

VISUALS FOR INFLUENCE: IN PROJECT MANAGEMENT AND BEYOND

BRONTE VAN DER HOORN

University of Southern Queensland
Toowoomba



Visuals for influence: in project management and beyond by University of Southern Queensland is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License, except where otherwise noted.

Visuals for influence: in project management and beyond by Bronte van de Hoorn is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International Licence, except where otherwise noted.

All images contained within this book retain their copyright or original Creative Commons Licences and can only be re-used under their respective licences.

Disclaimer: Note that corporate logos and branding are specifically excluded from the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International Licence of this work, and may not be reproduced under any circumstances without the express written permission of the copyright holders. The following content is specifically excluded from the Creative Commons Attribution-NonCommercial Sharealike 4.0 International licence of this work, and may not be reproduced under any circumstances without the express written permission of the copyright holders –

- Tufte, ER (2006) Beautiful Evidence, Connecticut, Graphics Press LLC.
- Adobe

DEDICATION

*Dedicated to my dad,
who introduced me to CorelDRAW and a colour printer at age eight,
and instilled in me the value of design.*

CONTENTS

Acknowledgment of Country	x
Preface	1
About the author	2

Part A: Get visual, build influence, drive action

1. A call to visualise	4
2. The science of visuals	10
2.1 <i>The limited working memory</i>	10
2.2 <i>The architecture of working memory</i>	11
2.3 <i>Working memory and cognitive load</i>	13
2.4 <i>Applied efficacy for the use of visuals</i>	14
2.5 <i>A historical and cultural perspective</i>	14
2.6 <i>Maximising working memory for project stakeholders</i>	15
3. Visuals in project work	19
3.1 <i>Sensemaking in project work</i>	19
3.2 <i>Visuals as ‘boundary objects’</i>	20
3.3 <i>Examples of using visuals in project work</i>	22
3.4 <i>The project managers’ and executives’ perspective on visuals</i>	25

Part B: Visual fundamentals

4. Tools for creating visuals	29
4.1 <i>Software for creating visuals</i>	30
4.2 <i>Software to support the design process</i>	33

5. Visual norms and styling	38
5.1 Page layout	38
5.2 Colour	41
5.3 Iconography, shapes and scale	43
5.4 Text and typography	45
5.5 Common charts and graphs	47
5.6 A word of caution...	47
6. The design process	51
6.1 The design process	51
6.2 Visual housekeeping and file conventions	56

Part C: Visual archetypes for project management

Archetype 1: Comparison between options	62
<i>Example A: Comparison between options</i>	62
<i>Example B: Comparison between options</i>	63
<i>Guidelines for tailoring the archetype</i>	65
<i>Example A: Comparison between options (with annotations)</i>	65
<i>Example B: Comparison between options (with annotations)</i>	66
<i>'Comparison between options' templates</i>	66
Archetype 2: Comparison over time	67
<i>Example A: Comparison over time</i>	68
<i>Example B: Comparison over time</i>	70
<i>Guidelines for tailoring the archetype</i>	71
<i>Example A: Comparison over time (with annotations)</i>	72
<i>Example B: Comparison over time (with annotations)</i>	72
<i>'Comparison over time' templates</i>	72

Archetype 3: Variable-based comparison	74
<i>Example A: Variable-based comparison</i>	74
<i>Example B: Variable-based comparison</i>	75
<i>Guidelines for tailoring the archetype</i>	77
<i>Example A: Variable-based comparison (with annotations)</i>	78
<i>Example B: Variable-based comparison (with annotations)</i>	78
<i>'Variable-based comparison' templates</i>	78
Archetype 4: Sequence - timeline of activities	80
<i>Example A: Sequence – timeline of activities</i>	80
<i>Example B: Sequence – timeline with activities</i>	81
<i>Guidelines for tailoring the archetype</i>	83
<i>Example A: Sequence – timeline with activities (with annotations)</i>	84
<i>Example B: Sequence – timeline with activities (with annotations)</i>	84
<i>'Sequence – timeline with activities' templates</i>	84
Archetype 5: Sequence - process timeline	86
<i>Example A: Sequence – process timeline</i>	86
<i>Example B: Sequence – process timeline</i>	87
<i>Guidelines for tailoring the archetype</i>	88
<i>Example A: Sequence – process timeline (with annotations)</i>	88
<i>Example B: Sequence – process timeline (with annotations)</i>	89
<i>'Sequence – process timeline' templates</i>	89
Archetype 6: Reasons and drivers	91
<i>Example A: Reasons and drivers</i>	92
<i>Example B: Reasons and drivers</i>	94
<i>Guidelines for tailoring the archetype</i>	95
<i>Example A: Reasons and drivers (with annotations)</i>	95
<i>Example B: Reasons and drivers (with annotations)</i>	96
<i>'Reasons and drivers' templates</i>	96

Archetype 7: Anticipated outcomes or benefits	97
<i>Example A: Anticipated outcomes or benefits</i>	97
<i>Example B: Anticipated outcomes or benefits</i>	98
<i>Guidelines for tailoring the archetype</i>	99
<i>Example A: Anticipated outcomes or benefits (with annotations)</i>	99
<i>Example B: Anticipated outcomes or benefits (with annotations)</i>	100
<i>'Anticipated outcomes or benefits' templates</i>	100
Archetype 8: Related items	101
<i>Example A: Related items</i>	101
<i>Example B: Related items</i>	102
<i>Guidelines for tailoring the archetype</i>	104
<i>Example A: Related items (with annotations)</i>	104
<i>Example B: Related items (with annotations)</i>	105
<i>'Related items' templates</i>	105
Archetype 9: Hierarchy of items	106
<i>Example A: Hierarchy of items</i>	107
<i>Example B: Hierarchy of items</i>	109
<i>Guidelines for tailoring the archetype</i>	110
<i>Example A: Hierarchy of items (with annotations)</i>	110
<i>Example B: Hierarchy of items (with annotations)</i>	111
<i>'Hierarchy of items' templates</i>	111
Archetype 10: Comparison of relative values	112
<i>Example A: Comparison of relative values</i>	112
<i>Example B: Comparison of relative values</i>	113
<i>Guidelines for tailoring the archetype</i>	115
<i>Example A: Comparison of relative values (with annotations)</i>	115
<i>Example B: Comparison of relative values (with annotations)</i>	116
<i>'Comparison of relative values' templates</i>	116

Archetype 11: Pictorial - contributions of parts to outcomes	118
<i>Example A: Pictorial – contributions of parts to outcomes</i>	118
<i>Example B: Pictorial – contribution of parts to outcomes</i>	118
<i>Guidelines for tailoring the archetype</i>	120
<i>Example A: Pictorial – contributions of parts to outcomes (with annotations)</i>	120
<i>Example B: Pictorial – contribution of parts to outcomes (with annotations)</i>	121
<i>'Pictorial – contribution of parts to outcomes' templates</i>	121
Archetype 12: Progress tracking	122
<i>Example A: Progress tracking</i>	123
<i>Example B: Progress tracking</i>	125
<i>Guidelines for tailoring the archetype</i>	126
<i>Example A: Progress tracking (with annotations)</i>	126
<i>Example B: Progress tracking (with annotations)</i>	127
<i>'Progress tracking' templates</i>	127
References	129
Acknowledgments	134

ACKNOWLEDGMENT OF COUNTRY

The author wishes to acknowledge the Aboriginal and Torres Strait Islander peoples of this nation. We acknowledge the traditional custodians of the country throughout Australia and their continuing connection to the land, culture and community. We acknowledge the traditional custodians of the lands on which we live and work, and where the book was written. We acknowledge the cultural diversity of all Aboriginal and Torres Strait Islander peoples and pay respect to Elders past, present and future. We celebrate the continuous living cultures of First Nations Australians and acknowledge the important contributions Aboriginal and Torres Strait Islander people have and continue to make in Australian society.

PREFACE

Visuals make a difference in project work and in general organisational life. I have benefited from creating visuals in project management and operational management roles – and in teaching. Research reveals that my anecdotal experience of these benefits is not unique. Rather, the majority of people enjoy, or even have a preference for, engaging with visual material and those who use visuals can increase their influence as their messages are often more easily understood and better remembered than text-based communications alone.

However, few people in management and affiliated roles feel they have the skills, creativity or equipment to develop visuals to use in their professional contexts. It can be daunting to face the blank page with a muddle of thoughts and a deadline to enable others to understand a critical message or conundrum. This book, with its catalogue of visual archetypes – developed from practice experience – has been written for those facing this challenge, particularly those who may be working in organisations that do not have access to sophisticated information systems with advanced reporting capabilities. It has been developed with project, program and portfolio managers and directors, and their work in mind, and leverages the terminology and concepts of organisational project management. But the archetypes can be applied to far more diverse situations and I hope will be used by those outside project, program and portfolio management to help improve the way we communicate in organisations.

While this book draws on graphic design techniques, its aim is to empower non-designers to build a comfort with visual language that they may already have with the written word. My hope is that after reading this book managers will feel more confident in their ability to create the visuals they need to influence stakeholders and communicate important messages. Much of the discussion in this volume uses executive management or senior leaders as an example of project stakeholders. However, the principles discussed and archetypes provided can equally be used to engage project teams, reference groups or other stakeholder groups. This book can be a tool in your arsenal which helps you deal with the many challenges you face as part of the lived experience of project work. This book doesn't address big data or automated visualisation of an organisation's large quantitative datasets – while this is an important element of visualisation, there are numerous texts on this booming area. This book's focus is on sharing 'messier' data which is often qualitative and has traditionally been the domain of lengthy text-based documents.

If you are new to creating visuals it will take time to build confidence and capability and your initial attempts may lack the professional finesse you aspire to. Despite this, I urge you to persist, to take notice of the features of visuals that are impactful and clear, to practice (practice and practice), to seek feedback from your stakeholders, and over time your capabilities will improve. And you will reap the benefits!

Research increasingly reveals the importance of engaging stakeholders and conveying complexity in an understandable way in a world of 'information overload'. Creating visuals can increase your influence by improving the likelihood of your message or question being noticed and understood, and triggering a decision or action. Happy visualising!

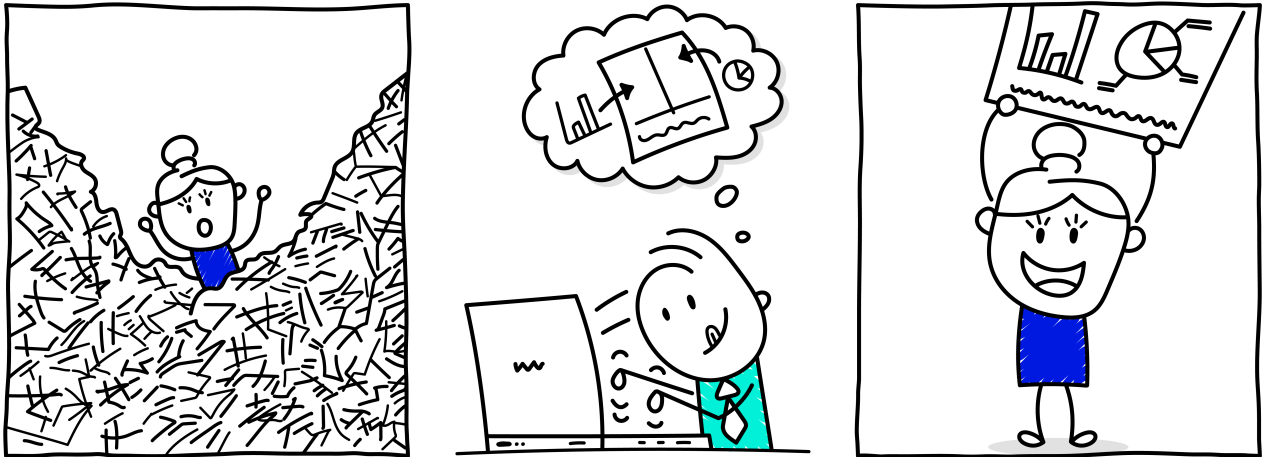
ABOUT THE AUTHOR

Dr Bronte van der Hoorn is a project management academic with a strong practice background. Her project management experience ranges from government, to finance, and education with a particular focus on stakeholder and change management. Bronte uses visuals extensively in her own work and alongside her research interest in this area, she is committed to supporting other project managers to build their visualisation skills. Bronte publishes in international peer-reviewed project management journals and presents her research at various forums across the globe. Bronte can be contacted at Bronte.VanDerHoorn@usq.edu.au.

PART A: GET VISUAL, BUILD INFLUENCE, DRIVE ACTION

There is a strong evidence base for using visuals in project work. **Chapter 1** outlines the book's purpose and rationale, and the key objectives of each chapter. **Chapter 2** presents a snapshot of the scientific basis for using visuals in communications. The chapter introduces concepts such as working memory and its limits, and includes a brief digression to consider the historical and cultural context which has given rise to visuals. **Chapter 3** provides a case for the use of visuals in project work. The chapter discusses the concept of sensemaking and the initial position of visuals as boundary objects, then provides examples of specific studies that explore the efficacy of visuals in project work.

1. A CALL TO VISUALISE



Young children love to draw. They have a confidence in expressing themselves that some might consider misplaced for their actual ability. A jumble of lines is proudly proclaimed to be a family portrait. However, for all but the most creatively inclined, as we grow older, we lose this confidence to draw – to express ideas visually. Research with project managers reveals that many do not feel they have the skills to visualise information, and their stakeholders comment that the ability to visualise is far from an inherent trait of the project manager, even though there is a growing preference for this type of communication (van der Hoorn, 2020).

The reluctance to visualise is unfortunate given we are in an era of information overload. The problem that information overload creates for decision-makers is aptly described as ‘a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it’ (Simon, 1971, pp. 40-41). Executives involved with projects are particularly vulnerable to this situation: not only are they time-poor, but sometimes they are required to make decisions outside their business as usual areas of expertise and will be held to account for these decisions (van der Hoorn, 2020). This creates a challenge for those seeking to engage or elicit decisions from these stakeholders. There is a need to prepare information in a manner that grabs stakeholders’ attention and conveys key messages efficiently and effectively. Visualised information can assist with this challenge. Human beings have limited working memory, but through the skilful visualising of information, our cognitive processing abilities can be enhanced (see **Chapter 2**).



1.1 Concept exploration: the power of visuals

At TEDGlobal in 2010 David McCandless presented on the power of visuals to portray the story or big idea in a dataset. He uses the phrase ‘data is the new soil’ to highlight the potential for visuals as a foundation for new understandings.



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://usq.pressbooks.pub/visualsforprojectmanagement/?p=5#oembed-1>

While the examples David shares are not related to project management, they highlight the potential of colour and space – amongst other elements of visual language – to communicate complex information and effectively compare different variables in a phenomenon. McCandless (2010) also draws attention to the way we are inherently attracted to visualised information.

The visuals presented in this book are static, two-dimensional and present information in a way that uses elements such as colour, space and scale to communicate meaning. All the visuals include text, but their design also leverages other elements of visual language (refer to **Chapter 5**). The archetypes have been designed as full-page examples. However, this should not preclude their inclusion in part or whole in more traditional documents or presentations. Using them can assist you to convey information in an efficient manner to your stakeholders to increase their understanding of complex project issues, to enable project boards and other senior stakeholders to make decisions, and to bring about engagement to drive action.

