



MANAGING PROJECTS

with Eddie

CONTENTS

- Definition/motivation
- Triple constraint
- Project phases
- Stakeholders
- Work breakdown structure
- Reviews
- Risk & Opportunity
- Tools & Resources

Note: all of this is open to pragmatism and personalisation

DEFINITION/MOTIVATION

A **project** is a temporary endeavor undertaken to create a unique product, service, or result.

Project management is the practice of initiating, planning, executing, controlling, and closing the work of a team, to achieve the specific goal(s) of the project and meet specific success criteria within a specified timeframe.



TRIPLE CONSTRAINT



TRIPLE CONSTRAINT



COST

- Budget/cost is the amount of money the project has to spend.
- Project cost estimation and tracking is essential.
- Ways to estimate project costs are:
 - **Historic Data:** Using the costs of similar projects for comparison.
 - **Resource Costs:** Determining the rate of cost for goods and labour by unit.
 - **Bottom Up:** Estimating from the lowest- to the highest- level work package.
 - **Parametric:** Measure relationship between historic data and other variables.
 - **Vendor Bid:** Average of some vendor bids on project.
 - **Reserve:** Aggregate cost of activities.
 - **Quality Analysis:** Estimate cost of highest quality for activities.

SCOPE

The scope is the objective of the project.

The goals of a project should be clearly agreed and defined early in the project.

Beware of scope creep...



SCOPE



TIME

Time/schedule is the duration allotted to complete the project.

Steps to manage the schedule :

- **Plan Schedule Management:** Create policies/procedures for planning/monitoring schedule
- **Define Activities:** Identify and document actions.
- **Sequence Activities:** Identify and document the logical order of activities.
- **Estimate Activity Resources:** What type and how many resources needed?
- **Estimate Activity Durations:** Time to complete each activity with the resources estimated.
- **Develop Schedule:** Analyze activity, duration, resources and timeline to develop a schedule.
- **Control Schedule:** Compare planned schedule to actual progress to determine if your project is on track.

