

Designing a Project Categorisation System

The Project Categorisation System

The project (or program) categorisation system adopted by an organization should provide a useful insight into the differences between projects in one category and projects in every other category, and be easily understood across the organization. A pragmatic classification framework should consider the **type** of project based on the project's the organization typically undertakes and then the degree of **difficulty** of each project within its type:

- The **type** provides an understanding of the technology, methods, equipment, and tools needed to deliver the project.
- The degree of **difficulty** indicates the challenges, and therefore the capabilities needed by the project team to successfully manage the project.

Combining **type** and **difficulty** allows a simple classification matrix to be developed and projects assigned to an appropriate classification.

		Project Type					
		Project Type 1	Project Type 2	Project Type 3	Project Type 4	Project Type 5	Project Type 6
Degree of Difficulty	Simple	Project 6					Project 7 Project 4
	Low		Project 1				
	Normal				Project 3		
	High		Project 2				
	Very High						
	Extreme	Project 8				Project 5	

This White Paper describes an approach to developing a consistent classification process based on **type** and **difficulty**. Once implemented this classifications will facilitate the tailoring of HR and staffing decisions, stakeholder management, risk assessment and management, and the type of project controls effort needed to achieve consistent outcomes.

A second White Paper *Project Size and Categorisation*¹ discusses the overall challenge of project categorization and the different approaches suggested by authors in the past.

Above all, the categorization system needs to be robust, simple to apply, and useful to the organization.

¹ Download *Project Size and Categorisation*:
https://mosaicprojects.com.au/WhitePapers/WP1072_Project_Size.pdf



Categorisation by Type of Project

Many different aspects of a project can be considered when deciding what **types** matter to the organisation. Building a sensible set of categories based on **type**, covering any project the organization would normally expect to encounter can be helped by considering a range of up to five or six attributes drawn from:

- The purpose or focus of the project such as: Organizational change, Engineering/construction, Information technology, Research and development, etc.
- Using a system based on the standard industry classifications published by governments
- Is the project client internal to the organization or from an external entity
- The purpose of the project from the performing organization's perspective²
- Is the project a *hard* project or a *soft* project³
- The stage in the product's lifecycle, R&D, Development, Implementation, Operations, Maintenance
- Alignment with different aspects of the organization's structure or strategy
- The project's importance and/or urgency
- Geographic location
- The form of contract or relationship with clients, suppliers, and contractors: Alliance, Partnership, Joint Ventures, traditional, etc.
- Sources of funding and/or types of ownership
- Distinguishing between normal, complex, and mega projects⁴.

For a more detailed discussion on categorisation and its uses in knowledge management, training, and other aspects of managing an organization that 'does projects', see:

- The discussion in *Project Size and Categorisation*⁵, or
- *Investigation of potential classification systems for projects*⁶.

Categorisation by Degree of Difficulty

The next stage is to assign a level of difficulty to each project within the **type**. The approach recommended is to first establish what a normal project of the **type** looks like and then based on this normal level of difficulty assess the relative difficulty of the project being categorised.

² Examples of 'purpose' can include:

- Product development, market development, system maintenance, etc.
- Client project (to acquire something) -v- contractor project (to deliver something)

³ **Hard** projects produce a tangible output, whereas the output from a **soft** project is largely intangible. See: <https://mosaicprojects.wordpress.com/2023/01/21/hard-v-soft-projects/>

⁴ For more on *differentiating normal, complex and megaprojects* see: <https://mosaicprojects.wordpress.com/2017/06/09/differentiating-normal-complex-and-megaprojects/>

⁵ Download *Project Size and Categorisation*: https://mosaicprojects.com.au/WhitePapers/WP1072_Project_Size.pdf

⁶ Crawford, L., Hobbs, J. B., & Turner, J. R. (2002). *Investigation of potential classification systems for projects*. Paper presented at PMI® Research Conference 2002: Frontiers of Project Management Research and Applications, Seattle, Washington. Newtown Square, PA: Project Management Institute. <https://www.pmi.org/learning/library/investigation-potential-classification-systems-projects-8967>