Visuals are not always superior to written or verbal information. As with all types of communication, understanding stakeholder preferences and information needs is essential to effective design (Geraldi & Arlt, 2015; Killen, 2022; van der Hoorn, 2020). However, the ability to communicate visually, and therefore reduce the time required for stakeholders to consume information and to leverage the full capacity of their working memory, can provide project managers with an advantage in influencing their stakeholders. Some types of information are particularly well-suited to visual representation. For example, comparisons; causality, mechanisms, structures, and explanations; and multivariate analysis (Tufte, 2006). Given the prevalence of discussions relating to time (i.e. structures), decision-making regarding delivery options or vendors (comparisons), and abundance of processes – from stakeholder analysis to risk and benefits management in project work (mechanisms), visuals can be particularly useful in this domain.

The need to influence is increasingly recognised as being at the core of project management. Research is now replete with examples of the insufficiency of technical skills – such as the ability to create a budget or schedule – alone to deliver projects. Rather, managing stakeholders, including the resolution of conflict, sensemaking, and bringing stakeholders into alignment, dominates the complex reality of being a project manager (Hoezen et al., 2013; Stevenson & Starkweather, 2010; van der Hoorn and Whitty, 2017a). Despite this recognition of the complex and human-centred nature of project work, education and training for project managers in these areas requires expansion (see, for example, Alam et al., 2010; Turner,

2016). The theories and practical tools provided in this book are a response to this call in an era that is synonymous with a visual turn in organisational life (Bell & Davison, 2013; Davison, 2015; Meyer et al., 2013). Specifically, the guidance on creating visuals (refer to **Part B**) and practical examples (refer to **Part C**) can provide much needed specificity to the generic guidance regarding communicating and engaging stakeholders in the time-pressured and messy world of projects.



1.2 Concept exploration: to visualise or not to visualise

Many project managers are already familiar with the advantages of using visuals to engage and influence their stakeholders. However, a simple quasi-experiment can reveal their power for those who are not yet aware of their potential.

Let's take a classroom of students, not necessarily those involved in project management, but aware of general business concepts. The class are informed that for the purposes of the experiment they are members on a project board and are being asked to understand and answer a question relating to the risk profile and duration of the activities that are to be undertaken. Half the class are given a single-page visual which shows the activities in a timeline style with annotations related to risk level. The other half of the class are given a text-only memorandum which describes the duration of the activities and their risk level in paragraph format. The two groups of students do not know they have received different types of documents from which to answer the question. Once all students have received their 'briefing document' and the question to answer, a timer is set and students are asked to raise their hand when they have a response to the question.

Each time this experiment is run, there are more students who received the visualised briefing document who have a correct answer to the question in the first five minutes than their counterparts who received the text-only memorandum. This is unsurprising given that to answer the questions (i.e. interpret the briefing documents), the students in the memorandum group essentially need to create a visual in their mind's eye to compare the activities to be able to answer the question. The group receiving the visual are not required to undertake this task of aggregating this information into a format to enable them to undertake the required task (answer the question). This result holds even when the students are unfamiliar with the style of the visual and receive no accompanying explanation from the facilitator.

This simple experiment, aligns with research that shows the importance of considering the purpose of communications and how we convey messages in a manner which are sympathetic to the needs (e.g. in this case making a particular decision which required a process of comparison) of the stakeholders (Gerald & Arlt, 2015; Killen, 2022; van der Hoorn, 2020).

For those interested in the potential of visualisation to influence stakeholders, this passionate video by Hans Rosling shows how data visualisation can be used to raise awareness of social issues and affect positive change. While the video has a big data leaning that is beyond the scope of this book, the key messages about using the data we have to build enhanced understanding of complex issues are still highly relevant



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://usq.pressbooks.pub/visualsforprojectmanagement/?p=5#oembed-2>

The power of visuals for influence cannot be underestimated, but is caveated. Latour (1986, p. 4) cautions visualising information does not guarantee understanding: depending on how visuals are used they ‘may explain almost everything or almost nothing’. However, the potential influence for visuals is so significant that it has been argued that the rise of modern scientific culture, with the respect and esteem it begets, can (at least partially) be attributed to the power of visualisation to disseminate findings (Latour, 1986). The term ‘immutable mobiles’ summarises the nine reasons that Latour (1986) argues gives visuals their power: visuals are easy to distribute and can also be used in various ways – for example, as a focal point during an informal meeting, included in reports, or incorporated into formal presentations. He boldly states (1986, p. 17) that those who visualise badly lose the encounter – their fact does not hold. He also argues that when someone is in doubt about facts or contradictory information they will lean back to an available visualisation. It is the aim of this book to build your skills and confidence to use visuals to increase the influence of your communications.

With this potential to influence comes accountability (Tufte, 2006) and it is imperative to be mindful of the trust that stakeholders place in visuals. The act of visualising is not neutral, and the choices made in presenting information necessitates omission of some details in favour of others (Borland et al., 2018). Similarly, the norms and style conventions of visualisation can be deliberately manipulated to mislead stakeholders through misrepresentation of a situation (e.g. a misleading axis to suggest an increase or decrease in value when the opposite is the case). There is also a responsibility to use reliable, complete and accurate data as the basis of visuals (Killen, 2022) – not always an easy task in the rapidly changing and uncertain world of projects. The use of visuals is also not about simplifying complex data, but rather as Tufte (1983, p. 191) summarises, to provide a ‘clear portrayal of complexity’.

This book has three parts and has been designed to enable you to navigate between the chapters depending on your interests and needs. **Part A** is largely theoretical and is for those looking for justification of the value of using visuals. For example, **Chapter 2** focuses on the scientific basis for using visuals in communications. It introduces the concept of working memory, its limits with a brief digression to consider the historical and cultural context which has given rise to visuals. **Chapter 3**, also theoretical, briefly reviews the case for visuals in project work. **Part B** provides practical advice necessary to cultivate your visualisation skills. **Chapter 4**, introduces software tools that can assist you to create visuals, and highlights that most practitioners will already have access to the necessary software for developing effective visuals. For those already creating visuals, it lists helpful web-based tools that can increase the efficiency and professionalism of your visuals. The norms and stylistic considerations (e.g. use of colour, iconography or scale) associated with visuals are outlined in **Chapter 5**. **Chapter 6** illustrates a process for creating visuals and provides tips relating to file types and managing the drafting of visuals.

Part C contains the 12 visual archetypes that you can adapt for your own purposes. These archetypes range from timelines, to comparisons, to hierarchies. For each archetype, examples of the type of data suited to presentation in the archetype is outlined, followed by instructions on how to adapt the archetype for your communication need. Two examples are provided for each archetype, along with annotations on the examples to reveal the design choices. The examples of each archetype can be downloaded as a Microsoft PowerPoint file for adaptation.

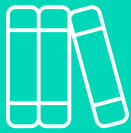
Being the project manager is challenging and requires an ability to engage, inform and influence stakeholders, ranging from your project team to your project board and even external parties who can influence your project's outcome for a variety of purposes that arise during project work. The ability to effectively visualise can give you the advantage to influence stakeholders in an environment where the capability to do so is more important than ever.



Chapter 1 summary

- Many project managers lack the confidence and capability to create visuals
- Project stakeholders are commonly time-poor and experience information overload
- Many types of information in project work are well suited to visualisation (e.g. comparisons; causality, mechanisms, structures, and explanations; and multivariate analysis)
- The skills to manage – inform, engage, influence – stakeholders is critical for project managers and the ability to create visuals can provide an advantage in managing project delivery

- Creation of visuals is not neutral and carries with it an accountability for appropriately representing information/situations



Recommended readings

Stakeholder management in project work

- van der Hoorn, B., & Whitty, S. (2017). The praxis of 'alignment seeking' in project work. *International Journal of Project Management*, 35(6), 978-993. <https://doi.org/10.1016/j.ijproman.2017.04.011>

Inspiration to cultivate your visualisation skills

- McCandless, D. (2012). *The visual miscellaneum: A colorful guide to the world's most consequential trivia*. HarperCollins.

Ethics in visualisation

- Borland, D., Wang, W., & Gotz, D. (2018). Contextual visualization. *IEEE Computer Graphics and Applications*, 38(6), 17-23. <https://doi.org/10.1109/MCG.2018.2874782>

Media attributions

Cartoon: designed by Samara Hoffmann licensed under a CC-BY-NC-SA licence.

2. THE SCIENCE OF VISUALS



If you are new to developing visuals, the creation of a visual will likely take you longer than presenting the same information in a text-based format. In this chapter we present a case for utilising visuals based on cognitive psychology. Hopefully, this encourages you to persist in taking the time to build your skills in creating visuals. The chapter also briefly reviews the archaeological and cultural aspects of visuals to highlight that the creation and interpretation of visuals cannot be separated from the cultural context in which they are used.

2.1 The limited working memory

The reason for using visuals becomes clearer when we understand the architecture of working memory. This section does not provide a comprehensive exploration of working memory (for more information on this, refer to the recommended readings at the end of this chapter), but simply explores how two slave systems within working memory – the phonological loop and visuospatial sketchpad – help explain the beneficial effect of visuals. Further, the concept of cognitive load is introduced and linked to the architecture of the working memory. Through appreciating the issue of limited working memory, the architecture of the working memory, and cognitive load you are better informed to make strategic choices in how you communicate with your stakeholders. These concepts are drawn from both cognitive psychology and instructional design – the design of educational materials.



2.1. Concept exploration: working memory under load

In 2013, Dr Peter Doolittle used the following exercise to help his TED audience discover the working memory and how it can be maximised.



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://usq.pressbooks.pub/visualsforprojectmanagement/?p=23#oembed-1>

In summary, first Dr Doolittle asked his audience to remember five words – no writing them down! Then, while remembering the five words, he asked them to undertake a series of tasks that put pressure on the working memory: performing a mathematical calculation and listing the five last letters of the alphabet (backwards)!

Note: As you read further in this chapter you will see that this dual-task exercise is the foundation for many experiments exploring working memory.

Commonly, those who can remember the five words and actually perform the two tasks have maximised their working memory by visualising the five words as an image. This image is held in the visuospatial sketchpad while the other tasks are performed in the phonological loop.

2.2 The architecture of working memory

Working memory is defined by Baddeley et al. (2020) as ‘a limited capacity system for the temporary maintenance and processing of information in the support of cognition and action’. The functioning of the working memory remains debated and is acknowledged to be continually evolving. However, the model presented here is that proposed by Baddeley and Hitch, which has broad acceptance and has significant influence in this field (Baddeley et al., 2020). Baddeley and Hitch’s model conceptualises working memory as an interface between sensory input and long-term memory (refer to **Figure 3.1**). The working memory holds information that enables a range of cognitive tasks to be performed. The working memory also transfers information into and from the long-term memory. Important to the argument for using visuals in project communications, working memory is limited (Chen & Kalyuga, 2020).

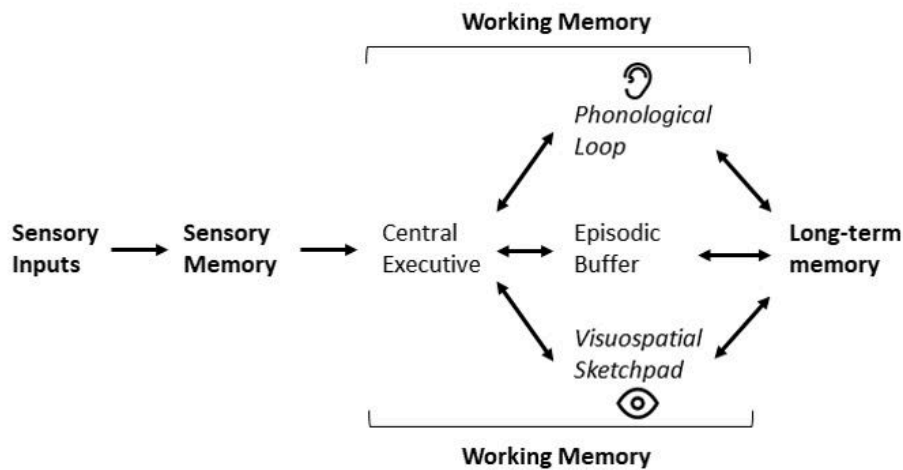


Figure 2.1:
Components of
the working
memory

Components of the working memory include the central executive, phonological loop, and visuospatial sketchpad (Baddeley, 2006). The central executive has limited capacity, is termed as an attentional control system and fulfils a coordinating function for the phonological loop and visuospatial sketchpad (Baddeley, 2006; Baddeley et al., 2020). The loop and sketchpad are sometimes labelled as subsidiary slave systems (Baddeley, 2006). The phonological loop holds and rehearses auditory and speech-based information (Baddeley, 2006). Visual information is stored in the visuospatial sketchpad (Baddeley, 2006). Both these slave systems have storage limits and capacity is not transferred across the systems. The episodic buffer is a fourth component of working memory but is less understood (Baddeley, 2006). The cognitive benefits of using visuals are attributed to the two distinct slave systems, and the fact that their capacities are not transferred.

Baddeley and Hitch's working memory arguably aligns with Paivio's dual coding theory (Thomas, 2021). According to the dual coding theory, visual information is more easily remembered than non-visual information in sequential memory tasks (Paivio, 1971). To elaborate using Paivio's early experiments, if a series of words are presented to a person in rapid succession, and then a series of images – *without* time for the person to 'name' the image – the sequence of words are remembered better than the sequence of images (Paivio & Csapo, 1969). However, when presented at such a pace that the person can 'name' the images, their recall of the sequence of images is approximately equal in accuracy to their recall of the sequence of words (Paivio & Csapo, 1971). It is important to highlight that these early experiments were focused on assessing capacity for storing *sequential* information. Paivio and Csapa's (1971) experiments also establish differences in recall depending on whether words refer to concrete objects or abstract concepts. This distinction is relevant to visualisation in project management where concepts being communicated are often abstract. Dual coding theory would espouse that the more 'concrete' the communication, the more likely the message is remembered.

Similar to Baddeley and Hitch's working memory architecture, and helping explain the naming of their theory, according to Clark and Paivio (1991), the human mind has two types of codes (representations): verbal and imagery. According to dual coding theory, retention and retrieval is enhanced when both a

verbal and imagery representation is created. That is, the memory is stored in two systems rather than just one. Paivio's theory is associated with the 'pictorial superiority effect' (Yang et al., 2017) and recent studies continue to find that when both images and text are utilised there is an increase in reader engagement (Yang et al., 2017). It is important to caution that while dual coding theory has influenced numerous aspects of psychology research, it is not without controversy, with counter perspectives including the 'propositional' theory and the 'common coding theory'.

2.3 Working memory and cognitive load


Cognitive load – more simply stated as 'mental effort' – is linked to depleted working memory (Chen & Kalyuga, 2020; Clark et al., 2006). Cognitive load theory has connections to the concept of the magical number of 7 ± 2 (see **Concept Exploration 2.2**) and is associated with John Sweller (Clark et al., 2006). When communicating, it is beneficial to decrease wasteful cognitive load and maximise the capacity of project stakeholders' working memory architecture. As demonstrated in Peter Doolittle's activity (see **Concept exploration 2.1**), a key mechanism for achieving this is through utilising the capacity in both the visuospatial sketchpad and the phonological loop (Clark et al., 2006). The benefits of utilising both systems is established in various studies. For example, if a person is asked to perform a primary task which utilises the phonological loop, and then a secondary task which also utilises the phonological loop, performance is compromised (Clark et al., 2006). However, if the primary task utilises the phonological loop and secondary task utilises the visuospatial sketchpad there is minimal adverse performance impact (Clark et al., 2006).



Concept exploration 2.2: limits and potential of working memory

In this short video [approx. 11 mins], Professor of Cognitive Neuroscience, Torkel Klingberg describes the limits of, but also potential to train the working memory. He briefly introduces the tendency to remember 7 ± 2 elements, but importantly reveals that game-like exercises are being developed to maximise working memory.