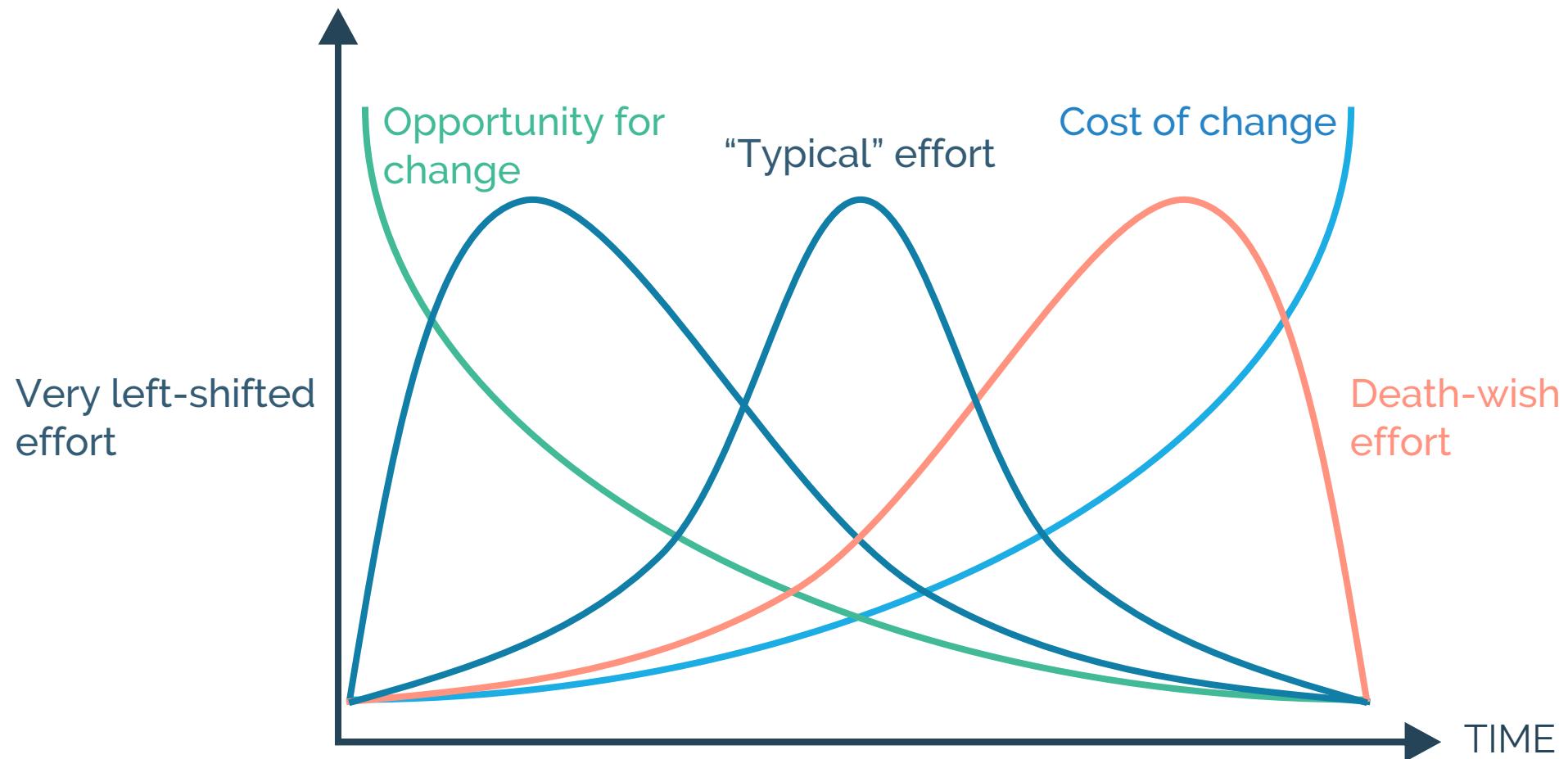


PROJECT LIFECYCLE

PROJECT LIFECYCLE/PHASES

Concept	Initiation	Planning	Implementation	Delivery	Close
<ul style="list-style-type: none">○ High level feasibility○ High level requirements○ Risk analysis○ Identify key performance indicators (KPIs)○ Identify stakeholders	<ul style="list-style-type: none">○ Identify resources○ Identify stakeholders○ Develop scope○ Develop schedule○ Risk analysis	<ul style="list-style-type: none">○ Objectives○ Schedule○ Budget○ Work breakdown structure○ Risk management	<ul style="list-style-type: none">○ Ongoing planning○ Build/develop○ Test○ Risk management○ Review	<ul style="list-style-type: none">○ Review○ Handover	<ul style="list-style-type: none">○ Review○ Lessons learned○ Store documentation

LEFT SHIFT



LEFT SHIFT

Principles of left-shift are:

- Upfront planning
- Early definition of objectives/goals/needs
- Early testing
- Risk analysis
- Reviews

