

Lesson 1: Project Lifecycle & RMAs as Professionals in the Project lifecycle

Learning outcomes:

LO#1 - The student knows how to identify the activities in the light of the project objectives, outputs, main tasks, performance criteria and resource requirements set in the proposal.

LO#2 - The student will identify the RMA professional roles involved directly and indirectly in post award project management

The Education and Research ecosystem has been in rapid evolution during the past two decades, critically influenced by 'demands of contemporary environments' such as (i) globalization and increased mobility; (ii) global financial crisis; (iii) technology advancement; and (iv) knowledge-based economy (Chan et al, 2017). In response, education and research institutions have been implementing structural changes and enhancing the professionalization of their managing structures (Whitchurch, 2008), aiming at better adapting to these new challenges in an increasingly complex research ecosystem. In fact, Research & Innovation (R&I) needs not only excellent researchers, but also highly-skilled professionals working in research administration, research management, knowledge transfer and exploitation, science communication, research governance and research policy to release the full potential of R&I at institutional, national and international levels. Even though these professionals do not perform direct research tasks, they support researchers in common working ecosystems. These professionals are **Research Managers and Administrators (RMAs)**.

Research Managers and Administrators: diversity and definition

Collinson (2006) highlighted the several common features of the professionals working in research management in British Higher-Education Institutions (HEIs), such as: the i) the wide range of roles; ii) the cross-boundary interaction with academics, and iii) "occupational identity issues". These thin boundaries between academics and non-academics and new identities within HEIs were also evidenced by Whitchurch (2008) who proposes the term "third space professionals" to individuals that perform managing roles, with a diversified background and a non-academic contract, that undertake activities between the professional and academic spheres. A second type of space is defined by Shelley (2010) as the "shifting area", highlighting the shared space where the research management field crosses into the academic domain. Santiago et al (2006) had previously defined the increasingly specialized role of these professionals as 'being able to define missions, objectives and strategies; having capacity to manage financial and human resources and to assume strong management leadership, in contrast to traditional academic styles of negotiation and consensus building'. More recently, Agostinho et al (2020) propose the term "Professionals at the Interface of Science" (PIoS) as an umbrella identity that encompasses all these roles and profiles of professionals.

Despite the different terminology and conceptual framework proposed to define these professionals, all authors acknowledge that research managers and administrators (RMAs) operate at these different levels/ stages of research development:

- *upstream of research* – to attract/advocate for/ define strategy for research funding, projects and partnerships (with both academia and industry);
- *during the research* – to support the research activity itself (e.g. post-award management, technological platform management, ethical compliance management, intellectual property management);
- *downstream of research* – broadening the impact of research (e.g. outreach, science communication, facilitating the impact on understanding, learning & participation; creativity, culture and society; social welfare; commerce & economy; public policy, law & services; health, wellbeing & animal welfare; production; the environment; practitioners & professional services).



This Module focuses on the Project life cycle and on the RMAs that perform project management tasks, often called R&I Project Managers.

R&I projects management

R&I projects are based on activities with a high level of complexity and interdependency and are normally time, resources and money consuming. More frequently than not, there is a high risk and a level of uncertainty associated to these type of projects, so the management of R&I is of a utmost relevance to the success of a R&I project (Mikulskienė, B. 2014; Dinsmore, P. & Cabanis-Brewin, J. 2011). Management processes allow us to deal and control the activities and team members in order to successfully develop a project. R&I management's most important matter is the ability to control the tasks development and effectiveness and efficiency with which the R&D activities are undertaken and how uncertainties are addressed.

In order to understand what implies R&I management and how to better use its techniques, we must understand the meaning of R&I effectiveness (how can we evaluate it) and what are the benefits that can result from R&I management addressed (Szakonyi, R. 1994; Mikulskiené, B. 2014).

