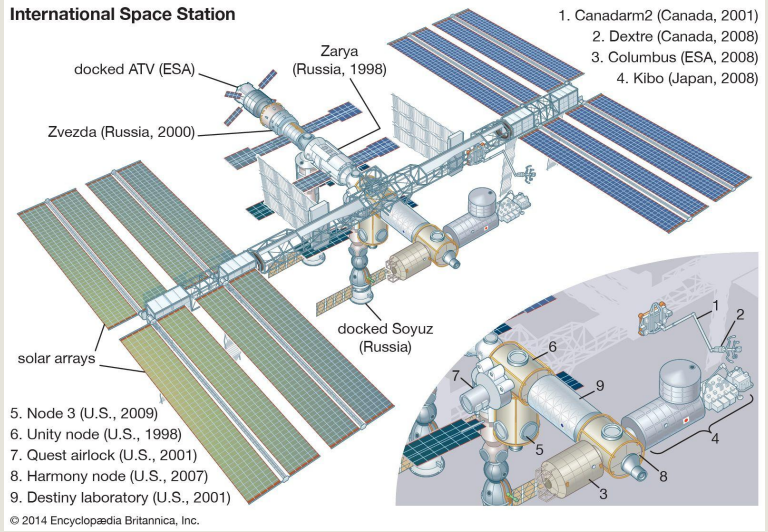
....., for free!

The best detectors from stuff I found in my office

What is a project?

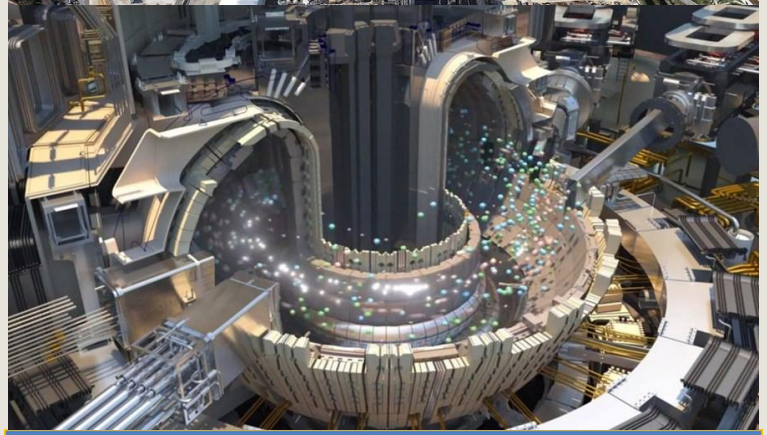
- A project: A temporary endeavor undertaken by an individual or team to create a unique product, service or result.
- Operations: The day-to-day work done to sustain a business.
- Projects end when their objectives have been met or the project is terminated.

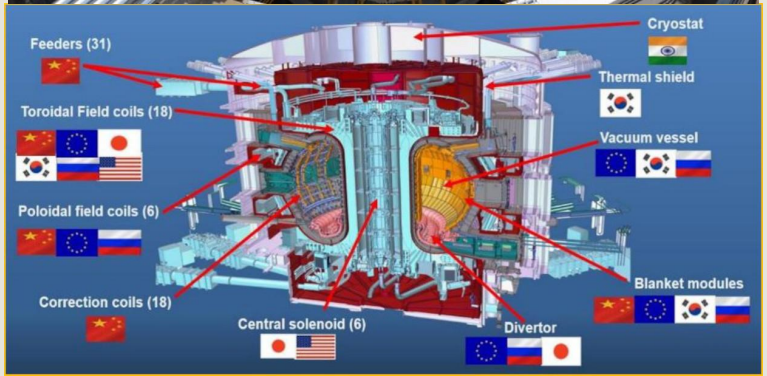




International space station

- Freedom: United States project (1980 - 10 years duration)
- Russia-US collaboration (1993)
- Multinational consortium: Incorporate modules from ESA and Japan
- Fully operational in 2009 (6 crew members)





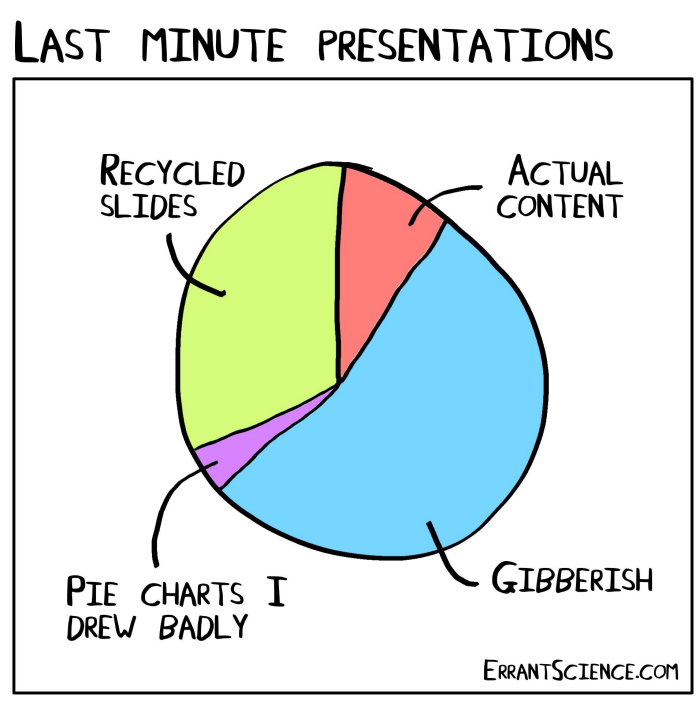
ITER

- Geneva Superpower Summit 1985, initial idea
  - Euratom, Japan, USSR, USA
  - Conceptual design work starts 1998
- Final design approved by all members 2001
- Aix-en-Provence site selected 2005
- Building work starts 2010

Why do you need RPM techniques?