Six levels of difficulty are adequate:

1. **Simple:** Very easy to accomplish compared to ‘normal’ – ideal training ground for inexperienced people.
2. **Low:** Noticeably less difficult than normal projects of this type.
3. **Normal:** The business-as-usual project of this type. If the type is *satellite launches*, the project will involve rocket-science, what is needed is a typical satellite launch project to compare the others in the type against.
4. **High:** Noticeably more difficult than normal projects of this type.
5. **Very High:** Significantly more difficult than normal projects of this type. The project team will need highly capable leaders and focused support from the organization.
6. **Extreme:** Do you really want to undertake a project with this level of difficulty. Very significant risks⁷ are involved with a high probability of failure.

This assessment can be subjective or based on the set of calculations discussed below.

Calculating the Degree of Difficulty

mosaic						Calculating Project Difficulty	
Project Name:	Project Name					Set	
Project Type:	Project Type					Weighting	
Size	Much smaller	Smaller	Similar	Larger	Much larger		1
Technical Difficulty (complication)	Much less	Less	Similar	Greater	Much Greater		1
What is to be delivered	Fully defined	Partially defined	Objectives defined	Objectives outlined	Unclear		2
How the product is to be created	Fully understood	Partially understood	General approach	Conceptual framework	Unclear		3
Key Stakeholder Support	Generally committed	Generally supportive	Ambivalent	Some opposition	Generally antagonistic		1
Team structure	Very simple	Simpler than normal	Normal for type	More complicated	Complicated arrangements		4
Project Risk Profile	Low	Normal	High	Very High	Extreme		4
Complexity of Work	Simple	Normal	Normal + Political	Complex	Highly Complex		5
Complexity of Developing Product	Done many times before	Done once or twice before	Components done before in different context	New technical systems required	New theory to develop and implement		5
Calculated Relative Difficulty:						To be assessed	

⁷ For more on *risk management* see: <https://mosaicprojects.com.au/PMKI-PBK-045.php>



While a subjective assessment may be adequate for many organisations, a degree of objectivity can help. To facilitate the process of consistently assessing the degree of difficulty for each project, Mosaic has developed a free calculator available from: https://mosaicprojects.com.au/ftp/Difficulty_Calculator.xlsx

The calculator considers eight aspects of difficulty on a scale of 1 to 5, weighed for relative importance.

Each aspect is considered in relation to a normal project of the type using the guidelines below. Once an assessment is complete, the spreadsheet can be printed or saved for future reference.

Note: The range parameters outlined below are suggestions only. Organizations will need to assess what ranges work best for their projects. All that is required to use the spreadsheet is a consistent view across the projects in a **type** classification. Different measures and ranges can be used for different **types**.

The difficulty aspects considered in the spreadsheet are:

Size:

The size of a project is usually measured in terms of budget, but may be based on the number of people engaged in the work, the estimated number of hours, or some other metric such as function points or story points. The relative size of the project being assessed compared to the 'normal' project is expected to be:

Much smaller: Less than half the size of a 'normal' project.

Smaller: Between half (50%) and 80% of the size of a 'normal' project.

Similar: Within plus/minus 20% of the 'normal' project.

Larger: Between 120% and double (200%) of the size of a 'normal' project.

Much larger: More than twice the size of a 'normal' project.

Technical Difficulty (complication):

Assessing technical difficulty will be more subjective and needs to consider the knowledge and experience of the organization. The technical difficulty associated with each project within a **type** is a combination of the characteristics of the output being produced, the work needed to accomplish the project's objectives, and the time available to complete the work. The relative technical difficulty of the project being assessed compared to the 'normal' project is expected to be:

Much less: The work is expected to be very easy to accomplish compared to a 'normal' project.

Less: The work is expected to be noticeably easier to accomplish compared to a 'normal' project.