Szakonyi (1994) identified 10 R&I activities that allows us to measure the R&I effectiveness:

1. Selecting R&I – without recognising and identifying the R&I projects that better suits our organization perspectives and specializations, any concerns about the project management process are unwarranted;
2. Planning and managing project – a R&I project needs to have a good and organized plan and a suitable management process, otherwise the successful outcome of the project will be in risk;
3. Generating new products ideas - new product ideas with a relevant impact to society are important to present a strong project idea that is interesting to the stakeholders;
4. Maintaining the quality of R&I processes and methods – in a R&I project we must assure that not only we reach the objectives proposed, but also that they are met with quality. Assuring the quality of R&I processes and methods will allows us to work efficiently and produce good outcomes;
5. Motivating technical people;
6. Establishing cross-disciplinary teams – even though this paper was written more than 20 years ago it already stressed about issues that are even more notorious nowadays. To have a project approved the European Commission (EC) demands a project plan that addresses strategic challenges of our society. And to address these strategic challenges cross-disciplinary teams are fundamental to their development;
7. Coordinating R&I and marketing - apart from a good R&D project plan and the production of the research results with quality, a successful project must also have a plan on how we intend to use the knowledge developed and how the society will benefit from it;
8. Transferring technology to manufacturing - when developing an innovation project with a high Technology Readiness Level (TRL), even in academia, is important to know how we are going to transfer the technology to society. As Dr. Eugene Sweeney referred during an Intellectual Property Webinar “Maximise the impact of your project”, promoted by the European IP Helpdesk on May 27th 2020, nowadays we need to present an Innovation Plan where we describe how we will manage the assets and elaborate a dissemination/exploitation plan. The impact of research isn't a moment's trend but an important consideration to take in account in EC research projects. A project-specific dissemination and exploitation plan is often required and evaluated at proposal stage;
9. Fostering collaboration between R&I and finance - the author only identifies that the R&I staff should have a good communication with the finances department, but in fact it should establish a communication with a diverse number of departments inside the organisation,

namely Human Resources department, Procurement department and Information Technology (IT) department;

10. Linking R&I to business planning.

Mikulskienė (2014) states that “planning techniques help manage time and resources and assist the team with: seeing the big picture; better understanding difficult tasks ahead and when they will happen; putting first things first by prioritising important tasks (...); minimising efforts on unfruitful side tracks; staying focused on the objectives; making better estimates of time and resource needs; improving communication among key personnel; seeing the need to look at alternative approaches or techniques; making better decisions when dealing with trade-offs between time, performance and resource constraints.”

Project Management: 10 Knowledge areas

According to the Project Management Institute (PMI) organised the project management field is organized in ten knowledge areas, that take part on a research project life cycle:

1. *Project Integration Management* - essentially is the integration and coordination of all elements of the project, namely the project activities, resources, stakeholders, and any other project elements. It is in this knowledge area that falls the responsibility to manage the conflicts that may arise in the project development, the need to make trade-offs that allows to make a diverse number of processes, developed by different teams and/or departments, align and work together in a coordinated way. It's considered crucial on the success of a R&I project;
2. *Project Scope Management* - involves the characterisation of the product or result, namely its functions and features. The scope management includes also the activities to be developed in order to achieve what is defined in the functions and features of the results of the project;
3. *Project Time Management* - involves six processes: 1) definition of the activities; 2) organisation the execution sequence of the activities; 3) estimation of the activities resources; 4) estimation of the activities duration; 5) definition of a schedule for the activities execution; 6) controlling and revising the schedule of the activities execution;
4. *Project Cost Management* - involves establishing the project budget, ensuring that the funds available cover the extent of the project, and the definition of a monitoring system and tools through which the costs can be measured and managed;
5. *Project Quality Management* - involves the definition of a plan where it's detailed how the quality assurance and control will be executed and allows to perceive the quality standards are achieved. It also should detail what techniques or tools can be applied for quality improvement;
6. *Project Human Resource Management* - involves the establishment of a plan where is identified the roles and positions needed for the project development and the formation

needs. It also requires a track system that allows to evaluate the team performance and ensuring that the activities are being executed as planned;

7. *Project Communications Management* - involves a communication plan where it's defined how and when the communications to the team, partners and stakeholders will take place. It should also be accounted on the plan the control of the communications to ensure that their efficiency is frequently evaluated and adjusted when needed;

8. *Project Risk Management* - involves a plan where is defined how the risks will be itemized, categorized and prioritized. It should be also established the risks responses, who will be responsible for the risk identification and handling and how the regularity with which the risk register should be reviewed;

9. *Project Procurement Management* - involves a plan where is identified the acquisitions of services and/or products needed for the project development and how the suppliers/contractors will be engaged in the project;

10. *Project Stakeholder Management* - involves listing the stakeholders and prioritizing their concerns and how they could impact the project. The control of the stakeholder's engagement should be made throughout the project, namely by identifying if their needs are being addressed and what adjustments may be needed to achieve their expectations.