Project need not be very long term.

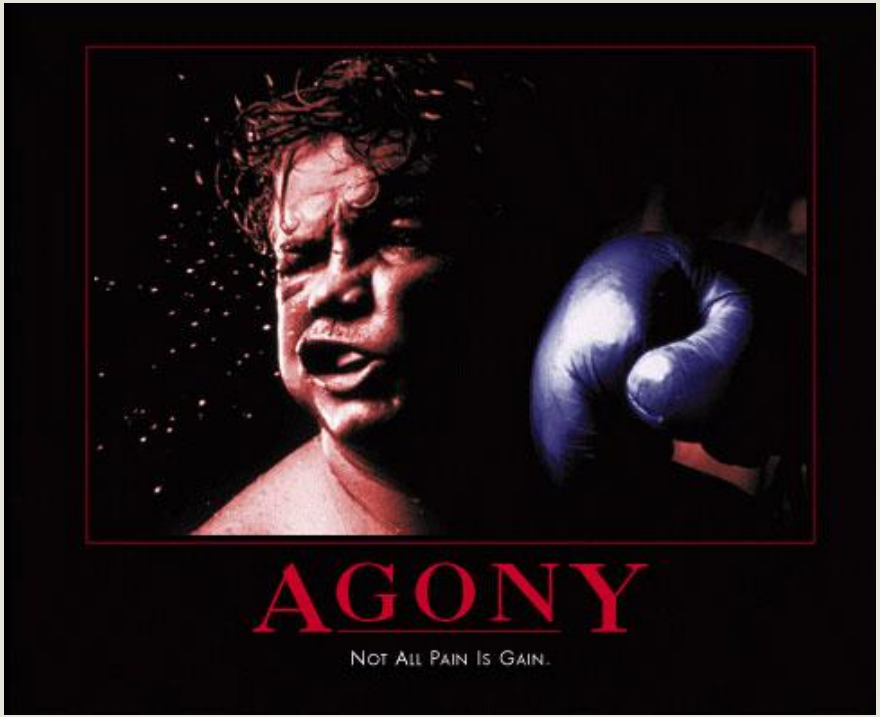
I have a presentation to give in 3 months:



Why do you need RPM techniques?

RPM can reduce the pain

- Higher worked moral (less stress)
- Higher quality outputs
- Increased reliability
- Lower costs
- Reduced completion time

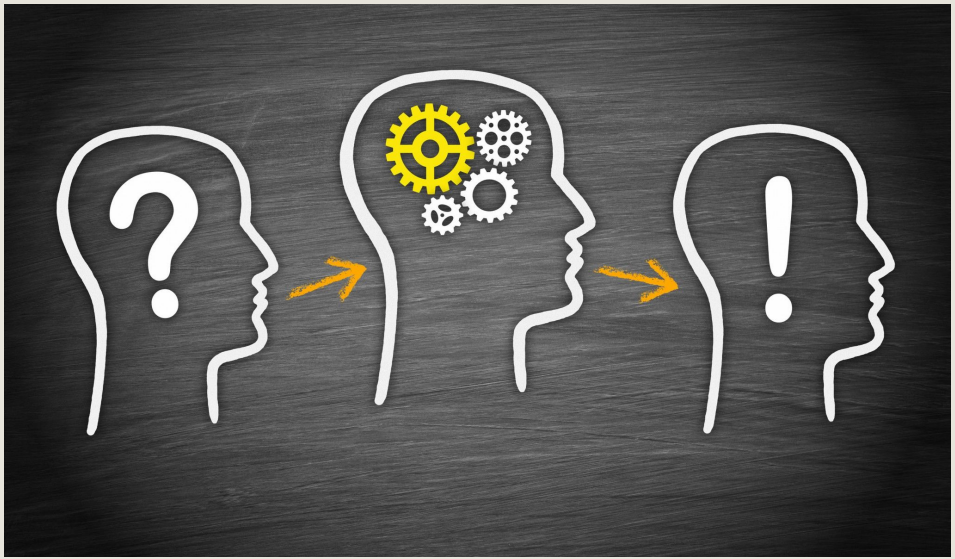


Project management: Definition and Planning

- Define the project scope.
- Identify the deliverables.
- Break the project down into major activities
- Break the activities down into tasks
  - Estimate the duration of tasks
  - Estimate the resource requirements
  - Identify dependencies between tasks
- Draw a provisional project network (your plan)
- Check plan to ensure all activities are covered.

Define the scope

- Each project is unique.
- Projects require a scope:
  - Aims, Objectives, duration, cost, deliverables, ...
- Common sets of tools will help you manage different projects.
- Always starts with a scope:
  - Defines the boundaries, objectives, deliverables, and tasks.
  - What outcomes are expected.
  - What is and (perhaps more importantly) what is not included.