 One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://usq.pressbooks.pub/visualsforprojectmanagement/?p=23#oembed-2>

Cognitive load theory identifies multiple types of load. It is intrinsic load that is most relevant to the use of visuals. Intrinsic load is associated with the processing that *needs* to occur to achieve the communication goal (Chen & Kalyuga, 2020). However, through the use of visuals along with supporting auditory or textual information it is possible to manage this intrinsic load to maximise stakeholders' limited working memory. Extraneous load is associated with a processing burden that is superfluous to the communication goal (Chen & Kalyuga, 2020). Ideally, the choices made in the design of the visual should minimise extraneous load. Plainly stated, this reminds the project manager not to include information in their visual that does not support the message being communicated or the stakeholders' information needs.

2.4 Applied efficacy for the use of visuals

Chapter 3 explores the use of visuals in project management. However, professions beyond project management are also currently increasing the rate at which visuals are used to enhance performance. For example, in the medical profession, an experiment was undertaken with doctors which compared recall of patient data when it included pictorial and textual information compared to the use of no visuals (Wolch et al., 2017). It is normal for recall of patient data to fall over time. However, this decline was less for the doctors who viewed records with pictorial data. Visual management (VM) is a frequently discussed concept in production management research (Tezel et al., 2016), with foundations in the Toyota Production System (TPS) (Koskela et al., 2018). A component of VM is the use of sensory work aids – often visual in nature – to support the production process and continuous improvement. According to Tezel et al. (2016), VM can support transparency, discipline, continuous improvement, job facilitation, on-the-job training, creating shared ownership, management by facts, simplification and unification.

2.5 A historical and cultural perspective

In this chapter the discussion so far has been dominated by a cognitive psychology perspective of visuals with little reference to the archaeology or cultural aspects of visuals. Briefly, we digress to somewhat address this imbalance. The architecture of working memory that we have described, and facts such as sight being dependent on light and the anatomy of our eyes, are important to our understanding of how

visuals work and inform how we develop and use visuals (Janik & Kaner, 2018). However, the way we create and interpret visuals is reflective of our life histories and cultures (Janik & Kaner, 2018). When designing visuals this is an important acknowledgement and necessitates an appreciation of the potential interpretations stakeholders will bring to the visual. As will be discussed in **Chapter 5**, the meaning of colours is not universal: colours can have different meanings for people in different cultures (Aslam, 2006). For example, in Anglo-Saxon and Nordic cultures blue is interpreted as masculine, whereas it is associated with femininity in Germanic cultures. Red is associated with love or happiness in China, but fear, anger and jealousy in Slavic cultures (Aslam, 2006). The language of different nationalities also impacts how colour is classified. In some languages, for example Dani and Bassa, there are only two terms for colour: dark and light (Casaponsa & Athanasopoulos, 2018).

The use of visuals is also linked to broader societal developments such as available tools and technologies. In earlier eras, pictograms and ideograms, such as those associated with the Egyptians, fulfilled a significant role in storytelling (Dewan, 2015). The nature and use of such illustrations was linked to available resources to create these visuals. For example, it is suggested that the colour blue was not used by prehistoric artists because this pigment was not easily available (Janik & Kaner, 2018). In today's society it is the increasing availability of sophisticated software and screens that have advanced the use of visuals in diverse domains (Dewan, 2015). Latour (1986) associates visuals with our increasingly knowledge-based occupations. He argues that it is through what he terms 'inscriptions' that the competition of ideas plays out, and that visuals are a particularly effective form of inscription in this race and become sources of power in our societies. The ability of inscriptions to be mobile – spread/shared between people – scalable and reproducible among other features are central to their power (Latour, 1986). To summarise, when developing visuals and considering their use, we cannot separate them from the micro and macro cultural contexts in which they are used.

2.6 Maximising working memory for project stakeholders

Let's return to our primary focus of this chapter – the cognitive psychology of visuals – and apply the architecture of working memory to the project management context. Frequently, a project manager will need to engage with senior executives or managers who are not familiar with the day-to-day aspects of a project but need to provide approvals or make strategic decisions related to the initiative. In such situations, the project manager will often prepare some form of documentation followed by a verbal briefing in a meeting or phone call. For demonstration purposes, let's explore an example where the project manager's ultimate goal is to derive a decision on a supplier to fulfil a critical project requirement. Let's imagine that we could use two different communication approaches to this situation (refer to **Table 2.1**).

Approach 1:

The project manager could prepare a memorandum with no visuals that discusses the advantages and disadvantages of the multiple suppliers that are under consideration in a text-only format. There may be an expectation that the senior executive has read this in advance of the meeting and the project manager provides a recap in the meeting while pointing to various sections in the memorandum. At the end of the conversation, the project manager hopes the executive will provide a decision on the preferred supplier.

In this approach both the memorandum and conversation are placing load on the phonological loop, and not taking advantage of the visuospatial sketchpad. The working memory is not maximised.

Approach 2:

By contrast, the project manager could prepare a document that presents the comparison of the advantages and disadvantages of the multiple suppliers in a tabular format that makes identification of the recommended supplier more obvious. Certainly, there may be textual narration to summarise the table and an accompanying discussion, but this approach uses both the phonological loop and the visuospatial sketchpad to maximise working memory. Both systems within the working memory are being utilised.



Approach/ element	Utilises Phonological loop 	Utilises Visuospatial sketchpad 
Approach 1: Memorandum & discussion		
<i>Text-based memorandum</i>	✓	
<i>Discussion</i>	✓	
Approach 2: Memorandum with table & discussion		
<i>Memorandum with table</i>	✓	✓
<i>Discussion</i>	✓	

Table 2.1: Comparison of the two approaches with respect to the working memory slave systems

Now let's link these two approaches to cognitive load theory. The project manager's communication goal is to enable a decision on a preferred supplier. The intrinsic load for the executive is associated with making this determination. Through using the table in **Approach 2**, the executive's working memory is maximised and therefore the intrinsic load is reduced. In **Approach 1**, there is potential that the executive tries to create some form of table in his mind's eye (or on paper) to leverage the visuospatial sketchpad, but this is (unnecessarily) increasing the intrinsic load of the task. If the memorandum (or table, or discussion) included information superfluous to the decision at hand, this would be creating extraneous load. And should be avoided.

As is prevalent in psychological theorising, the models and theories presented here continue to be explored and tested, have limits and critiques. Nevertheless, they are presented here as an example of the current arguments for the benefits in utilising visuals.



Chapter 2 summary

- Working memory, which is essential for problem solving and decision-making is limited
- Working memory includes two slave systems: the visuospatial sketchpad (which holds visual information) and the phonological loop (which holds auditory and textual information)
- Cognitive load can be reduced by leveraging the limited capacity of *both* the visuospatial sketchpad and phonological loop
- The use, development and interpretation of visuals should take into account the cultural contexts in which they are used
- Project managers, through the strategic use of cognitive psychology insights and cultural norms, can enhance their communication



Recommended readings

On the architecture of working memory

- Baddeley, A., Hitch, G., & Allen, R. (2020). A multicomponent model of working memory. In R. Logie, V. Camos, & N. Cowan (Eds.), *Working memory: The state of the science*. Oxford University Press. <https://doi.org/10.1093/oso/9780198842286.003.0002>
- Klingberg, T. (2009). *The overflowing brain information overload and the limits of working memory*. Oxford University Press. [Ch. 3 – 6].

Designing communication to reduce cognitive load

- Clark, R. C., Nguyen, F., & Sweller, J. (2006). *Efficiency in learning evidence-based guidelines to manage cognitive load*. Pfeiffer. [Ch. 3].

Archaeology and cultural aspects of visuals

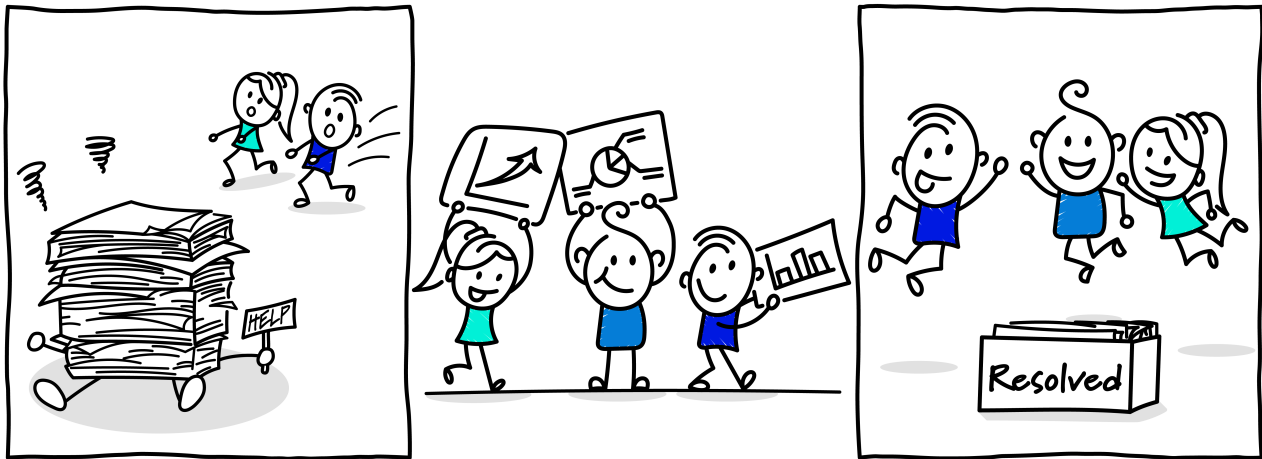
- Aslam, M. M. (2006). Are you selling the right colour? A cross-cultural review of colour as a marketing cue. *Journal of Marketing Communications*, 12(1). 15-30. <https://doi.org/10.1080/13527260500247827> [Table 1].

Media attributions

Figure 2.1: Adapted from Baddeley Working Memory Model by Laura Dahl licensed under CC-BY-NC licence, and originally inspired by Baddley and Hitch's works on working memory. This diagram has been created using an ear icon by iconsminds and an eye icon by Nguyen Van Sao, which are both licensed under CC-BY licence.

Cartoon: designed by Samara Hoffmann licensed under a CC-BY-NC-SA licence.

3. VISUALS IN PROJECT WORK



Building on the cognitive benefits of visuals presented in **Chapter 2**, this chapter presents the specific case for the potential benefits of visuals in project management. Project work has been described as a social and political process (Winter & Szczepanek, 2009). This challenging context requires the various stakeholders to make sense of the project world and to be in (sufficient) agreement to make decisions and move the project towards its objectives. Visuals can support this sensemaking process and this chapter introduces the historical foundations of the use of visuals in project work and then discusses recent studies that make a case for the use of visuals in project work. It concludes with reflections from project managers and executives on why visuals are particularly powerful in project work and the enablers required for project managers to communicate visually.

3.1 Sensemaking in project work

Many project practitioners expel significant effort in dealing with the sociopolitical complexity of project work. The concept of sensemaking can help us understand this complexity. Sensemaking is the process by which we derive the story, or make sense of a situation, based on various cues (Weick et al., 2005). The project environment, like all organisational environments, is replete with various sources of information (cues), and the possible interpretations of these cues is potentially as numerous as the number of stakeholders receiving the information. Much of the project manager's day can be spent trying to bring the various stakeholders, including project teams, project boards and other influential groups and individuals into alignment in terms of making sense of these cues and driving effort in the required direction (van der Hoorn & Whitty, 2017a). Given the potential cognitive benefits of visuals (see **Chapter 2**), it is unsurprising that visuals are commonly seen as a tool to support sensemaking, which often leads to decision-making in project work (see, for example, Ewenstein & Whyte, 2009; van der Hoorn & Whitty, 2017b).

Appreciating the process of sensemaking, and its importance in project work, is foundational to the development of effective visuals. Visuals, when appreciated through the sensemaking lens, have the purpose of assisting stakeholders to make sense of information to derive a story (or picture) of a particular facet of the project. Preparing effective visuals therefore relies on both understanding who will consume the information – and their preferences and priorities – and also understanding the various pieces of data and how they relate (see **Chapter 6**).

3.2 Visuals as ‘boundary objects’

The origins of the research on visuals in project management is found in the concept of boundary objects. Boundary objects are abstract or concrete artefacts – for example, plans and models in construction work, a project schedule, stakeholder matrix, or a list of project requirements – that meet the informational needs of various social worlds, and they are often visual in nature (van der Hoorn, 2020). Researchers have found that boundary objects can support negotiation (Alin et al., 2013; Di Marco et al., 2012), facilitate collaboration (Barrett & Oborn, 2010) and conflict resolution (Iorio & Taylor, 2014). Whilst boundary objects are commonly characterised as being ‘stable’ (unchanging), some researchers note that the very adaptability and potential evolution of such objects can help to move forward conversations and evolve knowledge in the project context: the visuals have agency (Comi & Whyte, 2018; Ewenstein & Whyte, 2009; Whyte, 2008).

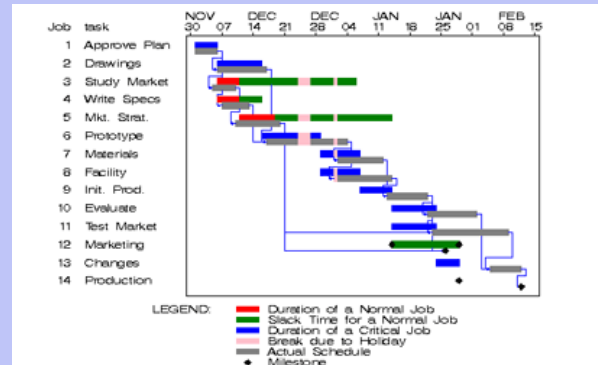
Relating this concept of visuals having agency (power) in the project environment to the sensemaking processes it becomes evident that those who craft visuals exert significant influence on the sensemaking process. Returning to the term ‘boundary object’, visuals mediate between source information and those who are interpreting the information. It reminds us of the care to be taken when developing visuals and the way we as project managers creating visuals influence the sensemaking processes.



3.1 Concept exploration: Gantt charts

For many people, the Gantt chart is a visual that is synonymous with project management, but did you know that the Gantt chart, and more precisely its predecessor the Harmonograph is synonymous with scientific management and operational work (Debicki, 2015)?

There is now increasing recognition that our connection of the Gantt chart with project management is problematic. The Gantt chart presents project work as being predictable and linear, as if it were 'operational' (Robles, 2018). This has the tendency to set unrealistic stakeholder expectations regarding the way the work will unfold and can be managed.



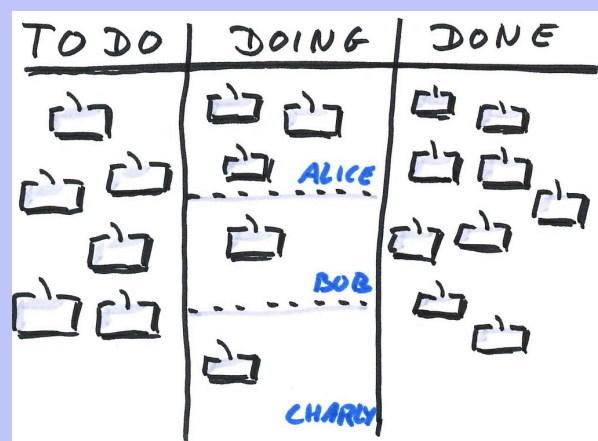
Research studies find that some project managers are aware of this conundrum and recognise that its worth is not necessarily in managing the work, but rather as a tool for helping build the confidence of stakeholders, or to meet their expectations of what project management entails (Whitty, 2010).