These project management areas are vertical oriented, meaning that these ten areas coincide with the different project management process groups, whereas the project management process groups are horizontally oriented and will occur sequentially on the project life cycle.

Project Management and project life cycle

Project management accompanies a project through its life cycle and in some cases, it might be extended after the closing of the project. On Figure 1 is demonstrated a project life cycle and it's diverse sequential stages (project management process groups): 1) project initiation; 2) project planning; 3) project execution, 4) project monitoring and controlling; 5) project closing (Kourounakis, N., & Maraslis, A., 2016).



Figure 1 – R&D Project life cycle

The first phase of a R&I project is the project initiation phase and it's at this stage that the project purpose and objectives are defined, and some initial part of the project planning takes place. The purpose of the project must be aligned with the organisation's strategic objectives. In this phase occurs the following activities (Kourounakis, N., & Maraslis, A., 2016):

- 1) Project planification, where is identified the research idea, the expected R&I project outcomes and the challenges that the project will address;
- 2) Preparation of the grant proposal, where is provided the: a) project scope; b) detailed objectives and methodologies to be implemented in the project development; c) activities timeline, typically in the form of a Gantt chart; d) milestones and deliverables; e) resources already available at the organisation; f) budget and resources plan; g) possible risks, identifying the possible problems that may arise and alternative solutions.

After these activities, the grant proposal of the R&I project is submitted to the identified funding call and upon evaluation and consequent approval by the funding agency the project enters its second phase, where some contractualisation procedures are made with the funding agency and the partners (e.g.: grant agreement and consortium agreement signature, project work plan, project management plan).

The second phase is the project planning phase, at this stage the objective of the R&I project is verified and the initial plan revised, making adjustments if needed (e.g.: dates of the activities development and the resources should be adjusted to the timeframe and budget defined on the grant agreement). It is in this phase that the project work and project management plans are structured, and the kick-off meeting with all partners of the project is prepared (Kourounakis, N., & Maraslis, A., 2016).

The project implementation phase sets the beginning of the project activities and the kick-off meeting is promoted by the coordinator. In this stage all the plans prepared previously start to be implemented until the closing phase (Kourounakis, N., & Maraslis, A., 2016).

Simultaneously with the project execution phase we have the project monitoring and controlling phase. During this phase the R&D project execution activities are regularly reviewed and monitored to make sure that everything is being developed according to the project work plan and to promptly address any deviations and risks. Also, it's in this phase that happens all the communications with the funding agency, namely adjustments requests - when the deviations on the project might not be handled without altering the initial plan; interim scientific and financial reports (Kourounakis, N., & Maraslis, A., 2016).

The project closing phase signals the official end of the project and it's when all the project documents, reports and deliverables are prepared to be sent to the funding agency. At this stage is important to not only acknowledge the team involved in the R&D project, but also to discuss the overall experience and document the know-how learned and the best practices implemented that might be useful in future projects (Kourounakis, N., & Maraslis, A., 2016).

RMA in Research Management

When managing R&I projects the RMA must focus on the efficiency and quality of the R&I activities and must make sure that the planned activities and budget are being executed according to the project work plan. The RMA deals with a multitude of situations and issues, namely: 1) identifying the funding schemes; 2) aiding on the proposal writing procedure; 3) schedule the R&I activities and plan the resources needed to develop the project; 4) manage the

scientific and financial development of the project – the RMA should keep track of the tasks being developed, the costs associated with each task and proceed with adjustments and corrections when needed, present reports to the funding agency; 5) promote the dissemination and communication of the projects development; 6) manage the finalisation of the project – the RMA aids the principal investigator gathering all the project information, so it can be made an evaluation of the project indicators, access if they were met and to prepare the final report; 7) management of the knowledge produced by the project, focusing on its use and impact to society (Mikulskienė, B., 2014; Kourounakis, N., & Maraslis, A., 2016).

Due to the large spectre of RMAs actions, in a Research Performance Organisation (RPO) we can observe different types of managers with different and specialized competencies (e.g.: pre-award manager and post-award manager, team manager, laboratory manager, communication manager, intellectual property manager).