Why define a scope?

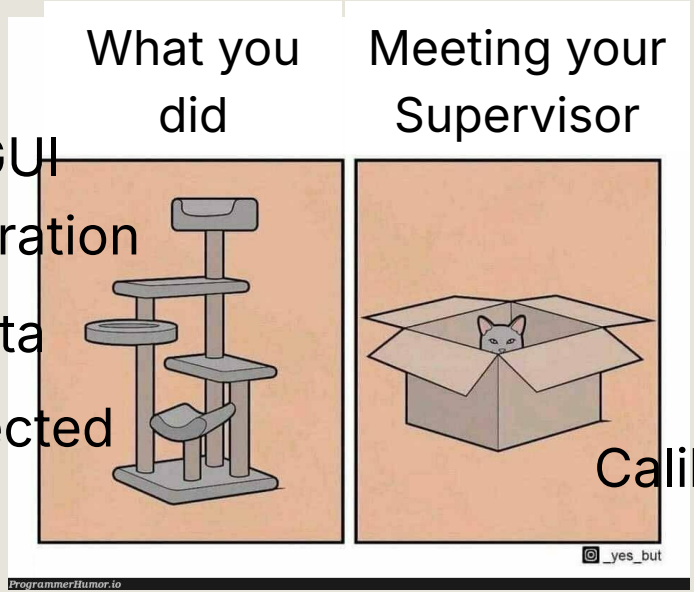
Happens so often it is given a name, Scope Creep

Add a GUI

Automate the calibration

Calibrate data

Data collected

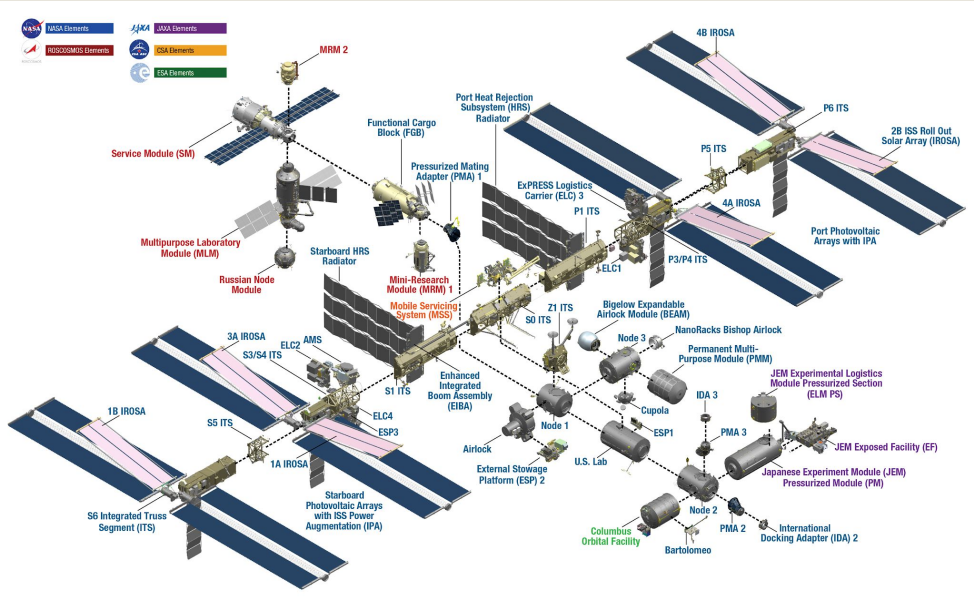


Calibrated spectrum

Project attributes

- Developed using progressive elaboration
  - Start with a broad definition and develop more clarity over time
- Requires resources, often limited
  - People / Hardware / Software / Money
- Should have a primary customer or sponsor
  - Provides direction and support
- Involved risk and uncertainty
  - Can the objectives be well defined, resources identified, money allocated, external factors?

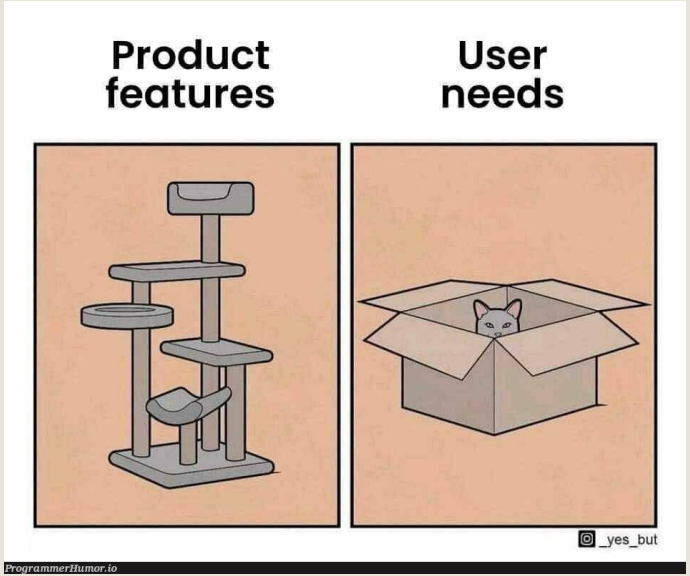
Work Breakdown Structure (WBS)