LEFT SHIFT





STAKEHOLDERS

STAKEHOLDER ANALYSIS

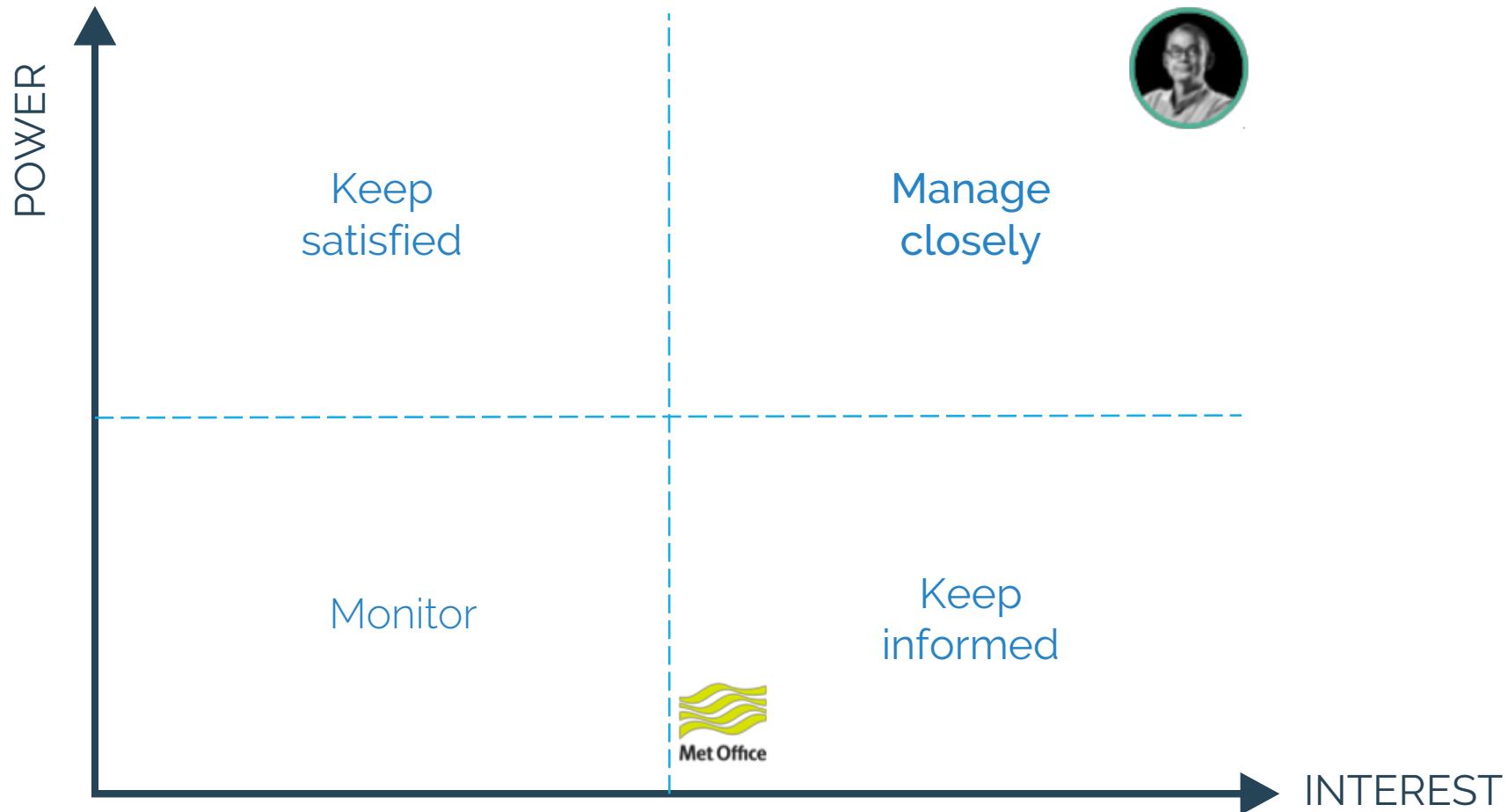
A stakeholder is an individual, group or organization who is **impacted by** or **can impact** the outcome of a project.

They should:

- be identified.
- Their contact details should be registered.
- Identify their power & interest in the project.
- A communication/engagement strategy should be defined.
- Additional info: organization/expertise/expectations/unique facts.

ID	Stakeholder	Role	Contact details	Power	Interest	Engagement/comms strategy
1	Bill Chaplin	PhD supervisor	w.j.chaplin@bham.ac.uk	High	High	Weekly meetings
2	MetOffice	Partial funder	TBD	Low	Medium	< annual updates will suffice