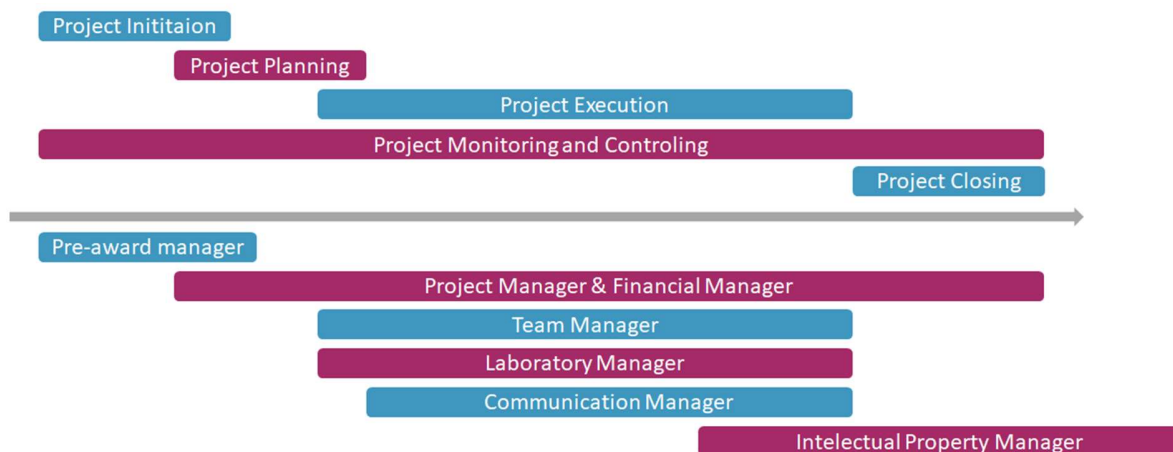


Figure 2 – RMAs in a project life cycle

Each type of managers mentioned above, since they have specific competencies, can participate in a R&I project in different phases of the project life cycle, as shown on figure 2.

The pre-award manager is responsible for identifying the best funding scheme for a specific idea or research plan that a researcher wants to develop and aids on the proposal writing procedure. The pre-award manager advises the researcher on the specificities of the call and must guide on how to address successfully all topics of the application form.

The post-award manager is responsible for the financial compliance monitoring, verifying if the financial execution of the project occurs according to the funding agency financial rules and applicable national laws. The post-award manager also has a significant participation in aiding the principal investigator with the articulation with the funding agency and helping in some project modification processes, like budget revision due to project deviations. Throughout the project execution the post-award manager is responsible for the preparation and organisation of report documents and financial reports submission, and for the project closing procedure and audit preparation. The post-award manager can also have a narrow collaboration with the pre-award manager, specifically on the establishment of the budget and resources plan on the application preparation.

The team manager, laboratory manager and even communication manager roles can be executed by the project manager, this role separation depends on the internal organisation of the institution or of the project needs. The team manager is responsible for managing the team of the project, accessing the team's performance and deals with internal conflicts that may arise. The laboratory manager is responsible for the maintenance of the laboratory, certifying that the project team has all resources needed at the laboratory, and for the requesting of material necessary for the project activities.

The intellectual property manager is responsible for aiding in the writing of the IP protection requests to be submitted to IP offices, preparation and revision of non-disclosure agreements and for the revision of the IP clause present on the consortium agreements. The role of the IP manager can be extended after the closing of the project, since he accompanies the IP concession procedure - that may take up to 2 years - and he is involved in the licensing agreements and technology transference activities.

Advantages and disadvantages of pre-award and post-award integration

While pre and post-award research administration procedures differ, both functions are a vital part of research administration, and there are both advantages and disadvantages in the integration of these research management areas (The Advisory Board Company, 2011).