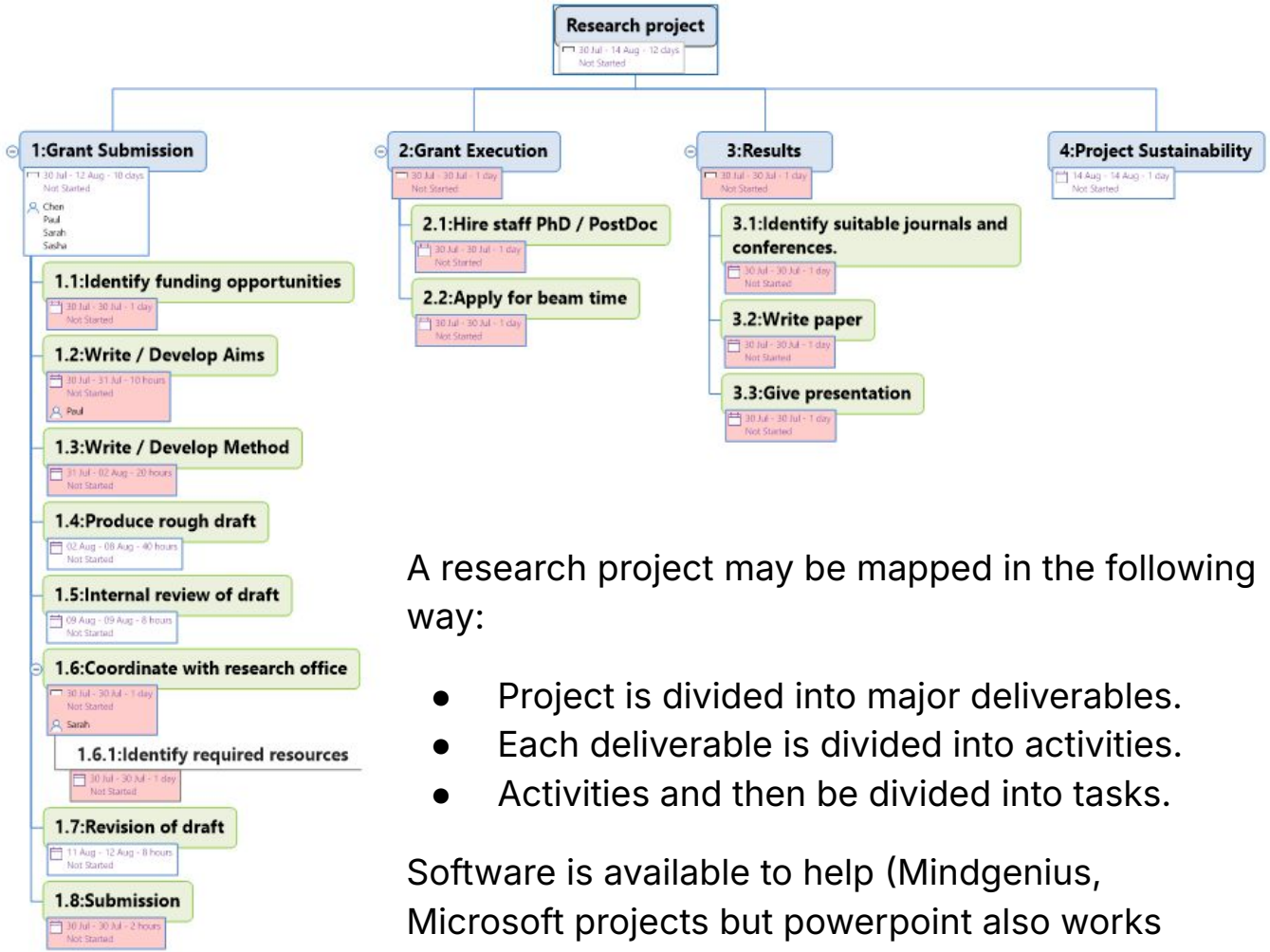


Systematic way to break a project down into smaller and more manageable components, helps to organize and when presenting project information in a logical way.

Work Breakdown Structure (WBS)

- To create a WBS, we need a hierarchical decomposition of ALL of the deliverables for the project.
- Aids in defining and controlling the scope of a project.
- Ensure there is a common understanding of the project scope.
- Serves as a basis for the project planning and resource estimation.
- If it is not in the WBS to doesn't happen!





A research project may be mapped in the following way:

- Project is divided into major deliverables.
- Each deliverable is divided into activities.
- Activities and then be divided into tasks.

Software is available to help (Mindgenius, Microsoft projects but powerpoint also works well).