Even though project managers may feel frustration that they are expected, or perhaps even forced to use Gantt charts, they also manipulate this situation to their advantage and use Gantt charts to placate senior management and clients (or use high-level versions of a Gantt chart, for example, **Archetype 4**). As one project manager expressed, 'It's the Gantt charts that keeps my manager out of my office so I can get on with my work' (Whitty, 2010).

This does not mean that visuals don't have a place in scheduling and managing completion of activities within an initiative. Quite the opposite. Agile methodologies use Kanban-style boards as a central coordinating and tracking device to manage the team's workflow, in the short to medium term. When used, for example, as part of the Scrum methodology, they are a visual tool that forms part of a broader system for holding team members accountable. For those interested in this style of work coordination there are several software options available including:

- Kanban
- Trello
- Atlassian (Jira)

To summarise, when creating visuals we are deliberately or inadvertently communicating messages about a situation or choice through our design choices. For the Gantt chart, the neat lines, running from left to right in parallel rows down the page infer structure and order. It's no wonder the Gantt chart is seen as a tool to build stakeholder confidence, even if it doesn't directly enable project managers run their projects, and



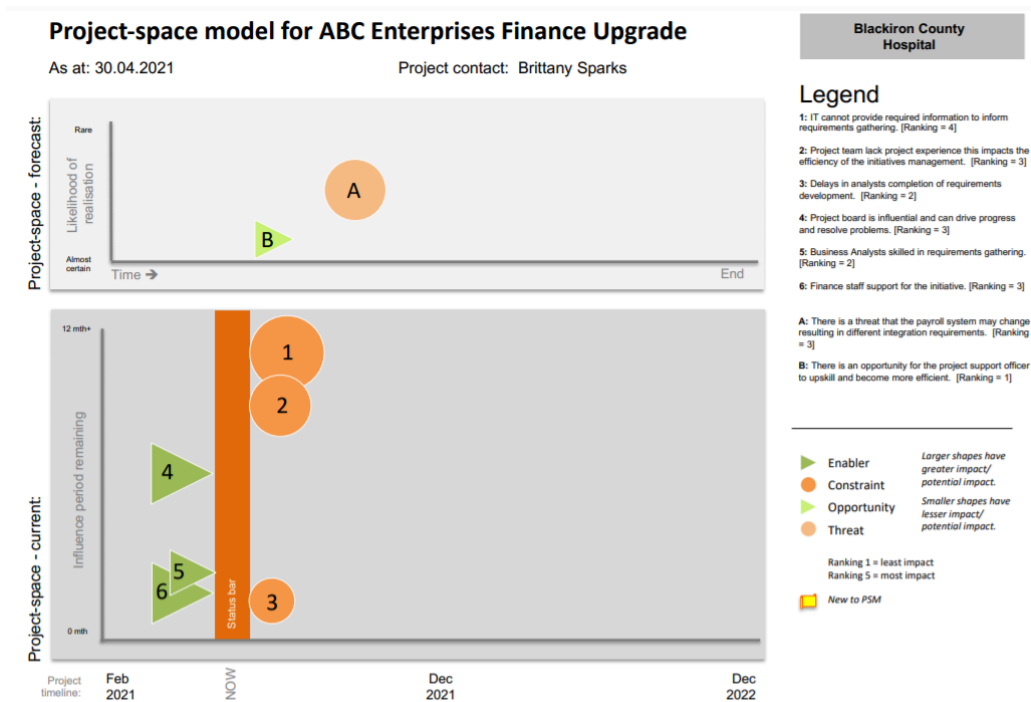
perhaps bends the truth of how the project will actually unfold. In the case of the Kanban board, attention is drawn to whether tasks on the board are moving at the expected rate, as agreed between members of the project team. As we will explore further in **Chapter 5**, visual language is powerful, and we need to be careful about the subtle inferences that can result from our visualisations.

3.3 Examples of using visuals in project work

Research on the use of visuals in management is still in its infancy (Beynon-Davies & Lederman, 2015; Davison, 2015; Goransson & Fagerholm, 2017; Maire & Liarte, 2018). However, there are an increasing number of studies that discuss the benefits of visuals in project work. The first discussed here is an example of a contemporary project management tool, the project-space model, that is used to support sensemaking on project status. The second example explores the use of visualised dashboards and maps in project portfolio management (PPM).

Discussing status with the project-space model

The project-space model (refer to **Figure 3.1**) has its theoretical foundations in Kurt Lewin's force field analysis (Burnes & Cooke, 2013) which in simple terms, characterises action as being the result of competing forces (factors): a situation changes because one force is greater than other(s) (van der Hoorn, 2016b). The project-space model maps, in a visual manner, the current and potential enablers and constraints to a project's progress (van der Hoorn, 2016b). The enablers and opportunities are factors that are currently or could potentially drive the project forward. Whereas constraints and threats are factors that are currently or could potentially hinder project progress.



Note: A higher resolution file of the project-space model is also available.

Findings of an action research study of a large in-flight project revealed that the project-space model supported strategic and integrated sensemaking of project status at project board meetings (van der Hoorn, 2016a; van der Hoorn & Whitty, 2017b). Prior to the introduction of the project-space model the board had used traditional dashboard reporting and other text-based reports to discuss project status at its board meeting. Following use of the project-space model, project board members and the project manager reported that they felt better able to discuss the most pertinent factors influencing status in an integrated manner (van der Hoorn, 2016a). Through the scaled icons representing enablers, constraints, opportunities and threats the most influential cues were given attention during board discussions.

To summarise, in moving beyond traditional text-based reports and leveraging the design opportunities that visuals present, the project manager felt better able to communicate the project's status and the project board perceived that their collective sensemaking capabilities were enhanced.

Visualised dashboards and maps in portfolio decision-making

The use of visuals in project portfolio decision-making was subject to a Project Management Institute (PMI) and University College London (UCL) funded research project (Gerald & Arlt, 2015). PPM is argued to be an important domain for the application of visuals in project communication given the complexity of decision-making related to portfolios. For example, PPM decision-making needs to take into account interdependencies between projects, uncertainty and unavailability of information related to projects, and the sociopolitical complexity of joint decision-making processes (Gerald & Arlt, 2015). Well-designed visuals are found to support decision-makers in managing this difficult decision-making context.

The PMI and UCL research project aimed to answer the question: 'how to use and design visuals to support cognition of data in portfolio decisions?' (Gerald & Arlt, 2015). The study was executed with 204

student participants who were asked to make PPM decisions using various dashboards. The dashboards had varying degrees of incorporation of the principles that the researchers hypothesised would support PPM decision-making: (1) interactivity, (2) purposefulness, and (3) truthfulness, efficiency and aesthetic (refer to **Figure 3.2**).

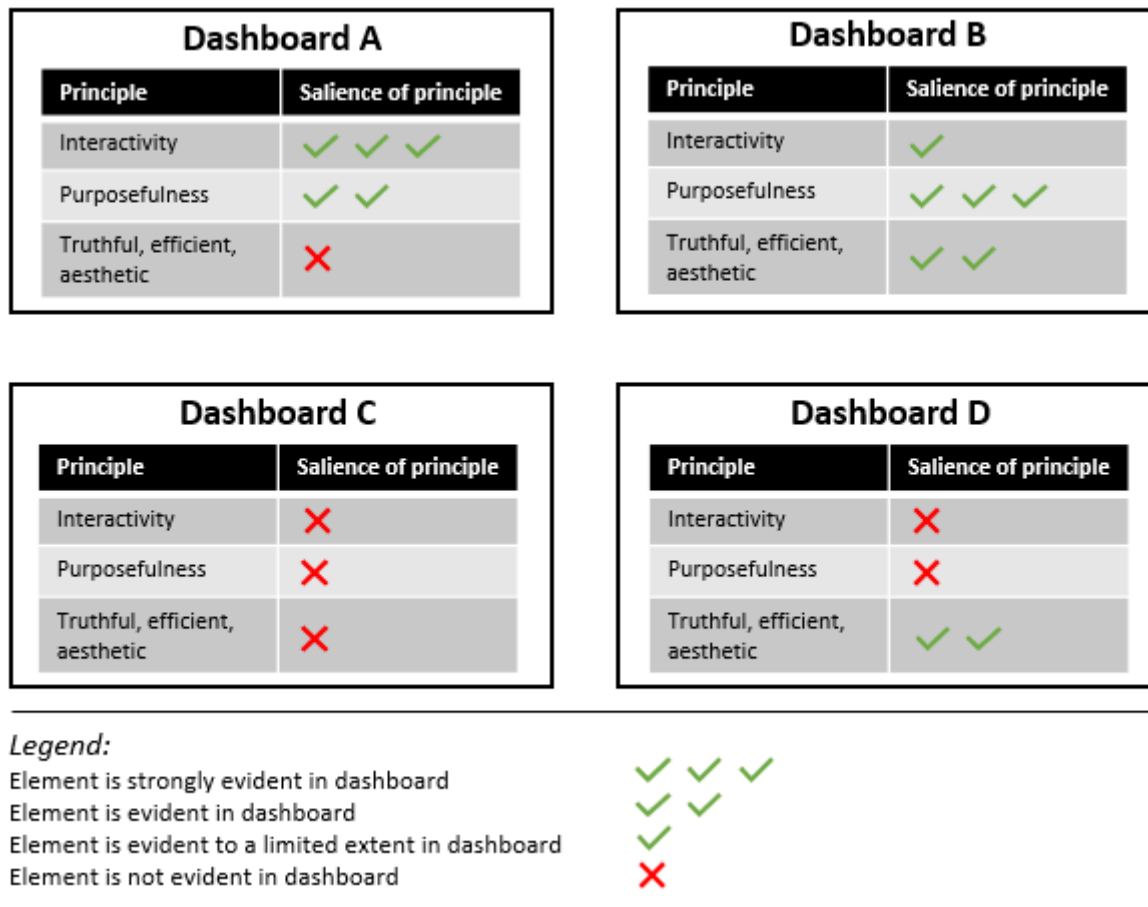


Figure 3.2: Gerald & Arlt (2015) Study Design with Four Dashboards

Evidencing the benefits of using well-designed visuals to support decision-making, Gerald & Arlt's (2015) study found that:

- adhering to the hypothesis design principles – particularly interactivity and purposefulness – leads to improved cognition
- the design of visuals needs to take into account the various perspectives that may be required to inform the decision-making
- consumers of visuals become familiar with particular visuals – be cautious (and incremental) when changing visuals and introducing new visuals.

A specific example of a visual in project portfolio decision-making with established benefit is the visual project map (Killen, 2022). A key strength of this visual is the representation of dependencies between projects. The ability to identify dependencies is central to portfolio decision-making and the visual project

map exemplifies the benefits that visual representation can provide compared to narratives (or even tables). The visual project map is particularly useful in enabling decisionmakers to see the connections between initiatives and how the decision to include a project within a portfolio needs to be undertaken with reference to the other initiatives upon which it depends and for which its deliverables are a pre-requisite (Killen, 2022).



3.2 Concept exploration: visual project map

The visual project map allows decisionmakers to see the interdependencies between images. Take a look at slide three on this presentation for an example visual project map.

For a more scholarly exploration of the visual representation of project portfolio data, see Killen, C. P. (2017). Managing portfolio interdependencies: The effects of visual data representations on project portfolio decision making. *International Journal of Managing Projects in Business*, 10(4), 856-879. <https://doi.org/10.1108/IJMPB-01-2017-0003>.

3.4 The project managers' and executives' perspective on visuals

Senior managers or executives have a powerful influence on the sensemaking that arises from a set of cues. The two research studies presented above provide evidence of the benefits of using visuals in project work. However, recent research reveals the situational factors (the why) that make visuals particularly useful for engaging executives in project work (van der Hoorn, 2020). The study also derived a list of enablers that are necessary for project managers to be able to create visuals that are valued by senior managers and executives in project work.

In interviewing executives with experience in project work, van der Hoorn (2020) reveals that these key stakeholders are subject to a variety of dispositions or conditions that make visuals a useful tool to support their sensemaking and subsequent decision-making. For example, many executives reported that they may be required to provide direction/decisions for a project that is not within their primary area of expertise. As such, visuals can support them to understand new concepts and ideas with speed. Similarly, the majority of executives comment that they are under continuous time pressure in an environment of information overload, and they require information presented in a way that enables them to reach decisions quickly. Interviewed executives also reported benefits in the way that visuals supported them to onward

communicate key messages relating to the project. Having a visual to take to a meeting with their senior colleagues or external stakeholders enabled them to more accurately share the story that needed to be communicated.

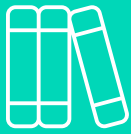
While these conditions facing executives influenced their desire for project managers to use visuals, the interviewees broadly agreed that the ability to visualise information was not a widespread project management competency, and many project managers did not necessarily appreciate the executives' information needs. The interviewed project managers concurred and identified various enablers and hindrances to creating visuals that meet the needs of their executives. For example, skills in visualising are not commonly taught as part of project management education and this effects project managers' confidence to visualise. Project managers also perceive that they are hindered by their organisations not providing the necessary software to create visuals nor direction on any standards for creating visuals. The interviewees noted information challenges that while not only relevant to visual communication are pertinent in creating truthful visuals. Sometimes it is not possible to get accurate or current data, and there are occasions where project managers feel being honest would have adverse repercussions.

This study highlights that whilst many executives will be disposed to appreciating visuals, many project managers feel ill-equipped or unsupported to communicate using visuals.



Chapter 3 summary

- Sensemaking is the process of creating meaning from various cues in an environment about a situation – it is a key activity in project work
- Visuals can be described as boundary objects – a term used for artefacts that meet the information needs of various social worlds and can support sensemaking
- Research studies are increasingly reporting the benefits that visuals provide to support project work
- A number of conditions dispose executives to preferring visualised communication
- Project managers require various supports to enable them to be able to effectively create visuals that meet the needs of their stakeholders



Recommended readings

Sensemaking

- Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization Science*, 16(4), 409-21. <https://doi.org/10.1287/orsc.1050.0133>

Benefits of visuals in project work

- van der Hoorn, B. (2016). Discussing project status with the project-space model: An action research study. *International Journal of Project Management*, 34(8), 1638-57. <https://doi.org/10.1016/j.ijproman.2016.09.001>
- Geraldi, J. G., & Arlt, M. (2015). *Visuals matter! Designing and using effective visual representations to support project and portfolio decisions*. Project Management Institute.

Media attributions

3.1 Concept exploration Image by Jean-Louis Zimmermann used under CC BY licence.

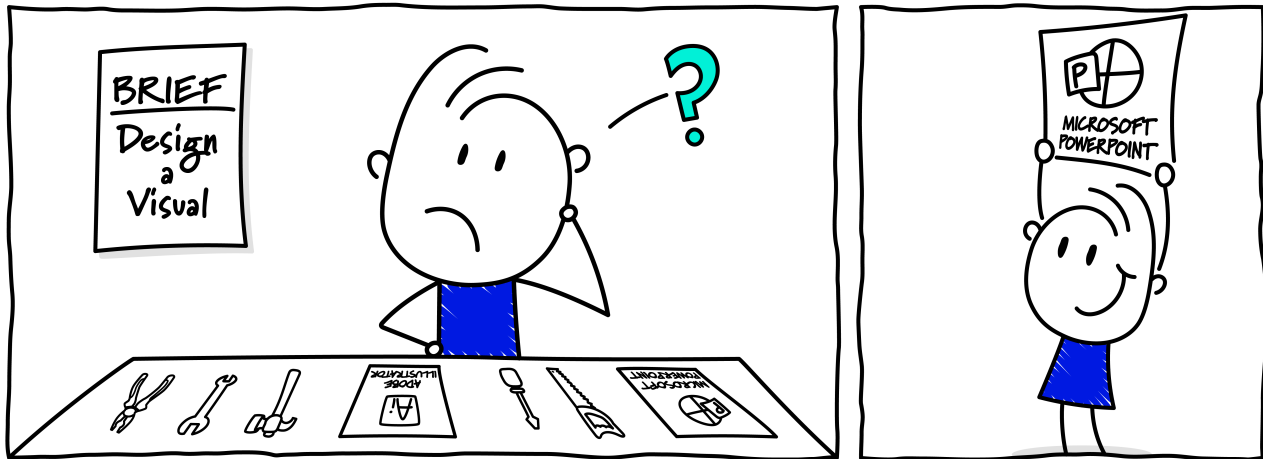
3.1 Concept exploration Kanban board by O.Tacke used under CC0 licence.