Pre and post-award as separate RMAs

The pre and post-award RMAs act separately in separate units and offices.

advantages: being exclusively dedicated to the pre-award research management the RMA can develop a high level of specialization and become knowledgeable in very specific niche area;

disadvantages: a strict separation between pre and post-award management can lead to a inefficient communication and contribute to some difficulty, for both pre and post-award RMAs, gaining perspective on the whole process of research administration;

Hybrid pre and post-award RMAs

The pre and post-award RMAs act separately in the same unit or office.

advantages: the RMAs specialize in specific niche areas and develop a closer communicating between pre and post-award management procedures, that ultimately will benefit and increase the convenience of the principal investigator;

disadvantages: it may lead to the need of additional staff leaders (e.g.: pre-award coordinator and post-award coordinator) and the RMAs must lead with the existence of different roles and responsibilities in the same office;

Integrated pre and post-award RMAs

The RMAs work in the same office and there is no separation between pre and post-award managers, since all RMAs act on the same procedures.

advantages: being the RMAs generalists (working as pre and post-award managers) it can contribute to a flexibility in adjusting to high work loads periods both on the pre or post-award procedures; also the project monitoring is more streamlined since the same RMA has managed the project from the beginning and aiding as well in the communication development with the principal investigator;

disadvantages: the training of a RMA that works as a pre and post-award manager is extensive and leads to a large volume of information to master.

Project Management Offices (PMO)

Often project managers are integrated into a wider research support team, such as in a Research Support Office or in the Research and Innovation department. Nevertheless, the composition and diversity of such teams/ offices vary from the type of RPO institution (University, private research institution, technological/ interface institution, etc.) but also from its level of professional maturity and development (connected with great discrepancies of R&I performance between countries even within Europe). There are different frameworks that define the roles and governance of a Project Management Office which can provide us an overview of possible organizational distributions. The most recognized ones are:

1. Project Management Body of Knowledge (PMBOK): Developed by the Project Management Institute (PMI) in the United States, it divides the management of projects into five process groups and ten knowledge areas. The process groups run roughly in chronological order (project phases) and the knowledge areas are utilized whenever the expertise on that topic is required. The process groups are horizontal, and the knowledge areas are vertical.
2. PRINCE2: Developed by the UK government PRINCE2 is a system of project organization that defines a specific project organizational structure, roles and responsibilities which must be filled for the project to be considered a PRINCE2 project.
3. Individual Competence Baseline (ICB4): Developed by the International Project Management Association (IPMA), this is a standard methodology of project manager competence. This guide is divided into 24 competence elements each of which contain key competence indicators which can be used to judge a project manager.

Looking at such frameworks can help us understand the dynamics of the Project Management Offices, its roles and governance. Since each framework focuses on different aspects, we can take them into account in different analyses.

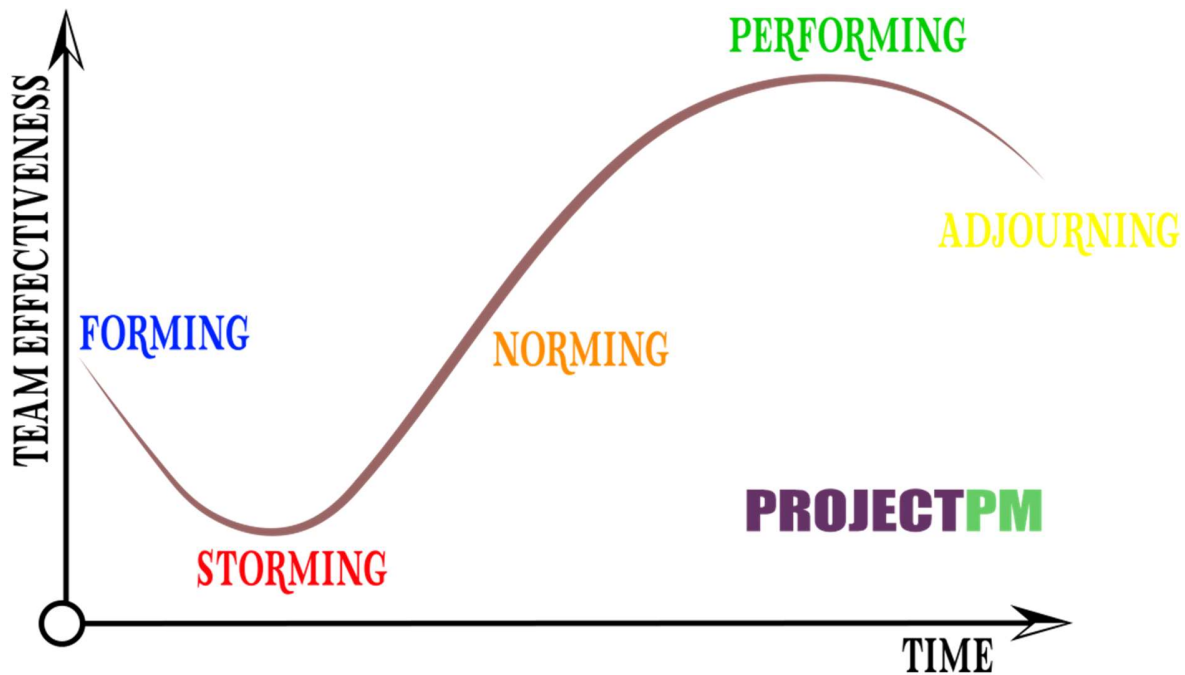
Depending on the organization and also on the level of professional maturity / development, there are different possible configurations of teamwork for project managers, from a wide and very specialized RMA team (that supports the project management as a team effort addressing its different aspects - financial, communication, open science, etc.) to a small and generalized team (where the project manager has an overview about all issues relevant). In this regard, several authors have been analysing this issue, as we can see in the article [Project Management](#)