STAKEHOLDER ANALYSIS



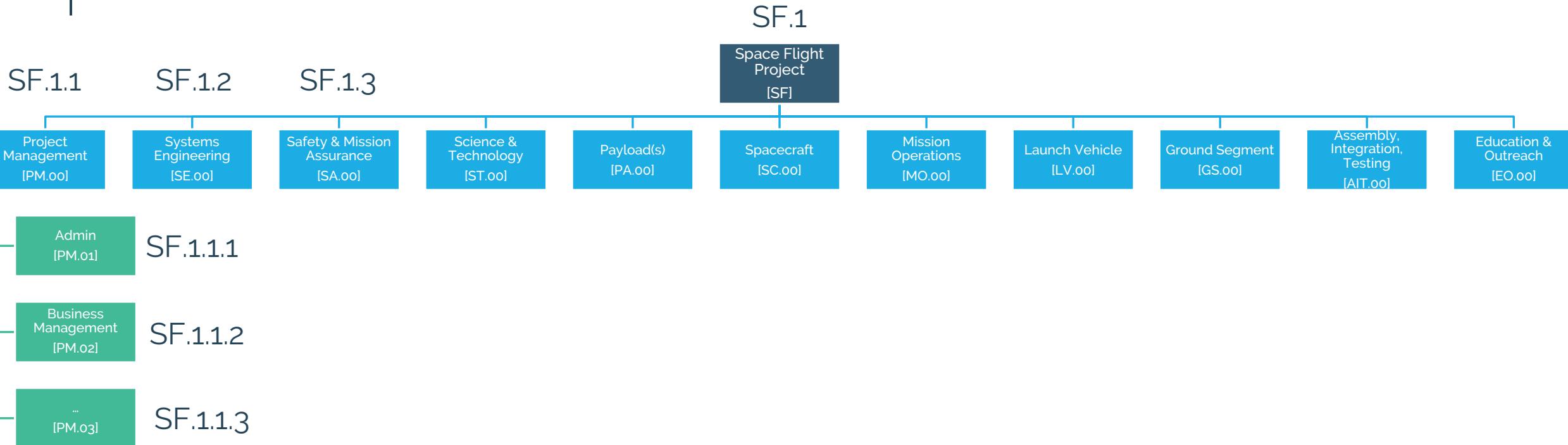


WORK BREAKDOWN STRUCTURE (WBS)

WORK BREAKDOWN STRUCTURE

- A WBS is a hierarchical breakdown of the elements involved in the project.
- The WBS is a useful tool for **organizing** the **structure** of a project and aiding planning.
- These may be functional, or organizational.
- The WBS is inherently linked to the assignment of “**work packages**” (WP).
- Similar breakdown structures can be applied to other project aspects, e.g. cost

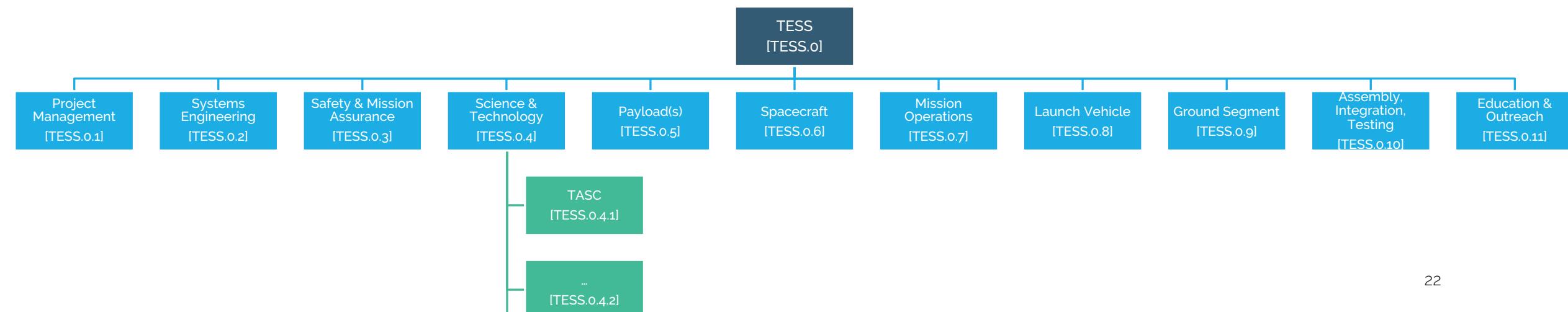
WBS



EXAMPLE: TESS/TASC

The TASC working groups are fulfilling work packages of the NASA TESS WBS.

TASC working groups were set up with specific tasks to be completed within specific point within the TESS mission.



EXAMPLE: TESS/TASC

The TASC working groups are fulfilling work packages of the NASA TESS WBS:

- **WGo**: TASOC – Basic photometric algorithms / TASC data products
- **WG1**: Asteroseismology of TESS exoplanet hosts
- **WG2**: Oscillations in solar-type stars
- **WG3**: Oscillating stars in clusters
- **WG4**: Main Sequence AF "classical" pulsators
- **WG5**: Main Sequence OB "classical" pulsators
- **WG6**: RR Lyrae stars and Cepheids
- **WG7**: Red Giant oscillations
- **WG8**: Compact pulsators



REVIEWS

REVIEWS

Reviews are a thorough **examination** of the (technical) **status** of the project performed at crucial project milestones.