Similar: The difficulty of accomplishing the work is expected to be about the same as a 'normal' project.

Greater: The work is expected to be noticeably harder to accomplish compared to a 'normal' project.

Much greater: The work is expected to be very difficult to accomplish compared to a 'normal' project.



What is to be delivered⁸:

The degree of uncertainty associated with the project's deliverable (what has to be achieved) changes the way the project is managed. There is always a degree of uncertainty associated with every project, what matters is understanding the degree of uncertainty and ensuring most key stakeholders appreciate this. The uncertainty associated with the product and objectives to be delivered are on the scale:

Fully defined: The both the product (deliverable) and the project's objectives are defined and documented.

Partially defined: The product and the project's objectives are understood but there is still significant detail to be developed for a complete design.

Objectives defined: What the project is intended to achieve (its functionality) is fully agreed, but the way the functionality will be developed has to be determined.

Objectives outlined: There is general agreement on the overall objectives to be achieved, but the precise details of the objectives and how they will be delivered are still to be developed.

Unclear: The problem the project is expected to solve can be seen, but what is needed to achieve a solution still has to be developed.

How the product is to be created⁹:

The degree of uncertainty associated with how the work needed to create the project's deliverable will be undertaken affects the methodology used and the difficulty involved in managing the work through to completion, on the scale:

Fully understood: Similar projects have been done before (by the people involved in this one) and the challenges involved in the work are known.

Partially understood: Most elements of the work have been done before but are being used in new ways or in different circumstances.

General approach: There is a general understanding of how this type of project is delivered (maybe by observing other organizations), but there is very limited experience in actually doing this type of work.

Conceptual framework: The project involves the creation of new technical systems and working in new ways, but there is a reasonable understanding of the approach to be taken.

Unclear: The project requires a new way of working to be developed and implemented, it is at *the bleeding edge* of technology.

Key Stakeholder Support:

Key stakeholders are the subset of stakeholders who have power to prevent the project from achieving its full set of objectives and potentially may cause the project to fail¹⁰. These are typically senior management within the performing organization, but may include managers in the client organization and various

⁸ This is one aspect of **uncertainty** discussed in **Project Size and Categorisation:** https://mosaicprojects.com.au/WhitePapers/WP1072_Project_Size.pdf

⁹ This is the other aspect of **uncertainty** discussed in **Project Size and Categorisation:** https://mosaicprojects.com.au/WhitePapers/WP1072_Project_Size.pdf

¹⁰ For more on **key stakeholders** see: https://mosaicprojects.com.au/Mag_Articles/N008_Key_Stakeholders.pdf



external authorities. While every stakeholder is an individual and all of the key stakeholders need managing¹¹, this assessment looks at the general ambience of the group:

Generally committed: Most of the group, and particularly the sponsor or oversight committee are committed to the success of the project and will provide the resources and support needed.

Generally supportive: Most of the group, see the project as a worthwhile undertaking but are not necessarily prepared to provide the resources and support needed to ensure success.

Ambivalent: There are mixed feelings within the group and/or most people do not really care about the project.

Some opposition: Some of the group are actively opposed to the project and may work against its best interests. The supporters in management need to work to overcome this opposition.

Generally antagonistic: Many key stakeholders do not like the project and would be happy to see it fail creating significant difficulties in achieving a satisfactory outcome.

Team structure:

The team includes all of the people and organizations involved in the work of delivering the project. For a small in-house IT project this may include the developers, some business support and possibly one or two external contractors. For a major infrastructure project, the Alliance partners funding the work, prime contractors, subcontractors, and extensive supply chains. The assessment is based on the 'normal' project of the **type** being assessed, not some overall view of project teams. The range is:

Very simple: Compared to the normal arrangements, the team structure for this project is expected to be very straightforward and there are usually significantly less people involved in the work. This means internal communication and team relationships will be relatively simple.