Cartoon: designed by Samara Hoffmann licensed under a CC-BY-NC-SA licence.

PART B: VISUAL FUNDAMENTALS

The following three chapters provide practical advice for cultivating your visualisation skills. **Chapter 4** introduces software that can assist you with creating visuals. It highlights that most practitioners will already have access to the necessary software for developing effective visuals. For those already creating visuals, it lists helpful web-based tools that can increase the efficiency and professionalism of your visuals. The norms and stylistic considerations – e.g. use of colour, iconography, scale – associated with visuals are outlined in **Chapter 5**. **Chapter 6** illustrates a process for creating visuals and provides tips relating to file types and managing the drafting of visuals.

4. TOOLS FOR CREATING VISUALS



Many project managers believe they lack easy access to the right software for creating effective visuals. However, this chapter will show that in most cases they already have access to the appropriate tools to create visuals similar to the examples in **Part C**. Instead, the key to success is often building confidence in their design skills by practising the processes and principles outlined in **Chapter 5** and **Chapter 6**. **Table 4.1** summarises the advantages and disadvantages of the software packages discussed in the first part of this chapter. The second part of this chapter introduces supporting tools that can bring efficiency and a professional style to your visuals.

This chapter doesn't address the growing number of tools available for big data visualisation or those that are particularly well-suited to quantitative data analysis (e.g. Microsoft Power BI, Jira, and even Microsoft Project or Excel – a quick web search will provide further information on such tools). If your organisation affords you access to such tools, these can be invaluable for presenting information that has already been captured in an information system, particularly in terms of portfolio management, or in the case of Jira for agile project teams. Commonly, they also have interactivity embedded within them that can quickly show different views of the data. However, as this chapter, in conjunction with **Chapter 5** and **Chapter 6** outlines, even if you do not have such sophisticated information systems and reporting tools, you can still generate visuals that will have influence.

Association	Microsoft PowerPoint	Adobe Creative Cloud	Infographic Web Applications
Ease of use	👍	👎	👍
Cost-effectiveness	👍	👎	varies
Flexibility	👎	👍	👎
Enforces styling	👎	👎	👍
Data security	👎	👎	👎
Collaboration potential	👍	👎	👎

Table 4.1: Comparing the advantages and disadvantages of software packages for creating visuals

Legend

- 👍 Favourable appraisal
- 👎 Neutral appraisal
- 👎 Unfavorable appraisal

Note:

These appraisals do not account for your personal or organisational circumstances. Particularly with respect to data security and cost-effectiveness. Seek the advice of your ICT team before deciding.

4.1 Software for creating visuals

Microsoft PowerPoint

Microsoft PowerPoint – or similar packages such as Google Slides – can be an effective tool for designing visuals. Many project managers already have some skills in these presentation packages which eases the learning curve. Such software also increasingly includes functionality such as SmartArt, which enables the rapid creation of mini-graphics for inclusion in your visuals (refer to **Figure 4.1 (a)**). If such software is included in an organisation’s standard software suite, there are no additional costs or software deployment time frames. If PowerPoint is part of the organisation’s standard software it also enables the editable version of visuals to be easily shared throughout the organisation (if required).

Presentation packages provide sufficient flexibility for the vast majority of project visuals. The visuals in **Part C** of this book were created with only Microsoft Office – primarily PowerPoint.

However, care must be taken to adhere to the principles outlined in **Chapter 5** and to leverage tools such as the application’s embedded colour palettes (refer to **Figure 4.1 (b)**). Otherwise, this flexibility can result in visuals that lack a professional presentation and consistent visual style. While these presentation packages are easy to use, it may take more time to achieve a professional look than with some of the infographic packages available online.

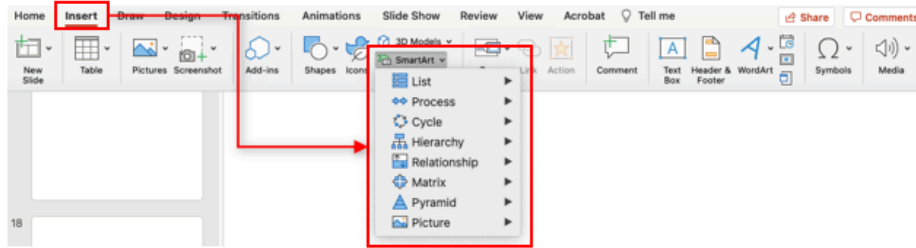
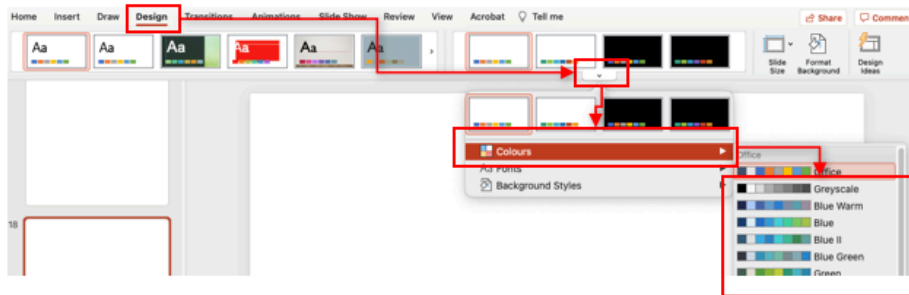
(a) Accessing SmartArt objects

Figure 4.1:
PowerPoint
tools to support
effective
creation of
visuals

(b) Accessing PowerPoint's standard colour palettes

Adobe Creative Cloud

Graphic design packages targeted at designers and media specialists like Adobe Creative Cloud can also be used to create project visuals. These suites offer maximum flexibility and artistry but require some training – or existing graphic design experience – to build confidence in effectively and efficiently creating visuals that have a professional appearance. In many organisations, access to these packages will require a special software request and/or additional cost. Even if you can gain access, this could limit the sharing of editable versions of the visual among colleagues, who may lack the skills to use the software themselves. Unless you already have skills in these packages or have a keen desire to build your graphic design capabilities, Microsoft PowerPoint or its equivalent are recommended as a starting point.

Infographic packages

There are an increasing number of web applications that support visualisation capability. These web applications (refer to **Concept exploration 4.1** for examples) have both advantages and disadvantages compared to Microsoft PowerPoint and Adobe Creative Cloud. Their greatest strength is that they're easy to use, offering a relatively quick learning curve. Infographic packages also commonly have templates which help in achieving a professional and consistent look with minimal effort. However, these structuring and styling features also limit the flexibility of the visual's design. You may find it difficult to replicate some of the archetypes in **Part C** of this book (or other custom designs) in such web applications. However, if you are building something from scratch, particularly if it is primarily using quantitative data these can be a time-efficient tool to generate visuals that have a professional appearance.

Additional limitations to consider include cost-effectiveness, collaboration potential and data security. For applications offering tiered plans, you may also need to consider the range of features that can be accessed at each subscription level. It's common for a free version of a web application to limit features and/or the number of visuals you can create. Generally, these limits are progressively removed as the subscription (fee) level increases. Always check the print/export capabilities of the web application before commencing work on your visual. Make sure you can print/export the visual in the format you require and at an appropriate resolution. It's also common that you will require a paid subscription to access collaboration tools. As such, if budget constraints are an issue and you require others to be able to edit your visual, you may prefer to use an application which is already used across your organisation. Depending on the nature of the visual, the data it contains may be sensitive. If this is the case, ensure you are aware of your organisation's data storage/protection requirements and that the web application aligns with these needs. Also be aware of whether the level of subscription you are using makes your visual public – in most cases you will want to ensure the privacy of your work and may need to review and adjust your account settings.



4.1 Concept exploration: online infographic packages

There are an increasing number of web applications that are designed to enable the rapid creation of visuals – see the table below for example web applications with weblinks and introductory videos. These applications are constantly evolving, therefore it's necessary to review and evaluate their functionality and any associated subscription fee at the time you're planning to use them. You can complement your own evaluation of their suitability with a web search for reviews on the web application. Always make sure to check the privacy settings for your work and ensure that you are comfortable with the web application's data storage protocols. Click on the drop-downs below to access the relevant websites and introductory videos of these web applications.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=29#h5p-7>

4.2 Software to support the design process

Support your learning curve with Google

Irrespective of your chosen software package, web resources like YouTube are an invaluable source of learning to build software skills. A quick Google search on a software problem you're facing will normally return a multitude of text and video-based resources. For example, if you're new to using the hierarchy SmartArt mini-graphic in PowerPoint, simply type "SmartArt" AND "hierarchy" AND "powerpoint" into your preferred search engine and you'll receive numerous sets of instructions on using this feature. Similarly, if you're unsure how to change the page layout from landscape to portrait, search "change page orientation" AND "powerpoint". You can also filter your search results to "video" if you prefer this way of learning. For those requiring more comprehensive skills development, try using the many getting started resources that are also freely available online. For example, search "powerpoint" AND "getting started".

The power of a Google search

A Google search is also a great source of inspiration for visuals and for mini-images or icons. For example, perhaps you're looking for a schedule that is different to the samples presented in **Part C** of this book. Search "project schedule" AND "infographic", and then filter the search to "images". A similar approach can be used if you're looking for an icon. For example, search "project schedule" AND "icon" and filter by "images". If you're planning to include the icon in your graphic, choose an icon that has appropriate permissions – for example, Creative Commons – by filtering on "usage rights" (refer to **Figure 4.2**). If you need to overlay the icon on a coloured background, also filter on 'transparent' under the colour menu to enable the background colour of your visual to be visible when you overlay the icon. Select the preferred icon or image and save this as an image file for inclusion in your visual.

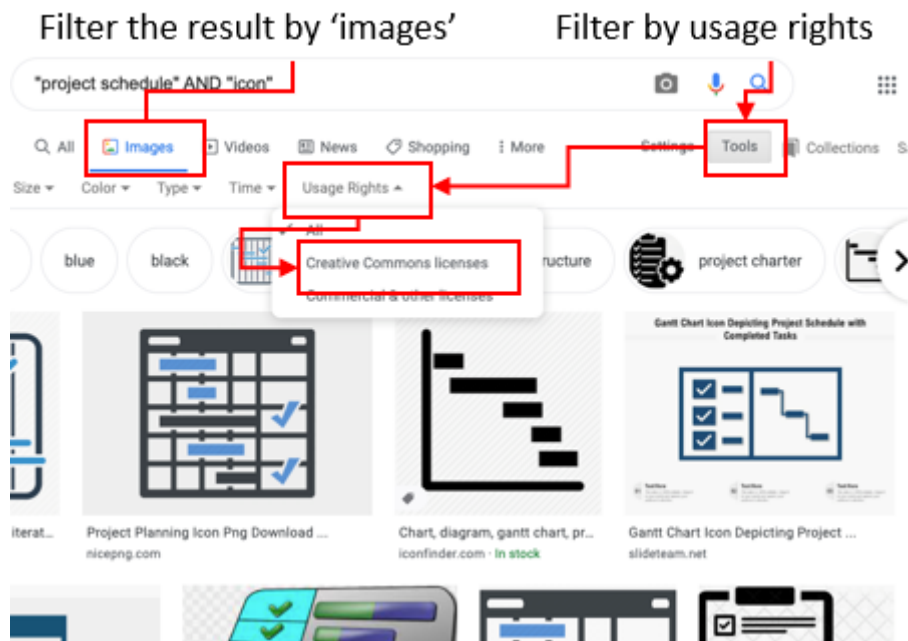


Figure 4.2: Using Google search tools to support design

Design tools

In **Chapter 5**, the use of iconography and colour are discussed. Below are two examples of tools that can support the effective use of these elements in visuals. If you are creating a large number of visuals you may choose to subscribe to an icon library like the Noun Project. These online libraries provide a catalogue of searchable icons which can make finding good quality icons fast and easy. Some catalogues – including the Noun Project – also enable you to rotate, flip or change the colour of icons before you download them.

Adobe Color is a free online tool that can support selection and use of colour. This tool enables you to nominate a colour and then explore harmonious colour palettes – for example, analogous, monochromatic, triad or complementary. This tool also has a searchable library of colour palettes if you're seeking inspiration. If you find a colour palette you would like to use, note the HEX code (the number starting with a #) of each colour in the palette and then add each of these colours into the software package in which you are developing the visual (refer to **Concept exploration 4.2** for more detailed instructions). A similar process can be used to add your organisation's corporate colour palette (refer to **Chapter 5** for more information) into your preferred software package for inclusion in a visual.



4.2 Concept exploration: setting up a colour palette

Build your skills in using Adobe Color by watching these short segments from this Adobe Color introductory video:

- Using the colour wheel to create harmonious palettes (03:34–05:00)
- Creating a palette from an image (05:00–06:23)
- Exploring colour themes (07:29–08:40)

You don't need to be using the Adobe Creative Cloud suite to explore Adobe Color palettes. Simply note the HEX code (refer to **Figure 4.3 (a)**) and add this as a colour(s) in the application you're using to develop the visual (for example, **Figure 4.3 (b)**).

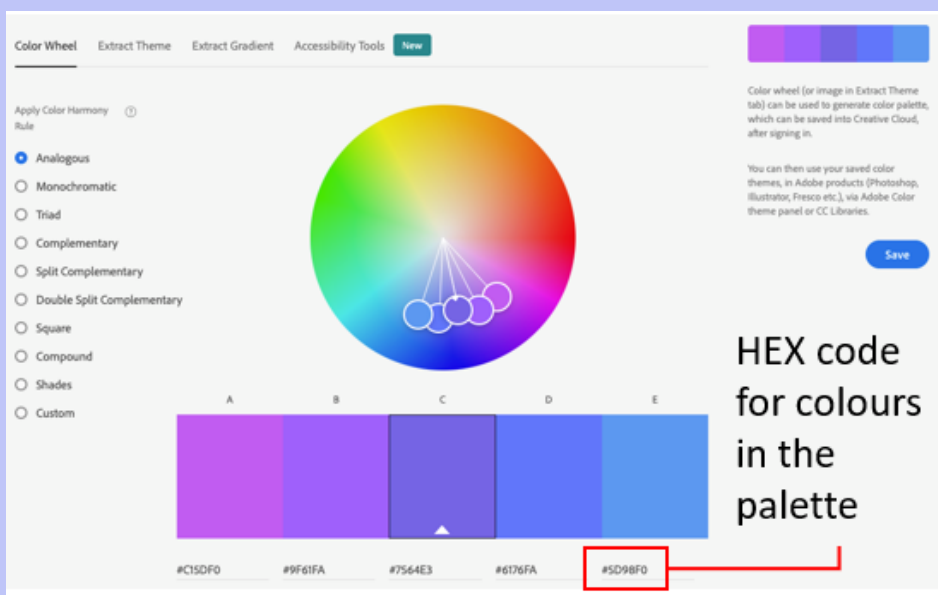


Figure 4.3 (a): Identifying the HEX code in Adobe Color palettes.