Gantt Chart

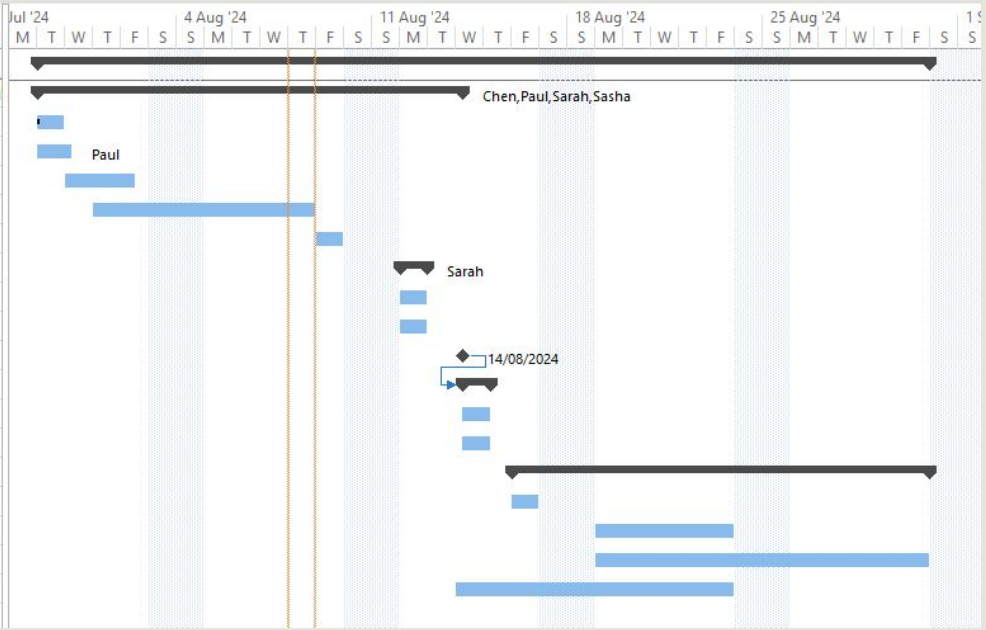
- A graphical representation of the tasks and their dependencies within a project.
- Lots of popular tools to help, some will construct from your WBS.
- Key steps in creating your Gantt chart
  - Identify tasks: Make sure all tasks in your WBS are included in the project plan.
  - Determine constraints: Completion dates, total time allocated to a single person
  - Determine dependencies: Which tasks depend on other tasks, Is there any lag/lead time?

Key steps in constructing Gantt chart

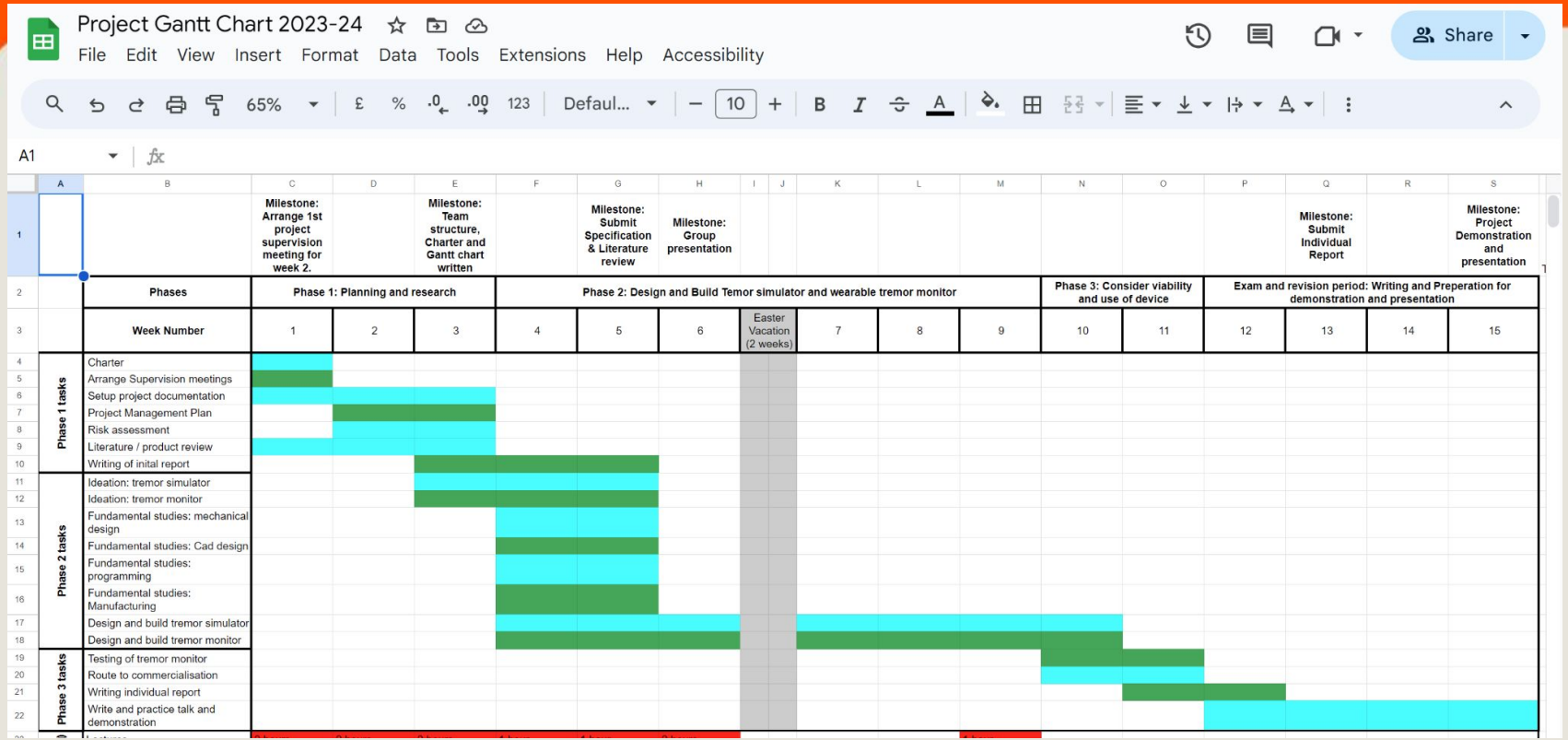
- Build a logical structure.
- Allocate resources, identify the people, understand sequence of task, schedule all tasks.
- Establish duration and dependencies for each task.
- Use a template or software to create the chart. Typically,
  - Rows are activities / tasks
  - Columns are time
  - Don’t forget people don’t work weekends!!
- Add milestones.
- Use colour coding.