[Office Models – a review](#) by Monteiro. A, et al. For example, the PMBOK categorizes the PMO based on their 1) influence and 2) position within the organization as such:

- 1) based on the level of influence we can have:
 - a) **Supportive PMO**: provide a consultative role to projects by supplying templates, best practices, training, access to information and lessons learned from other projects. This type of PMO serves as a project repository. Low degree of control.
 - b) **Controlling PMO**: provide support and require compliance through various means. Compliance may involve adopting project management frameworks or methodologies, using specific templates, forms, and tools, or conformance to governance. Moderate degree of control.
 - c) **Directive PMO**: take control of projects by directly managing them. High degree of control
- 2) based on the position they have within the organization we can have:
 - a) **Individual PMO** or “Project Management Office”: typically provide functional support (e.g., infrastructure, document management, training, etc.) to a single complex project or program. They set basic standards and oversee planning and control activities for a single project.
 - b) **Departmental PMO** or “Business Unit PMO”: Departmental PMOs provide support for multiple projects at a department or business unit level. Their primary challenge is to integrate projects of different sizes within a division (e.g., IT, Finance) from small, short term initiatives to multi-year programs with multiple resources and complex integration of technologies.
 - c) **Corporate PMO** or “Enterprise PMO”: Corporate PMOs create standards, processes, and methodologies to improve project performance within an organization. They are typically responsible for allocating resources to different projects across the organization.

Team development and individual roles

A project management team consists of people working together in a committed way towards a common goal: manage the research project. But, as their organizations and offices, teams also mature, grow and develop. In this regard it is important to acknowledge the [four-stage model of Bruce Tuckman](#) where he proposes that such team development occurs in a fairly clearly defined growth cycle: **Forming, Storming, Norming, and Performing** (later he added a fifth stage, "adjourning").



Source: <https://project.pm/team-development-tuckman/>

Different stages have different levels of effectiveness and, as project manager, managing all stages accordingly is key (specially the “storming”!). Let us look the definition of each stage:

1. **Forming:** this is when team members meet for the first time and, as such, most team members are positive and polite, others can be anxious or simply excited about the task ahead. The leader of the management team plays a dominant role at this stage, because team members' roles and responsibilities aren't clear. This stage can last for some time, as people start to work together, and as they try to get to know their new colleagues.
2. **Storming:** Next, the team moves into the storming phase, where people start to push against the boundaries established in the forming stage. This is the stage where many teams fail. Storming often starts where there is a conflict between team members' natural working styles. People may work in different ways for all sorts of reasons but, if different working styles cause unforeseen problems, they may become frustrated. Storming can also happen in other situations. For example, team members may challenge your authority, or jockey for position as their roles are clarified. Or, if you haven't defined clearly how the team will work, people may feel overwhelmed by their workload, or they could be uncomfortable with the approach you're using. Some may question the worth of the team's goal, and they may resist taking on tasks. Team members who stick with the task at hand may experience stress, particularly as they don't have the support of established processes or strong relationships with their colleagues.
3. **Norming:** Gradually, the team moves into the norming stage. This is when people start to resolve their differences, appreciate colleagues' strengths, and respect your authority as a leader. Now that your team members know one another better, they may socialize together, and they are able to ask one another for help and provide constructive

feedback. People develop a stronger commitment to the team goal, and you start to see good progress towards it. There is often a prolonged overlap between storming and norming, because, as new tasks come up, the team may lapse back into behaviour from the storming stage.