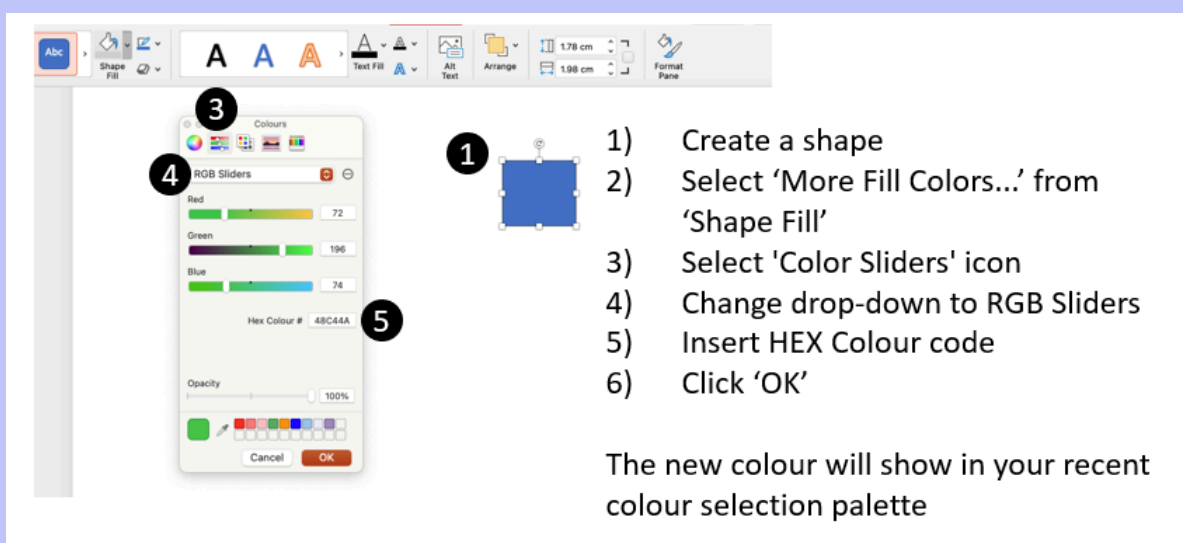


Figure 4.3 (b): Adding a colour by HEX code in PowerPoint



Chapter 4 summary

- Software is only one component of successfully designing visuals for project work – refer to **Chapter 5** and **Chapter 6** for further information on stylistic considerations and the design process
- There are a number of software applications available which can support the creation of visuals
- Microsoft PowerPoint – which is easily available in many organisations – is suitable for creating visuals similar to those in **Part C** of this book
- Seek the advice of your ICT team before using web applications – particularly in terms of data security, privacy and subscription costs
- Google search functionality can assist you in finding inspiration for your visuals and sourcing icons
- There are web tools such as the Noun Project and Adobe Color which can enhance the professional styling of your visuals



Recommended reading

Using Microsoft PowerPoint

- Lacher, M. (2019). *Business computers 365*. Minnesota Libraries Publishing Project. <https://mlpp.pressbooks.pub/businesscomputers2019/> [Sections: PowerPoint Chapter 1].

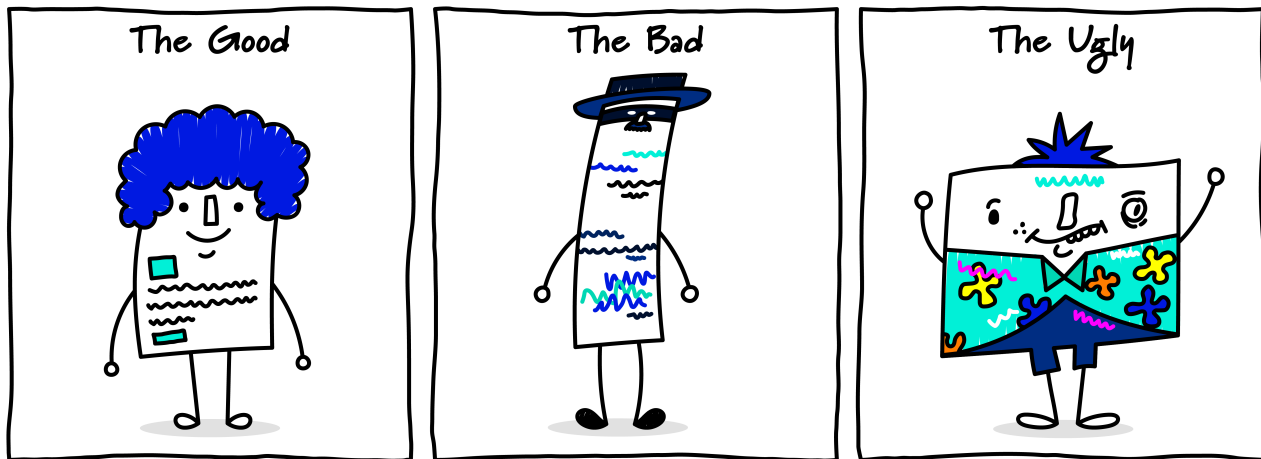
Media attributions

Table 4.1 Thumb icons by Starter Icons Collection from the Noun Project used under CC0 licence.

Figure 4.3(a) Adobe product box shot reprinted with permission from Adobe as per their terms and conditions.

Cartoon: designed by Samara Hoffmann licensed under a CC-BY-NC-SA licence.

5. VISUAL NORMS AND STYLING



Having some graphic design knowledge will improve the the visuals you create for your project stakeholders. This chapter explains basic design elements such as page layout, colour, iconography and shapes, and text. These elements form a palette of tools that are a visual vocabulary (Phillips & Phillips, 2014; Poulin, 2011). Most of us already feel comfortable using verbal and written language (text). This chapter provides a very brief introduction to visual language, and also how to align common charts and graphs with data types. For more information on graphic design elements and principles, refer to the **Recommended reading** list at the end of this chapter. The archetypes in **Part C** highlight the use of some of these elements.

5.1 Page layout

The blank page you start out with is a plane on which you will organise elements – such as text, shapes, icons, etc. – to create meaning (Phillips & Phillips, 2014; Poulin, 2011). Prior to starting to design a visual, consider how the visual will be read: onscreen or on paper. This will influence the *page size* you choose, and therefore the scale of text and other objects. For example, avoid setting up a visual on an A3 page if the visual is likely to be read on a phone or needs to be printed by stakeholders who only have access to an A4 printer – the content will become very difficult to read once scaled down! The decision on page orientation – landscape versus portrait as shown in **Figure 5.1** – will depend on what you are communicating. The archetypes in **Part C** provide advice to help you decide whether portrait or landscape orientation is more appropriate.



Figure 5.1:
Landscape and
portrait layouts

It can be useful to lay a temporary or even imaginary grid on your page to help align the elements. Many applications have tools that help you do this. Aligning elements vertically and horizontally (refer to **Figure 5.2**) brings ‘order’ and professionalism to visuals (Poulin, 2011). Being mindful of a ‘grid’ can also assist in equally distributing ‘space’ across the page. If there is insufficient white space on the page the visual can appear crowded and the message can be compromised. You can avoid overcrowding by ensuring there are sufficient margins around the edge of the page. This will also prevent content from being ‘cut off’ during printing.

(a) Examples of alignment and consistent spacing of elements**(b) Examples of lack of alignment and inconsistent spacing of elements****Figure 5.2: Alignment examples**

To reap the benefits of visuals, it is important that common norms relating to page layout are observed. For example, people in Western cultures read from top to bottom, left to right. Another example might be that we conceptualise time as going from left to right. Therefore it is customary to place earlier time periods on the left-hand side of page and later time periods on the right-hand side of the page. A similar norm applies to process flows. If the flow cannot be presented visually across the page from left to right, then it is preferable to go from top to bottom. It is also standard practice when representing numeric values to present larger values as being higher on the page or further to the right (refer to **Figure 5.3**).

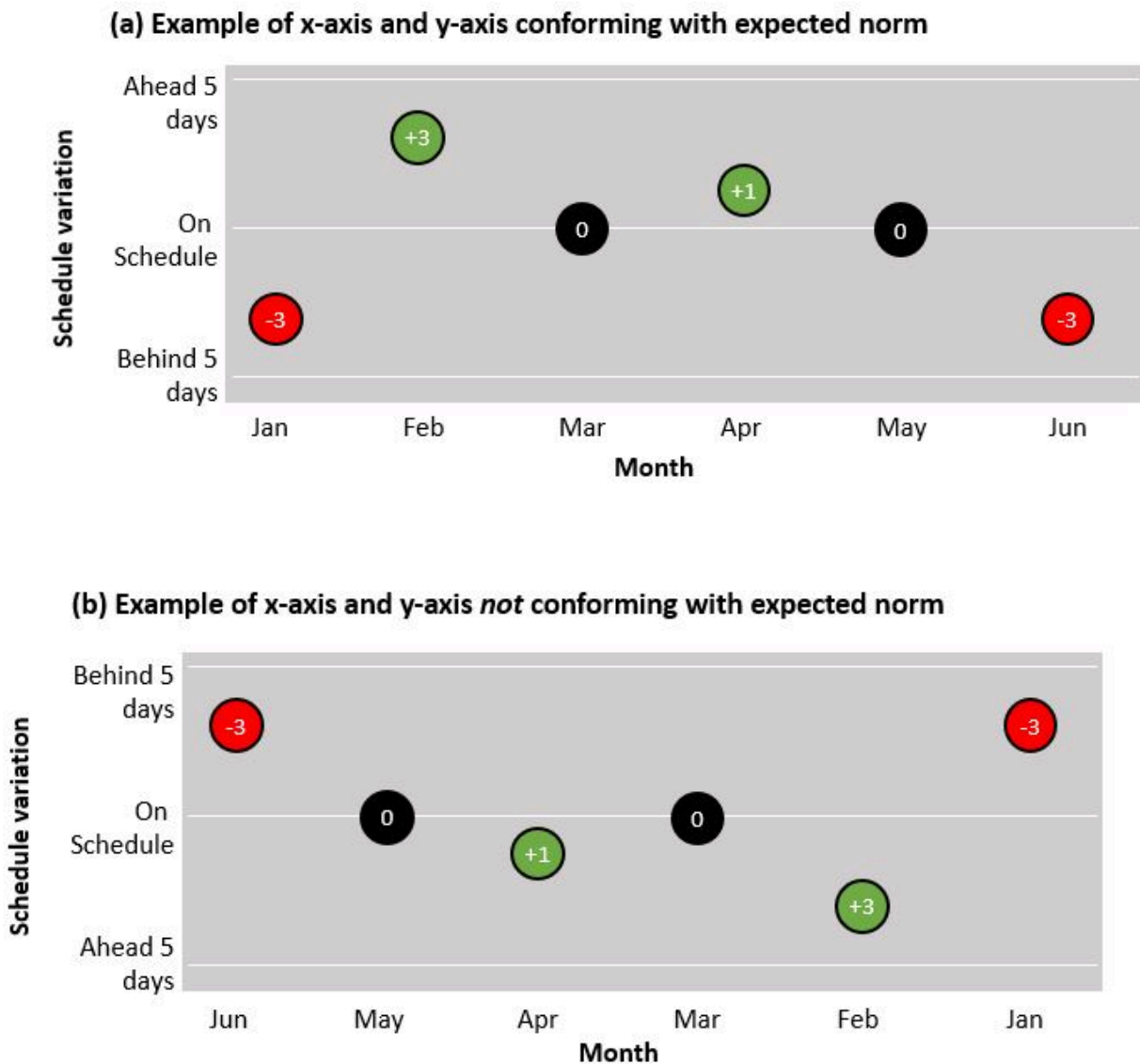


Figure 5.3: Conforming with norms for time and numeric values

5.2 Colour

Colour can be used to highlight difference or similarities, or create emphasis and draw attention (Adams et al., 2012; Phillips & Phillips, 2014). This chapter will discuss some basic elements of colour theory. Colour choice is one of the most important decisions when crafting visuals. Some readers may already be familiar with the colour wheel and concepts such as primary and secondary, or analogous colours. Knowledge of these concepts can be useful in selecting a palette that is visually appealing (Phillips & Phillips, 2014). **Chapter 4** introduces some tools that can assist you with selecting a professional colour palette that observes the principles associated with the colour wheel. As a guiding principle, for corporate visuals, select palettes that are not too garish and ideally align with the organisation's style/communication guide. Using a harmonious, professional palette increases a visual's perceived authority and legitimacy.

It's easy to assume that stakeholders will be viewing the visual 'in colour'. If it's likely the visual will be printed in black and white this should be considered from the very start of the design process. Greys (refer to **Figure 5.4 (a)**) can be used to create meaning within the limitations of a black and white palette, although you will likely need a legend to assist with interpretation. Variations in colour intensity – sometimes achieved through the transparency setting in an application – can also be used with colour palettes (refer to **Figure 5.4 (b)**). If the visual uses multiple intensities of the same or similar colours, it is important to continually check the visual in the medium – for example, on paper if it will be printed – to confirm the colours are showing as intended and with sufficient differentiation (Poulin, 2011). Effective design of visuals also needs to take into account stakeholders who may be colourblind (Lawson, 2015). In such cases meaning conveyed by colours can be communicated in a secondary manner – for example, through shapes or icons (refer to **Figure 5.6**).

(a) Example of variations in black and white colour palette



(b) Example of variations in colour palette

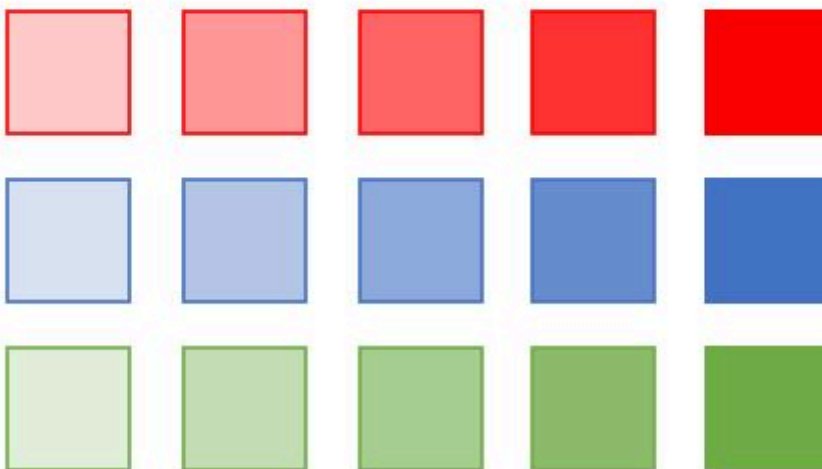


Figure 5.4: Variation in colour intensity

Given that many project stakeholders will have a corporate frame of reference, there can be significant benefit in using 'traffic light' colours for project visuals. It's broadly understood that red in corporate dashboard-style reports implies negativity – a problem or complication or some other undesirable situation. Orange is better than red but is still of concern, signaling a potential problem, whereas green is commonly interpreted as going well or being on track. It is also possible to use the intensity concept to

increase the granularity of the traffic lights – i.e. darker versus lighter green to differentiate between more or less positive. This ‘traffic light’ norm can be used to advantage, but equally if these colours are used to mean something different it is important to ensure stakeholders are cognisant of how the colours should be interpreted, to avoid the stakeholder using a previous frame of reference to interpret their meaning.