Gantt Chart

Task Name	Duration	Start	Finish	% ...	P...	Resources
Research project	**24 days**	**30/07/2024**	**30/08/2024**	**0%**		
Grant Submission	**11.25 days**	**30/07/2024**	**14/08/2024**	**1%**		**Chen,Pau**
Identify funding opportunities	1 day	30/07/2024	30/07/2024	10%		
Write / Develop Aims	10 hours	30/07/2024	31/07/2024	0%		Paul
Write / Develop Method	20 hours	31/07/2024	02/08/2024	0%		
Produce rough draft	48 hours	01/08/2024	08/08/2024	0%		
Internal review of draft	8 hours	09/08/2024	09/08/2024	0%		
Coordinate with research office	**1 day**	**12/08/2024**	**12/08/2024**	**0%**		**Sarah**
Identify required resources	1 day	12/08/2024	12/08/2024	0%		
Revision of draft	8 hours	11/08/2024	12/08/2024	0%		
Submission	10 hours	13/08/2024	14/08/2024	0%		
Grant Execution	**1 day**	**14/08/2024**	**15/08/2024**	**0%**	**11**	
Hire staff PhD / PostDoc	1 day	14/08/2024	15/08/2024	0%		
Apply for beam time	1 day	14/08/2024	15/08/2024	0%		
Results	**11 days**	**16/08/2024**	**30/08/2024**	**0%**		
Identify suitable journals and conferences.	1 day	16/08/2024	16/08/2024	0%		
Write paper	5 days	19/08/2024	23/08/2024	0%		
Give presentation	10 days	19/08/2024	30/08/2024	0%		
Project Sustainability	8 days	14/08/2024	23/08/2024	0%		



Spreadsheets work well for gantt charts



Your project brief

Create an energy spectrum from a LaBr3 detector signal:

- A project specification
  - Aims and objectives
  - Project plan (WBS and Gantt chart)
  - Results
- Presentation (5 minutes) Sunday.

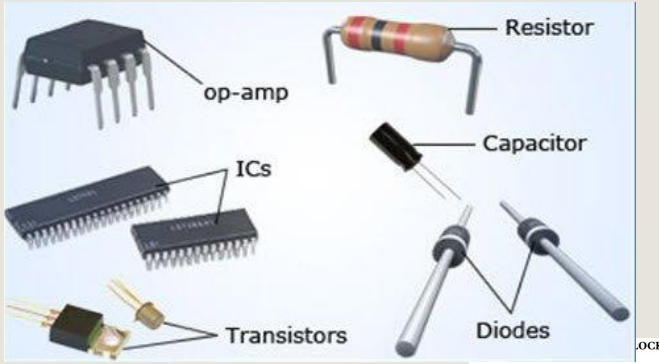
Resources,

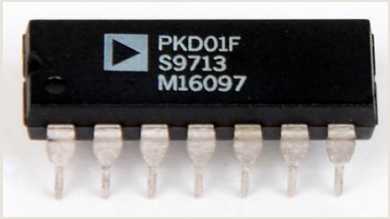
- 5 team members
- 2 hours per day for 5 days
- Some components and lab equipment

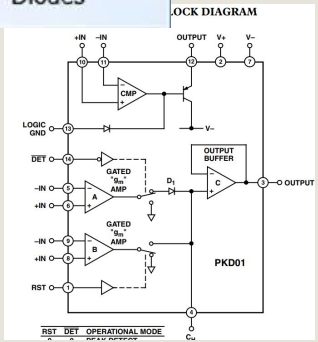
Constraints,

- 1 hour blocked for lecture.
- Basic lab equipment, limited components
- 2 working detectors for 10 groups.