Simpler than normal: There are a number of aspects of the team that are notably less complex than the normal teams used on this type of project.

Normal for type: The team expected to be used to undertake the work will be similar to a 'normal' project. Normal contract management and/or team managed processes are all that will be needed.

More complicated: There are a number of aspects of the team arrangements that are expected to be notably more complex than the normal teams used on this type of project.

Complicated arrangements: The team and contract arrangements needed to deliver this project will be significantly more complicated and difficult compared to 'normal'. Significantly more management effort will be needed to manage the overall team.

Project risk profile:

The project risk profile is a combination of the degree of uncertainty associated with undertaking the project and the severity of the consequences should some of the risks occur¹². The focus of this assessment is the likely status of the project risk register at the time the project's work commences (ie, the accepted and innate risks the project will be exposed to after appropriate risk mitigation and other risk management

¹¹ For more on **effective stakeholder engagement** see: <https://mosaicprojects.com.au/PMKI-SHM-005.php#Overview>

¹² For more on **risk assessment** see: <https://mosaicprojects.com.au/PMKI-PBK-046.php>



actions have been implemented). As with the other assessments this is compared to a normal project of the type; manned space flight is innately high risk, but is this project more, or less, risky than other manned space missions? The range is:

Low: The number of significant risks in the project risk profile is expected to be significantly less than normal for this type of project.

Normal for the type: The project risk profile is expected to be similar to most projects of this type.

High: The number of significant risks in the project risk profile is expected to be significantly more than normal for this type of project.

Very high: There are a number of major risks in the project risk profile that have the potential to place the successful completion of the project in jeopardy.

Extreme: There are a number of risks that have the potential to damage the organisation, and that cannot be avoided, associated with the work of the project.

Complexity of Work:

This aspect of complexity is focused on the work processes needed to create the product rather than the product itself. Building in a desert, or the Arctic is far more complex than in a temperate climate. Client imposed sequencing and handover sequences can create complications, as do external stakeholder influences such as declared environmentally sensitive areas around the project. The range is:

Simple: Compared to the normal arrangements organising and managing the work is expected to be relatively simple.

Normal: The arrangements needed to organise and manage the work are normal for this type of project.

Normal + Political: While the arrangements needed to organise and manage the work are normal for this type of project, there are external political influences that will cause complications.

Complex: The arrangements needed to organise and manage the work are notably more complex than the normal arrangements used on this type of project.

Highly complex: The arrangements needed to organise and manage the work are significantly more complex than the normal arrangements used on this type of project, successful delivery will require an exceptional effort and there are identified risk factors.

Complexity of Developing the Product:

This aspect of complexity is focused on how familiar the organisation is with the systems and technology embedded in the product being developed. Regardless of the degree of complexity involved in the product, if the organisation has done many similar projects, it should have the capability to do the next. Whereas the first time will be far more difficult. The range is:

Done many times before: The organization understands how to deliver this type of project.

Done once or twice before: The organization is learning how to deliver this type of project.

Components done before in a different context: The organization knows how to deliver various aspects of the project, but the overall deliverable is new.



New technical systems required: The organization has to develop some new processes and components to enable the project to be delivered, there are clear risks involved.

New theory to develop and implement: The organization has no prior experience in delivering this type of project and has to invent much of the processes and technology needed.

Weighting:

The weighting factor applied to each of the criteria above is in the range 1 to 5:

- 1** Means the criteria only has a low level of influence on the overall assessment of difficulty.
- 3** Means the criteria only has an average level of influence on the overall assessment of difficulty.
- 5** Means the criteria has a high level of influence on the overall assessment of difficulty.

The weightings can be changed as needed. While changing the relative importance of each criteria, the spreadsheet is designed so that setting all of the weightings to 1, or all to 5 (or any other combination of values) will not change the relative assessment of the difficulty of a project, the assessment range remains between Low and Extreme.