5.3 Iconography, shapes and scale

Icons and shapes are visual elements that can also be used to create meaning. Icons can be classified as verbal, pictorial or abstract (Griffin & Takakuwa, 1995). Verbal icons use alpha or numeric symbols known to a specific population – for example, a currency sign for dollars or pounds. Pictorial icons are representational, meaning they should be similar to the thing they represent – for example, an icon of a plane landing to indicate an airport. Abstract icons can be representational but the scope for interpretation can be significantly broader – for example, the icons we associate with public bathrooms. For abstract and verbal icons, it’s important to be aware of stakeholders’ frames of reference. If the visual is conveying process information and the stakeholders are a team of programmers or analysts who understand business processing modelling notation (BPMN), using the symbols associated with this notation will be effective – even though they’re abstract icons they’re understood by the stakeholders using the visual. Similarly, those who have worked extensively with project schedules may associate the diamond shape as being representative of a milestone.

Basic shapes such as circles, squares and triangles can be used as abstract icons where there are no established icons that would be understood by stakeholders. Contemporary software allows the manipulation of these basic shapes to preserve the standard sharp angles or to soften their style. It’s common that stakeholders associate soft, curvilinear shapes as inferring less certainty than sharp, angular shapes (Poulin, 2011). This common interpretation can be used in design to enhance the messaging or ‘tone’ of the visual. This inference is further explained in **Concept Exploration 5.1**.



5.1 Concept exploration: Bouba and Kiki

There are a number of studies that have explored how people associate abstract shapes – one rounded and the other spikey – with ‘non-words’. Across many studies it’s been found that when asked to assign the terms ‘Bouba’ and ‘Kiki’ to the shapes below, the majority of participants associate the shape on the left with the word ‘Kiki’ and the shape of the right with

'Bouba' (Cuskley et al., 2017). This experiment is an example of how we make inferences regarding the meaning/interpretation of shapes based on their geometric features.

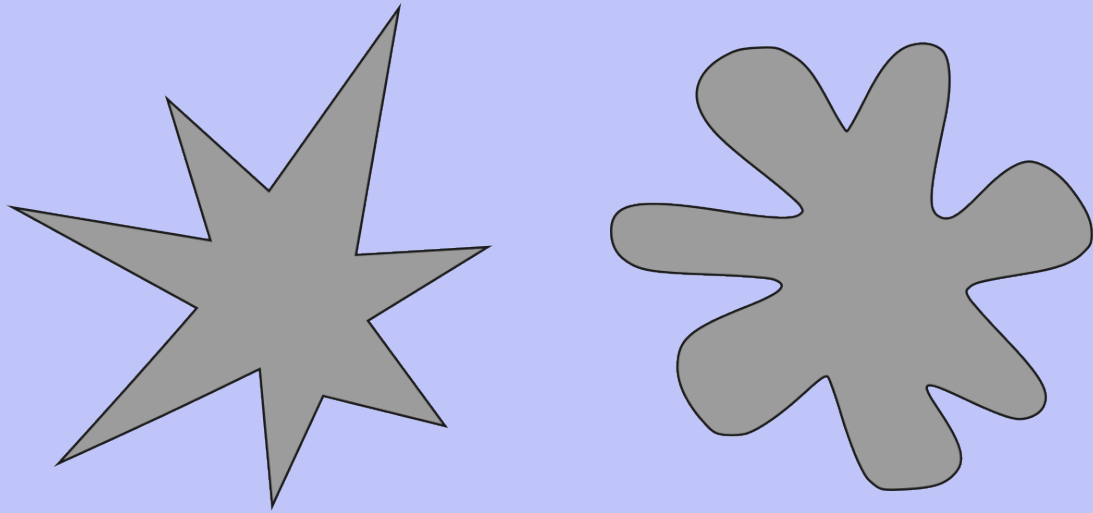


Figure 5.5: Bouba and Kiki

The scale or size of elements on a visual also creates meaning. Larger elements, whether text, shapes or icons, will likely receive increased attention and be perceived to have greater importance or significance than smaller elements. Scale is relative within a visual (Phillips & Phillips, 2014). Consider **Figure 5.6**, which shows the comparative cost of projects within a portfolio by using circles of varying sizes to indicate project cost. Be mindful of legibility when scaling elements. Particularly when a visual is conveying a significant amount of information there can be a tendency to shrink the size of text, icons and shapes, but this can compromise the readability – and therefore usefulness – of the visual.

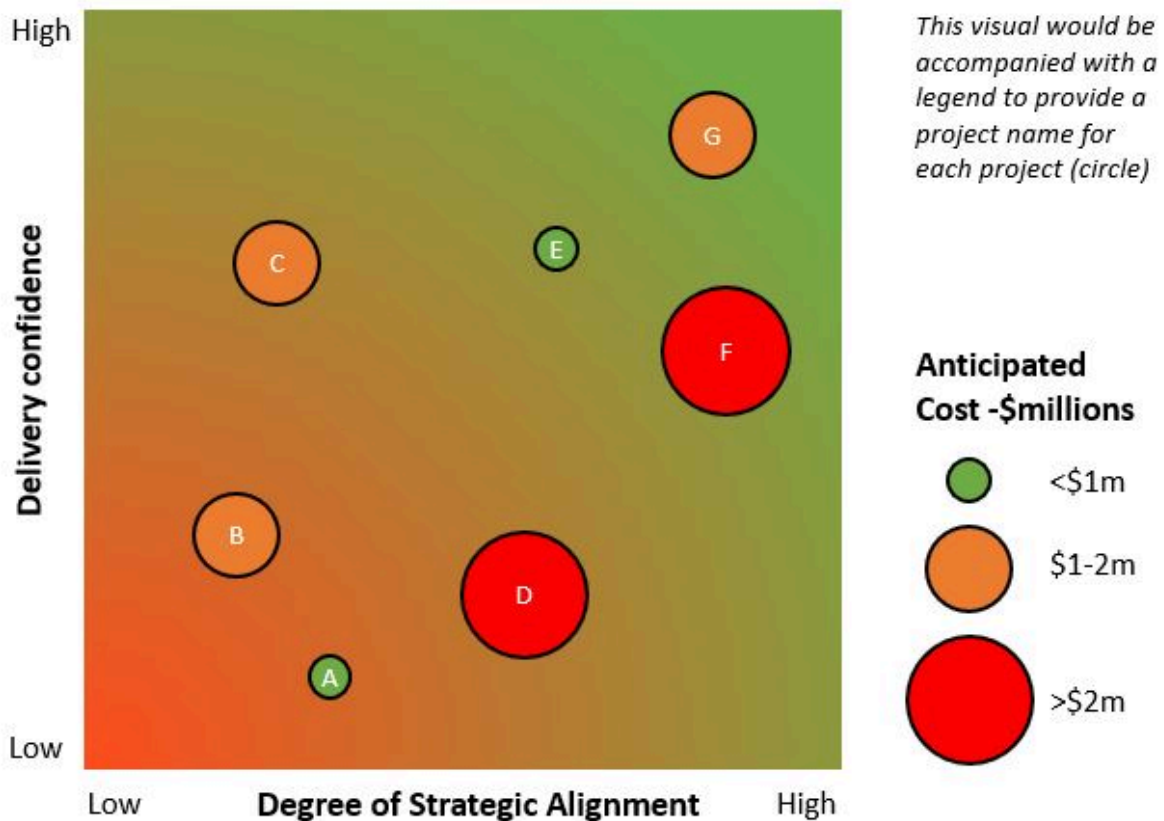


Figure 5.6: Scaling shapes to create meaning

The simple portfolio map (**Figure 5.6**) above uses circles of various sizes to indicate anticipated cost of each project. A larger circle indicates a greater cost, a smaller circle a lesser cost. Traffic light colours are also used to differentiate between projects of greater cost (red), moderate cost (orange) and lesser cost (green).

5.4 Text and typography

The visuals you create for project work will still incorporate text. The term typography describes the use of text in design. It's concerned with font types, size and arrangement. Preserving legibility at all costs is critical when using text. Choose fonts that are easily readable, are of a professional style and do not distract from the message. Ensure the font size is large enough to read – less than 10pt is likely to draw criticism, while less than 8pt is no longer legible (Adams et al., 2012). A visual will not normally benefit from the use of more than two or three different types of fonts. For example, a font for decorative/title elements, a font for headings and then a font for content. Where emphasis is required for a string of text, choose bolding, italicisation or a different colour, rather than capitals or underlining (Adams et al., 2012). Use text effects such as shadows sparingly as they can unnecessarily complicate the visual without assisting in

the creation of meaning (Adams et al., 2012). If the organisation has a style/communication guide which includes recommended fonts these may be an appropriate choice for the visual.



Concept exploration 5.2: Font resources

There are a number of freely available tools and resources on the internet that can assist you in matching fonts. For example, this blog post by Canva discusses font pairing for headings and body text. Visme has published a similar post designed to help you build your skills in pairing fonts. Fontjoy is an interactive tool that enables you to experiment with different pairs of fonts. Take a look at these sites and bookmark them in your internet browser for future reference.



Select a font palette of two or three font choices for the visual at the commencement of the design process. This will avoid unnecessary rework as a decision to change the font later in the design process – even if the size of the font remains the same – can affect the space the text occupies and adversely impact what has been designed. Try to maintain consistent paragraph alignment for similar text elements (Adams et al., 2012). For example, if your visual contains three small paragraphs of text, justify all of them rather than mixing alignment types. Wherever possible avoid hyphens and conform to the contemporary norm of a single (not double) space after a full stop (Adams et al., 2012).

5.5 Common charts and graphs

The archetypes provided in **Part C** are full-page examples of visuals for conveying different types of information relevant to project work. Many of these archetypes include miniature versions of common graphs and charts. **Table 5.1** suggests common charts and graphs that can be useful for presenting types of data. When creating these ‘mini-graphics’ the suggestions regarding colour, scale etc. still apply.

In **Table 5.1** below, you can click on the blue buttons next to the name of the chart or graph to see a stylised example.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=31#h5p-4>

Table 5.1: Common charts and graphs

5.6 A word of caution...

While arguably more universal than written and verbal language, visual language is not contextless. Our interpretation of visuals will be influenced by our professional or discipline backgrounds, our nationalities or cultures, and our previous experiences with visuals – we interpret visuals within our existing frames of reference, which vary from person to person (Avgerinou & Pettersson, 2011; Griffin & Takakuwa, 1995). The discussion of visual elements above is based on the assumption that the stakeholder comes from a Western culture and has participated in corporate life. When working with stakeholders outside this context it’s important to consider and account for differences in understanding. Iconography and colour are good examples of this. Studies reveal that where iconography is abstract – rather than literally representative of what the icons mean – it is culturally dependent (Griffin & Takakuwa, 1995). Similarly, there can be significant differences in the interpretation of colour dependent on culture (Adams et al., 2012; Jonauskaitė et al., 2019; Ou et al., 2004). See **Table 5.2** for the diverse associations of the colour red depending on culture.

Association	USA	Germanic	France	Denmark	Poland	China	Nigeria
Anger	✓	✓			✓		
Danger	✓						
Defiance	✓						
Envy	✓				✓		
Excitement	✓						
Fear	✓	✓			✓		
For Brides						✓	
Happiness						✓	
Hostile	✓						
Jealousy	✓				✓		
Love	✓					✓	
Lucky						✓	
Lust	✓						
Masculinity			✓				
Negative							✓
Positive				✓		✓	
Strength	✓						
Unlucky		✓					✓

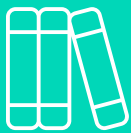
Table 5.2: Cross-cultural differences in the interpretation of red

Table 5.2 has been adapted from Aslam (2006) and reveals that the colour red is associated with different interpretations depending on culture. The square and circle annotations highlight that in some cases the interpretations of reds can be considered opposites. For example, red is a masculine in France versus a bridal colour in China (square annotations). In China red is a lucky colour but in Germanic countries and Nigeria it is considered unlucky (circular annotation).



Chapter 5 summary

- Visual elements such as icons, layout and colour are a visual vocabulary that can be used to create meaning
- Visual language, while more universal than written and verbal language, is interpreted from a stakeholder's frame of reference – e.g. culture, discipline/professional knowledge, previous use of visuals
- Design choices should support readability and the efficient interpretation of meaning – avoid trying to convey too much information in a single visual, using small font sizes and icons, and unnecessary decorative elements
- Less is more – particularly in terms of colour and font types
- Be mindful of common norms such as time flowing from left to right, and size inferring relative importance



Recommended readings

Graphic design basics

- Adams, S., Dawson, P., Foster, J., & Seddon, T. (2012). *Thou shall not use Comic Sans: 365 graphic design commandments*. University of NSW Press.

Cross-cultural considerations

- Griffin, R. E., & Takakuwa, Y. (1995). *Using symbols in international business presentations: How well are they understood?* International Visual Literacy Association. <https://eric.ed.gov/?id=ED380079>

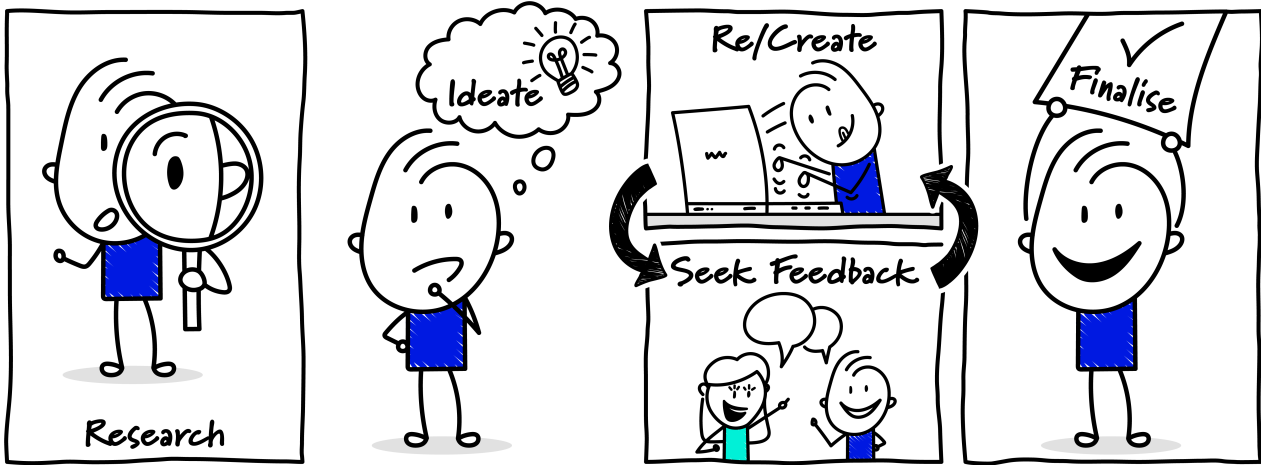
Media attributions

Figure 5.5 Monochrome bouba and kiki by Andrew Dunn used under a CC BY-SA licence.

Table 5.2 are from the Noun Project, and licensed under a Creative Commons Attribution licence.

Cartoon: designed by Samara Hoffmann licensed under a CC-BY-NC-SA licence.

6. THE DESIGN PROCESS



This chapter steps you through the process of designing visuals. A blank page can be intimidating, but coupling the suggestions in this chapter with the visual language elements in **Chapter 5** will give you a starting point for developing effective visuals to help you engage and influence your stakeholders. Whether you want to mobilise your project team to progress a key deliverable, seek a decision from the project board or report to a risk committee on an emerging threat, the process below provides a framework for developing an effective visual.