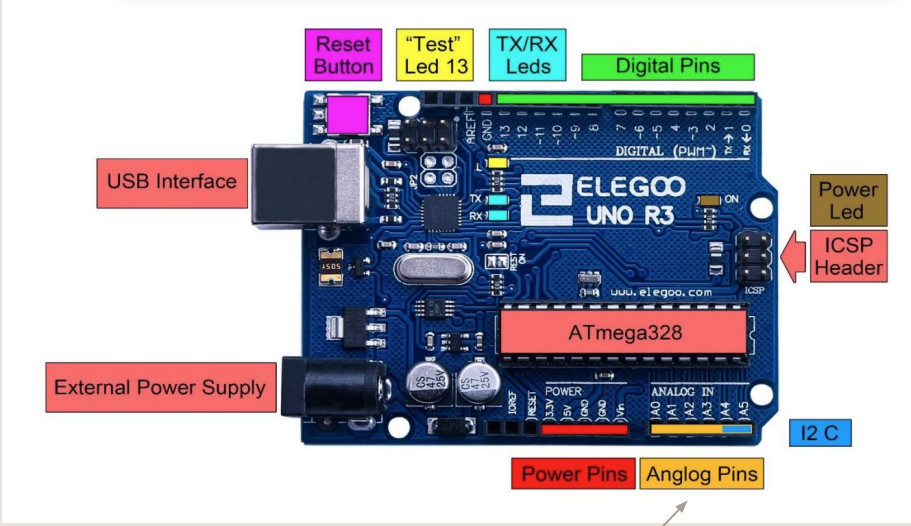
Available components





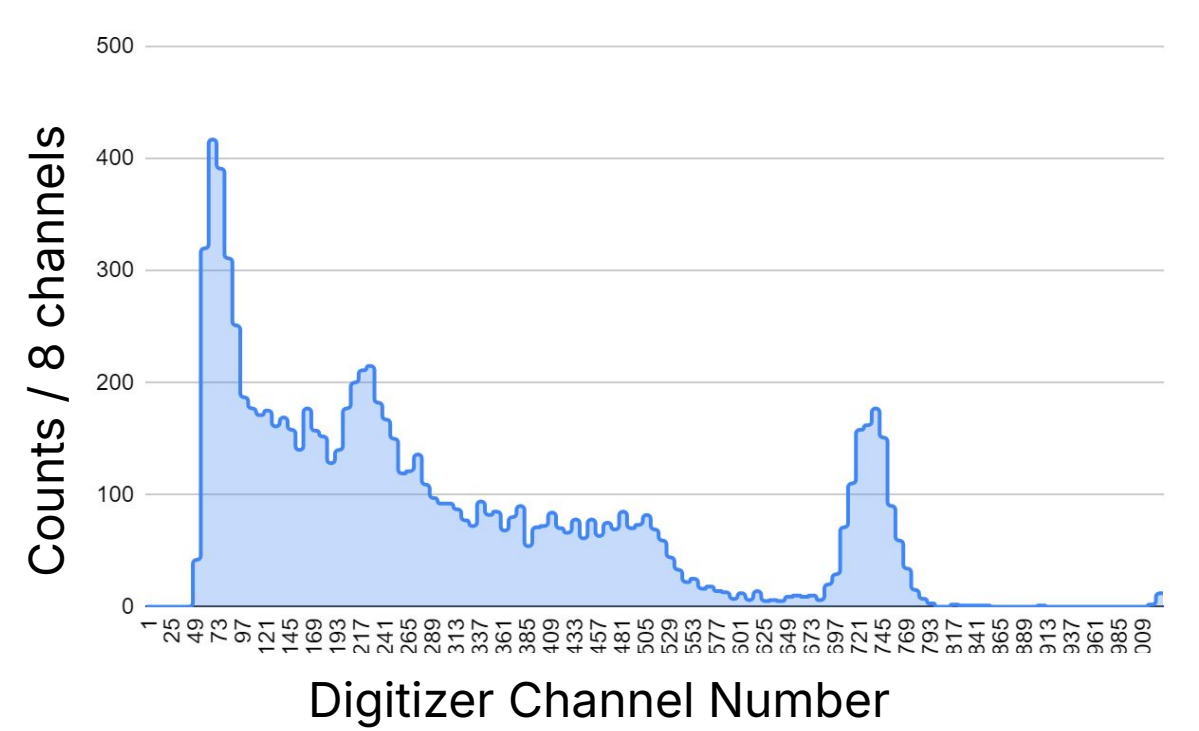


PWM output, 0 to 5 V output



Input: -0.4 to 5 V
Small currents, 10 bits

Best result: CsI, 5x5x25mm, Cs-137



Summary: What you are doing!

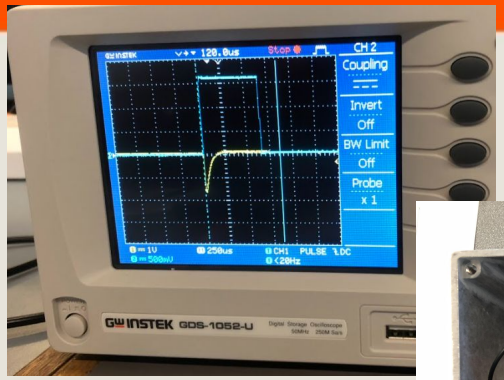
Define your scope

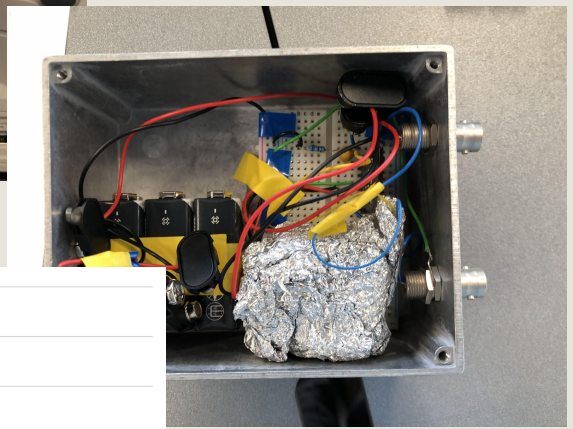
List your deliverables

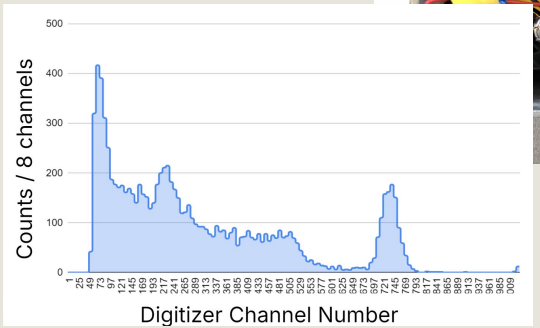
Break down the work

Produce a plan

Create an energy spectrum for LaBr3







Risk Management

What is a (technical) risk?