4. **Performing:** The team reaches the performing stage, when hard work leads, without friction, to the achievement of the team's goal. The structures and processes that you have set up support this well. As leader, you can delegate much of your work, and you can concentrate on developing team members. It feels easy to be part of the team at this stage, and people who join or leave won't disrupt performance.
5. **Adjourning:** Many teams will reach this stage eventually. For example, project teams exist for only a fixed period, and even permanent teams may be disbanded through organizational restructuring. Team members who like routine, or who have developed close working relationships with colleagues, may find this stage difficult, particularly if their future now looks uncertain

Diagnosing the stage of development of a management team can help selecting the appropriate intervention and the relevant management and leadership approaches to move the team forward. Looking at the preferred "team roles" of individual team members can also be important.

Team roles

There are different approaches to study **team roles**. One of the most recognized was developed in the 1970s by Meredith Belbin and colleagues at the Henley Management College. In here, based on long-term psychometric tests and studies of business teams, Belbin's team propose the following definition of team roles as "a tendency to behave, contribute and interrelate with others in a particular way". Belbin proposes nine team roles divided into three categories (based on <https://www.belbin.com/about/belbin-team-roles/>):

1. "Resource Investigator": Uses their inquisitive nature to find ideas to bring back to the team.
 - a. Strengths: Outgoing, enthusiastic. Explores opportunities and develops contacts.
 - b. Allowable weaknesses: Might be over-optimistic and can lose interest once the initial enthusiasm has passed.
2. "Team Worker": Helps the team to gel, using their versatility to identify the work required and complete it on behalf of the team.
 - a. Strengths: Co-operative, perceptive and diplomatic. Listens and averts friction.
 - b. Allowable weaknesses: Can be indecisive in crunch situations and tends to avoid confrontation.
3. "Coordinator": Needed to focus on the team's objectives, draw out team members and delegate work appropriately.
 - a. Strengths: Mature, confident, identifies talent. Clarifies goals.

- b. Allowable weaknesses: Be manipulative and might offload their own share of the work.
4. "Plant": Tends to be highly creative and good at solving problems in unconventional ways.
 - a. Strengths: Creative, imaginative, free-thinking, generates ideas and solves difficult problems.
 - b. Allowable weaknesses: Might ignore incidentals and may be too preoccupied to communicate effectively.
5. "Monitor Evaluator": Provides a logical eye, making impartial judgements where required and weighs up the team's options in a dispassionate way.
 - a. Strengths: Sober, strategic and discerning. Sees all options and judges accurately.
 - b. Allowable weaknesses: Sometimes lacks the drive and ability to inspire others and can be overly critical.
6. "Specialist": Brings in-depth knowledge of a key area to the team.
 - a. Strengths: Single-minded, self-starting and dedicated. They provide specialist knowledge and skills.
 - b. Allowable weaknesses: Tends to contribute on a narrow front and can dwell on the technicalities.
7. "Shaper": Provides the necessary drive to ensure that the team keeps moving and does not lose focus or momentum.
 - a. Strengths: Challenging, dynamic, thrives on pressure. Has the drive and courage to overcome obstacles.
 - b. Allowable weaknesses: Can be prone to provocation and may sometimes offend people's feelings.
8. "Implementer": Needed to plan a workable strategy and carry it out as efficiently as possible.
 - a. Strengths: Practical, reliable, efficient. Turns ideas into actions and organises work that needs to be done.
 - b. Allowable weaknesses: Can be a bit inflexible and slow to respond to new possibilities.
9. "Completer Finisher": Most effectively used at the end of tasks to polish and scrutinise the work for errors, subjecting it to the highest standards of quality control.
 - a. Strengths: Painstaking, conscientious, anxious. Searches out errors. Polishes and perfects.
 - b. Allowable weaknesses: Can be inclined to worry unduly, and reluctant to delegate.

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