Often a project phase will end with a review, but a review may be initiated at any point within the project lifecycle where necessary.

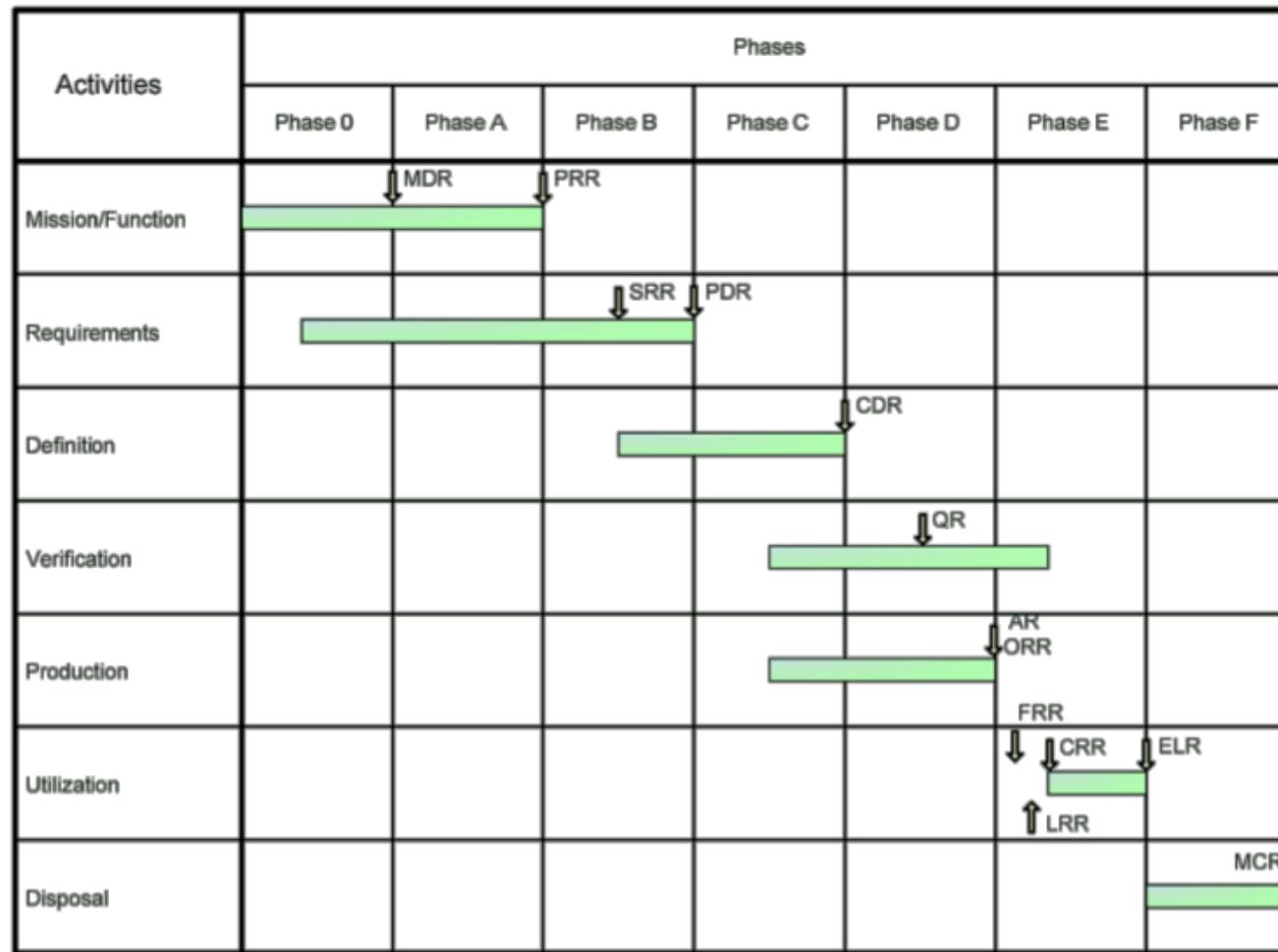
Effective reviews will look at:

- Review objectives
- Documentation
- Budgets
- Risk

Effective reviews will produce:

- Review item discrepancies (RIDs)
- Actions

REVIEWS





RISK & OPPORTUNITY

RISK

Risk management is fundamental in order to be pro-active, rather than re-active.