Using the Spreadsheet

Using the spreadsheet to assess the difficulty of a project is very straightforward:

- The first essential is to determine the **type** of the project being assessed. The difficulty ratings are relative to a 'normal' (or average) project of this **type**, not an arbitrary overall ranking. It is easiest to take a known project as being fairly 'normal for this **type** of project' rather than imagining an abstract concept.
- Then understand what is 'normal' for each of the categories used in the spreadsheet. These will be the comparison points.
- Next set the weightings to the pattern used for assessing this **type** of project. Some aspects of a project are more significant than others, but this changes depending on what the various drivers for success and failure are. Sometimes the team is more important, other times the technology or the stakeholders. The weighting allows the more important factors to have more influence.
- Add the project name and its **type** to the top of the spreadsheet for reference.
- Finally for each category, place an X under the option that best describes the project being assessed compared to the 'normal' project.

While a single person can do all of the above, we have found when using a similar technique to assess the relative importance of stakeholders, the consensus view of a small group (3 to 5) with different perspectives or organizational roles, tends to get more consistent and repeatable results.

As data is entered and edited, the spreadsheet automatically calculates the difficulty rating for the project using the six levels of difficulty described above: Simple, Low, Normal, High, Very High, Extreme. The calculation is complete once the last data point is entered.

The spreadsheet can be printed or stored for future reference and the project included in the matrix shown on page 1.



mosaic Calculating Project Difficulty						
Project Name:	Project Name					Set
Project Type:	Project Type					Weighting
Size	Much smaller	Smaller	Similar	Larger	Much larger	
				X		1
Technical Difficulty (complication)	Much less	Less	Similar	Greater	Much Greater	
				X		1
What is to be delivered	Fully defined	Partially defined	Objectives defined	Objectives outlined	Unclear	
		X				2
How the product is to be created	Fully understood	Partially understood	General approach	Conceptual framework	Unclear	
	X					3
Key Stakeholder Support	Generally committed	Generally supportive	Ambivalent	Some opposition	Generally antagonistic	
				X		1
Team structure	Very simple	Simpler than normal	Normal for type	More complicated	Complicated arrangements	
				X		4
Project Risk Profile	Low	Normal	High	Very High	Extreme	
			X			4
Complexity of Work	Simple	Normal	Normal + Political	Complex	Highly Complex	
				X		5
Complexity of Developing Product	Done many times before	Done once or twice before	Components done before in different context	New technical systems required	New theory to develop and implement	
		X				5
Calculated Relative Difficulty:			High			16

The spreadsheet can be downloaded free of charge from:
https://mosaicprojects.com.au/ftp/Difficulty_Calculator.xlsx

Conclusion

The value of having a practical project classification system has been recognised for decades. Our first White paper was published in 2016 based on ideas from the 1990s¹³. The problem for most of the proposed systems to date has been the global view of the authors and proponents. While developing a global classification system may be a highly desirable approach, the problems are immense and no one has achieved a generally acceptable model.

¹³ See *Project Size and Categorisation*, download from:
https://mosaicprojects.com.au/WhitePapers/WP1072_Project_Size.pdf

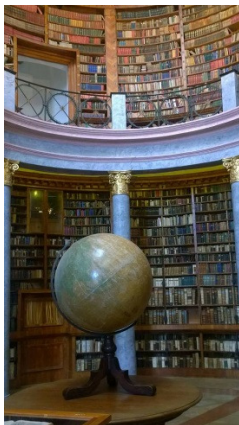


This White Paper builds on our earlier work looking for a global system, with one significant alteration. The change of focus to the people who will use a classification system. This group work within an organization and are therefore primarily interested in that organization's projects. Which means:

1. There will be a relatively limited number of project **types**, and the classification of **type** used can be tailored to the needs of the organization.
2. The degree of **difficulty** experienced in managing a project successfully is a function of the organization's knowledge and experience. Therefore, what matters in a classification system is the relative difficulty of the project being assessed from the organizations perspective.

The model proposed in this White Paper achieves these objectives.

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