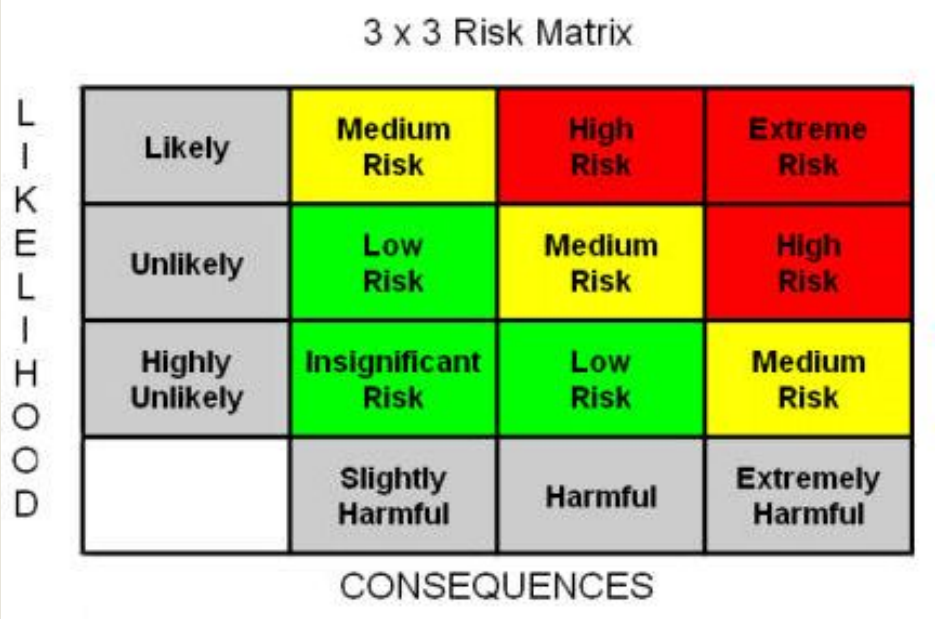
An event(s) that:

- May occur
- but is not certain
- and would impact on the project outcomes (typically the quality, cost, time).
- We will look at two metrics:
  - Likelihood
  - Impact

Examples

- Uncertainty in the outcome (experiments go wrong).
- Uncertainty in design.
- Single source components.
- Errors in specification.

Risk matrix



Likelihood (probability)	Consequences (impact)
3. Likely	3. Extremely harmful
2. Unlikely	2. Harmful
1. Highly unlikely	1. Slightly harmful

Score 1 - Insignificant Risk, No action is required.

Score 2 - Low Risk, Largely acceptable, subject to reviews periodically or after significant changes etc.

Score 3 or 4 - Medium Risk, Efforts should be made to mitigate the risk.

Score 6 - High Risk, Work activities should not be started until the risk has been mitigated.

Score 9 - Extreme Risk, Work should not be started or continued until the risk has been mitigated.

Risk Priority Matrix

- 3-by-3 matrix shown but more granularity is possible.
- For 3-by-3 a score of 1, 2 or 3 allocated for likelihood and impact. These are multiplied to get the overall risk score.
- Relative importance of categories can be colour coded / captured assigning a subjective meaning the sectors of the grid.

Resolution

- Avoidance
  - Consider alternative approaches that avoid the risk.
- Control
  - Develop a risk reduction plan to manage the impact
- Acceptance
  - Accept the risk and continue
  - Actively plan and agree contingency budget to handle risk
- Transference
  - Pass the risk onto another programme element, person or organisation.

Example

Risk	Probability	Impact	Score	Management
Detectors don’t arrive at the lab in time for testing.	2	3	6	**Control**: Speak with supplier about development time, ensure shipping in timely fashion. **Acceptance**: Allocate additional budget for faster shipping.
Experimental failure	3	3	9	**Acceptance**: Identify lower risk options as a contingency.

Brand theme

How to use

These are example slides, but they're all available in a range of colours. Just right-click your chosen slide and select 'apply layout'.

For image layouts, click on the icon to add your chosen image from Google or your computer.

Tips

- Use the brighter colours sparingly for impact
- Use this neutral background for longer text
- Try these combinations:
  - Grey and dark blue
  - Light and dark green
  - Orange and yellow
  - Purple and dark green
- Ensure you test the accessibility of your presentation using Grackle Docs

Title

100

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Add a bold

message

Subtitle

Text

- List item 1
- List item 2
- List item 3

Subtitle

Text

- List item 1
- List item 2
- List item 3

Subtitle

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Add a bold

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Title

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- List item 1
- List item 2
- List item 3

Instruction or section title

Url or call to action