Over the lifecycle, risk will disappear and new risks will emerge, so risk management is an **iterative process**.

PESTLE acronym is a good way to identify some unknown risks:

- P - Political
- E - Economic
- S - Sociological
- T - Technological
- L - Legal
- E - Environmental

You can manage risks using a risk register.

RISK REGISTER

Likelihood - How likely is that the risk will occur. Can be 1- 5 or High / Medium / Low

Impact - What will the impact be if the risk occurs.

Severity - Likelihood x Impact

Mitigating action - Actions that can be taken to reduce the likelihood of the risk occurring.

Contingent action - What will be done if this risk does occur. Usually actions to reduce the impact.

Status - For example Open, Waiting, Closed, in Progress etc.

ID	Date raised	Risk description	Likelihood	Impact	Severity	Owner	Mitigating Action	Contingent action	Progress	Status
1	1/11/19	Lack of funds	Low	High	Amber	E. Ross	Agree budget and payment schedule	Open piggy bank		Open
2										

OPPORTUNITY

Risks do not always have a negative impact, and may be positive opportunities.

It is worthwhile managing opportunities as well as risks.

Opportunities can be managed using an opportunity register, which is very similar to a risk register and they can often be combined.

Opportunity management is generally less easy to conduct and is arguably less useful.

OPPORTUNITY REGISTER

Likelihood - How likely is that the opportunity will occur. Can be 1- 5 or High / Medium / Low

Impact - What will the impact be if the opportunity occurs.

Benefit - Likelihood x Impact

Initiating action - Actions that can be taken to increase the likelihood of the opportunity.

Occurrence action - What will be done if this opportunity does occur. Usually actions to increase the impact.

Status - For example Open, Waiting, Closed, in Progress etc.

ID	Date raised	Opportunity description	Likelihood	Impact	Severity	Owner	Initiating action	Occurrence action	Progress	Status
1	1/11/19	Google buy-out	Low	High	Amber	E. Ross	Email google	Crack out the champagne		Open
2										



TOOLS & RESOURCES

KEY PERFORMANCE INDICATORS

A key performance indicator (KPI) is a **quantifiable measure** used to evaluate the success of a project through its lifecycle.

Good KPIs are usually S.M.A.R.T. (specific, measurable, achievable, realistic, timely)

Some examples include:

- No. tasks completed
- Budget
- Revenue
- Open issues

DOCUMENTATION

It can be useful to make a **project management plan** to define the Ws & Hs (what, why, how, how much, etc.)

Keeping a coded documentation structure is useful in project management to keep track of a document's function at a glance, e.g.:

PPP-TTT-XXX

(PPP = project ID, TTT = doc type*, XXX = doc #)

PBJ-RP-001

(PBJ = PBJam, RP = PL, 001 = 1st doc made in proj.)

Documents can be tracked using a document register / document library to help organization.

*document type examples:

- RP = report
- PL = plan
- LI = list

DASHBOARDS

Dashboards can be a really quick way of checking on budgets or key performance indicators of a project.

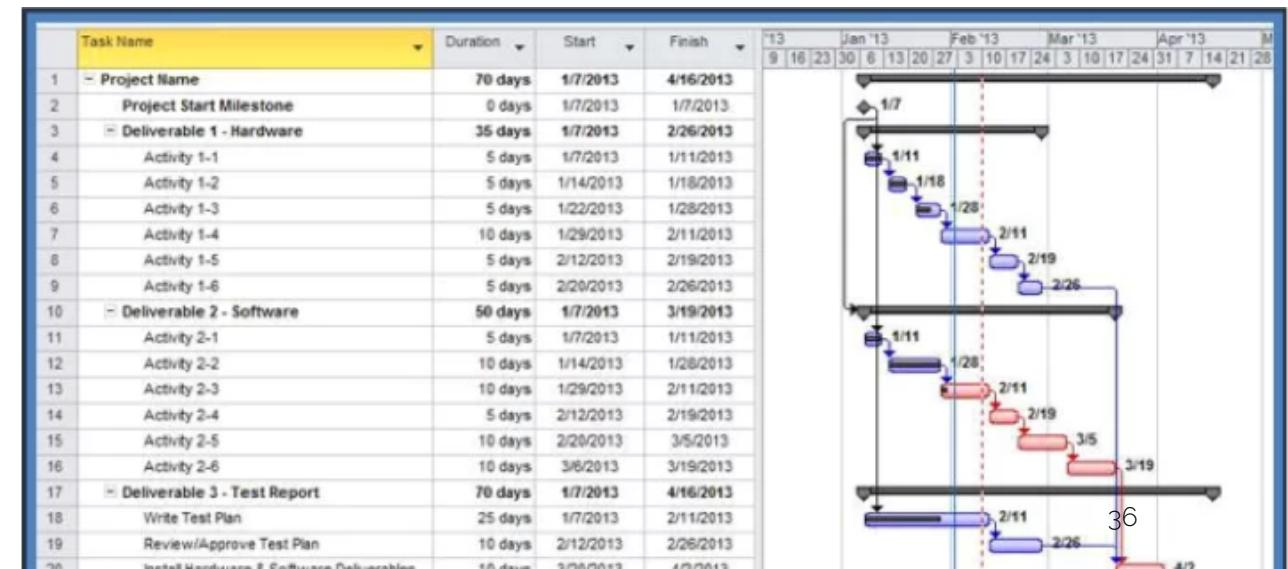
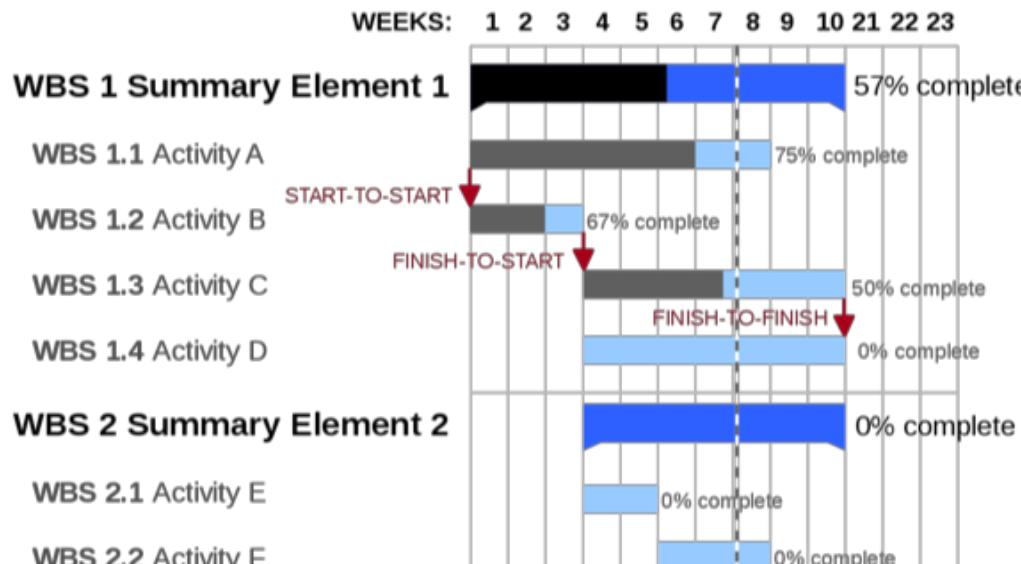
Again, you can pay or make them...



GANTT CHART

Gantt charts are a widely used, visual way of managing the timeline of projects.

Many software packages exist for creating complicated Gantt charts with relationships and dependencies between activities.



GANTT CHART

It is also possible to make an in-depth Gantt chart in excel with a little bit of patience...

WBS	Project	Start Date	End Date	Y1				Y2				Y3				Y4			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1.1				TBC	TBC														
	1.1.1			TBC	TBC														
	1.1.2			TBC	TBC														
	1.1.3			TBC	TBC														
1.2																			
	1.2.1			TBC	TBC														
	1.2.2			TBC	TBC														
	1.2.3			TBC	TBC														
	1.2.4			TBC	TBC														
1.3																			
	1.3.1			TBC	TBC														
	1.3.2			TBC	TBC														
	1.3.3			TBC	TBC														
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	1.4.4			TBC	TBC														
1.5																			
	1.5.1			TBC	TBC														
	1.5.2			TBC	TBC														
	1.5.3			TBC	TBC														
	1.5.4			TBC	TBC														
1.6																			
	1.6.1			TBC	TBC														
	1.6.2			TBC	TBC														
	1.6.3			TBC	TBC														

ADDITIONAL RESOURCES

- ECSS standard for management (notably: ECSS-M-ST-10C)

 European Cooperation for Space Standardization

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STANDARDS

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Active Management standards

The following standards can be downloaded in PDF or MS Word format.

The European Space Agency hereby disclaims any liability for use of these electronic documents and assumes no responsibility for any error or omission therein. See the [License agreement – Disclaimer](#) for more information.

1. ECSS-M-70A – Integrated logistic support (19 April 1996)
2. ECSS-M-ST-10-01C – Organization and conduct of reviews (15 November 2008)
3. ECSS-M-ST-10C Rev.1 – Project planning and implementation (6 March 2009)
4. ECSS-M-ST-40C Rev.1 – Configuration and information management (6 March 2009)
5. ECSS-M-ST-60C – Cost and schedule management (31 July 2008)
6. ECSS-M-ST-80C – Risk management (31 July 2008)

ADDITIONAL RESOURCES

- NASA Space Flight Program & Project Management Handbook
(NASA/SP-2014-3705)



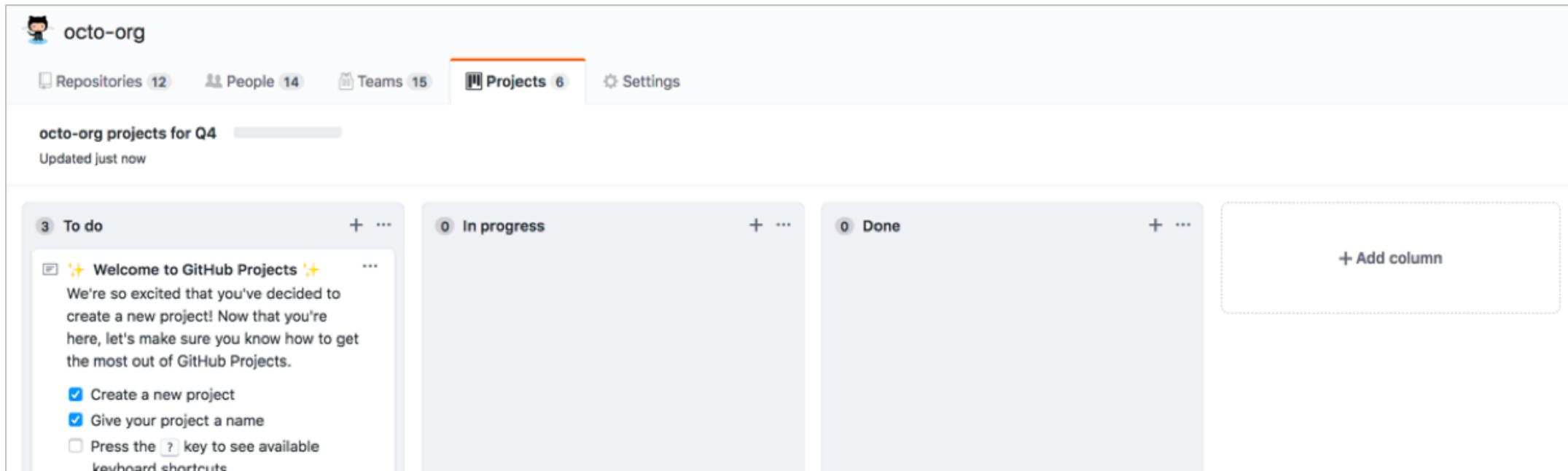
ADDITIONAL RESOURCES

- UoB POD offers a 'Project Management Principles' course. Go to:
<https://intranet.birmingham.ac.uk/staff/development/>



GITHUB PROJECT BOARDS

- GitHub has a built-in project board feature to help you organize and prioritize your work.
 - <https://help.github.com/en/github/managing-your-work-on-github/about-project-boards>





DISCUSSION

Thanks!