6.1 The design process

Designing visuals is a type of problem solving. The process involves analysing and understanding your data, and planning and organising this in a manner which supports stakeholder understanding (Collins et al., 2015; Poulin, 2011). The problem at hand is to reconcile multiple elements (illustrated in **Figure 6.1**) to effectively present your story, build understanding, and likely trigger some form of decision or action. The process used to create visuals varies, but a common approach is shown in **Figure 6.2**. The key elements of this process are elaborated upon below.

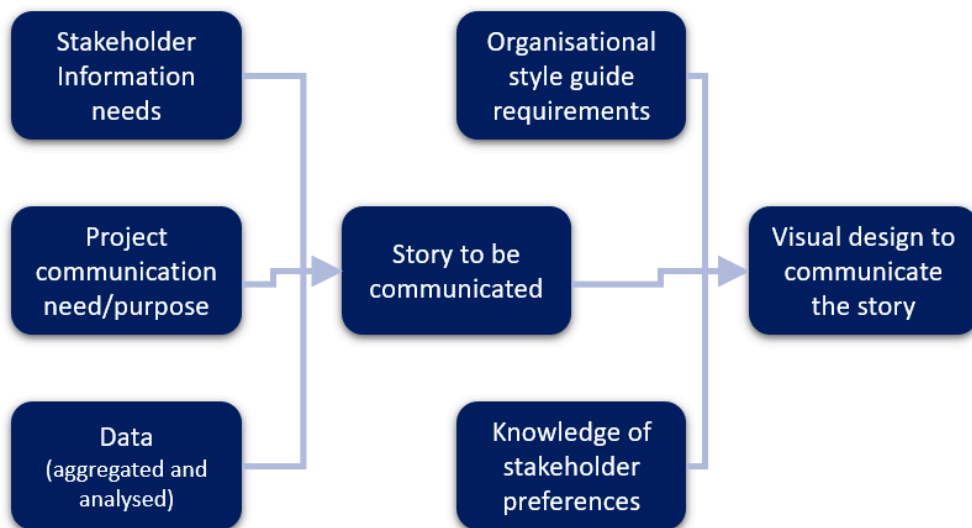


Figure 6.1:
Elements to consider when designing visuals

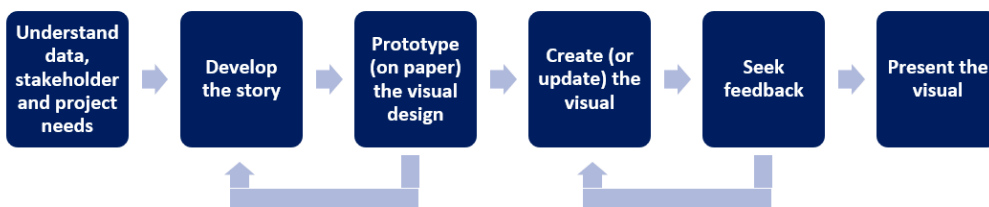


Figure 6.2: The design process for creating project visuals

We communicate to achieve a particular purpose (Adams et al., 2012). Before commencing your visual be clear about this purpose – what is it you want to achieve from the communication (Mizrahi, 2015; Snyder, 2014). Do you need to forewarn a stakeholder about a risk or are you seeking a decision? The purpose will shape the visual’s content and design. At the same time, consider the audience (Mizrahi, 2015). For example, is the stakeholder interested in the topic? Do they have any pre-existing attitudes towards the content? Will they devote considerable time to engaging with the visual? Do they contain expert knowledge already or will you need to provide this detail for the visual to achieve the desired outcome? As discussed in **Chapter 5**, it’s also necessary to consider stakeholders’ ‘frame of reference’ in terms of visual norms. The primary assumption in this book is that the visuals will be supported with some form of explanation/context. However, this may not be the case and will also influence the design choices.

As an example of the need to take the communication’s purpose and the stakeholders into account a visualised timeline used by a project team to manage work on a daily basis will have significantly more detail than a high-level schedule for the project board’s ‘noting’. Similarly, if presenting an options analysis to stakeholders who are technical experts they likely expect different information to a board who have trusted that experts have already been consulted in preparing the options. A project executive working in an organisation with a low-risk appetite may want to review all risks every reporting period, however, a project executive with a higher risk tolerance may only want to review risks that breach organisational tolerances. Developing an awareness of stakeholders’ information needs and preferences can be difficult at first but generally builds with experience (van der Hoorn, 2020).

Collecting accurate and current data is often a challenge in itself. However, it’s almost impossible

to commence designing without it, so ensure you allow enough time before you are required to share the visual to elicit or retrieve the required data and resolve any discrepancies. Ask questions of the data custodians to ensure you understand the data and are aware of any limitations or caveats you may need to add as a note to the visual. It may also be necessary to aggregate or analyse multiple sources of data to understand the situation you're presenting. Together, your understanding of your purpose, the stakeholders and the data will inform how you 'tell the story' visually.

When creating the story, it may be necessary to break it down into more than one visual. A common criticism of visuals is that they try to communicate too much and the potential benefits of using visuals are then compromised. Perhaps the story has three 'chapters' which may require three visuals. It's better to maintain the effectiveness of the visual and create more than one, than to overload your visual with data and diminish its usability.

As with text-based communication, creating a story from data is not a neutral act. There are ethical considerations and obligations – for example, it's crucial to consider how others may be influenced by the way the data is presented. It's not possible to be neutral, but it is possible to disclose the perspective you're adopting in presenting a visual or any underlying assumptions. Even the choice of criteria to assess options (for example in **Archetype 1** in **Part C**) has ethical implications. The inclusion or exclusion of certain criteria could sway stakeholders' perception of the options being presented. Ensuring (as much as possible) that accurate data underpins the visual is the responsibility of the designer. As Edward Tufte so eloquently describes:

'Making an evidence presentation is a moral act as well as an intellectual activity. To maintain standards of quality, relevance and integrity for evidence, consumers of presentations should insist that presenters be held intellectually and ethically responsible for what they show and tell' (Tufte, 2006, p. 9).

When designing visuals, you will also need to consider the organisation's communication style and brand guides. Some organisations will have requirements regarding typography, use of colour, use of corporate logos, even margin sizes. These may be accessed through a communications team or through an intranet or SharePoint site. It's important to familiarise yourself with these before crafting your visual, otherwise, you may end up needing to recreate elements. It can be beneficial to set up visual templates with headers and footers that align with any style or communication requirements. Over time, you may also become aware of implicit preferences of key stakeholders that you choose to incorporate into your visuals.

Once you have your data, know the story you want to convey, and any requirements for organisational style, start to consider the layout of the visual. The archetypes in **Part C** of this book have been designed to provide you with inspiration for presenting different types of data related to project work. However, you can also source inspiration from Google image searches and volumes on graphic design (Adams et al., 2012). As you build your visual practice, take notice of effective visuals that you encounter in daily life (Poulin, 2011). You may take photos and save files for inspiration. While it's beyond the scope of this book to provide detailed advice on copyright laws – which vary between countries – there is a difference between

using others' work for inspiration, and plagiarism. Be mindful of your responsibilities to acknowledge the work of others and avoid copyright infringements.

Chapter 5 provided guidelines for creating effective visuals. There may be times when you deliberately choose to go against these recommendations. If this is the case, do so cautiously and with good reason and make allowances for the implications of having done so. For example, if you choose to use the traffic light colours in a manner contrary to common understanding, ensure you provide a legend and this difference in their use is unmistakably clear. Use of a legend even if you're confirming with expected norms, is good practice, but you can generally be more subtle in their placement! Notes and contextual information can also be used to ensure that readers interpret the visual as intended.

Particularly if you are new to designing visuals, start with pen and paper (or whiteboard) first, before creating the visual in a software package. An A3 sketchpad and pack of felt pens can be a useful tool in addition to the software described in **Chapter 4**. Start by considering the main elements of your visual and how you may lay them out on the page (see **Figure 6.3** for an example). This process will provide a sense of the amount of space (or 'real estate') you can afford to allocate to the various components and may reveal you're trying to communicate too much in a single visual. Try different ideas and particularly in these initial stages be open to starting again. When prototyping, it's common to become aware of an issue which prompts you to further refine the story for clarity. Once you're reasonably confident that the design will be achievable on the page, recreate and populate your visual in your chosen software package.

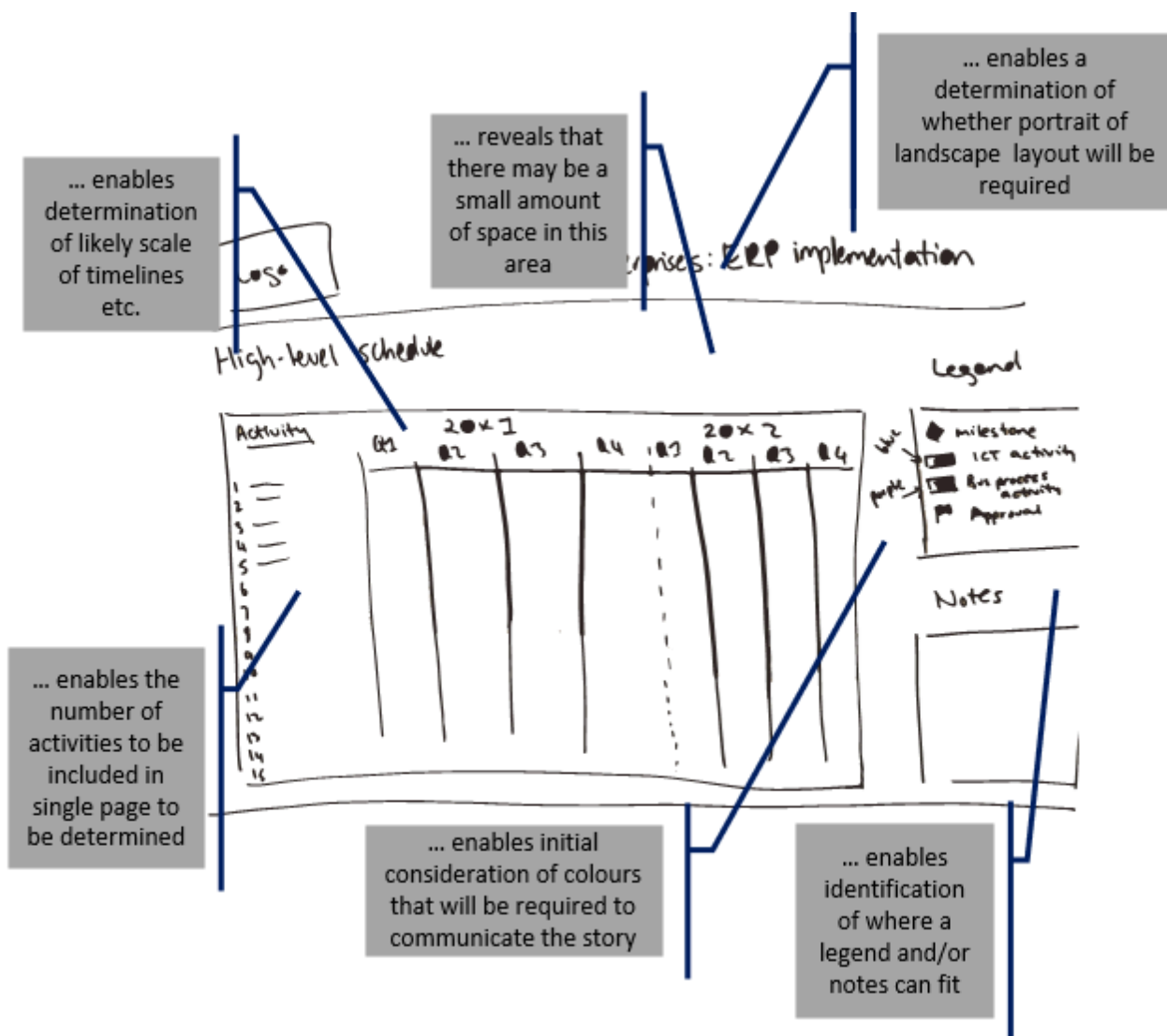


Figure 6.3: An initial prototype for Archetype 4

Creating a prototype on paper or on a whiteboard provides an indication of what can be achieved within the constraints of the size of the page, and also provokes consideration of other elements such as the colour palette and any iconography.

Sometimes a project visual will become an ongoing communication tool, for example, dashboard reports or schedules. Design these visuals with scalability and updatability front of mind. For example, if the graphic includes a risk grid similar to that in **Archetype 3, Example B**, ensure that it's large enough to represent the number of risks you may want to include in any given update, not just what's known at the point of initial design. Visuals are more effective when the style and visual language used are familiar to stakeholders (van der Hoorn, 2020). Wherever possible, avoid changing the design and language of visuals that serve the same purpose without good reason. For example, don't use a different style of dashboard each month. If you find many initiatives within your organisation are using the same visual and the data is already being captured in a central database, it might be beneficial to request a custom report for generating the data from the available datasets.

As you start developing the visual in the software package, seek regular feedback from peers and if

possible, the intended audience. Particularly, when you're first starting out, check understanding of your work by seeking a second or third opinion. Also remember that simpler is often best. Sometimes after sharing a draft with a peer or stakeholder it becomes apparent that certain information is not necessary for the purposes of the story at hand and the visual can be simplified. This review and updating process is an essential step before the formal presentation or sharing of the visual. When presenting visuals to stakeholders, consider their feedback as a way to develop a better understanding of key stakeholder needs which can inform the design of future visuals (see, for example, Killen, 2022 for more information on the importance of understanding stakeholder information needs).

6.2 Visual housekeeping and file conventions

As with any document there are 'housekeeping' – predominately 'configuration' management – issues to be considered. Similar to a text-based document, headers and footers are a useful inclusion for a visual. In the headers and footers, include the version number of the visual, the page number if the visual has multiple pages, and the date of the version. You may also choose to include the version number in the file name. It is often appropriate to include the project or initiative or company name in the header or footer. If the visual is in draft it can be useful to include this as a watermark – assuming it doesn't obscure the content – or include this in a header or footer to ensure stakeholders appreciate that it isn't the final or approved version.

Visuals can be created and shared in a number of file formats. The software application used to create the visual will determine the 'editable' file format. For example, Microsoft PowerPoint files usually have the extension .ppt, while Adobe Illustrator files will likely have the extension .ai. These editable formats will generally be of a larger size than the file formats that are used for sharing the visual. Common formats for distributing visuals via email, which prevent the recipient easily editing the visual, and do not rely on specialist software include PDFs, JPEGs or PNGs (refer to **Concept exploration 6.1** for more information on file types). Since these files are often smaller (and therefore more suitable for emailing), you'll need to be aware of poor resolution. As the file size is reduced, this can impact readability. If your visual is being professionally printed you may be asked to provide the file in a format such as EPS. If you anticipate this professional printing requirement, consult with the print team before commencing work to ensure that your software package can create the visual in a format – and at a resolution – that meets print quality expectations.



6.1 Concept exploration

Selecting the appropriate file format for sharing your visual contributes to its effectiveness. Key considerations are:

- *File size*: If the file is too large, it may cause issues with sending and opening emails
- *Resolution*: If an image's resolution is poor it can become illegible and appear unprofessional
- *Software required to open the file*: Avoid sending stakeholders files they can't easily open

Appreciating the benefits of PNG versus PDF can help you choose the right file type for distributing your visual in a non-editable format:

- *PNG*: Best used if the recipient needs to insert the image into another image or document because PNGs allow for a transparent background
- *PDF*: Best used if stakeholders are likely to print the visual

For more information on file types and their advantages and disadvantages check-out this blog post by HubSpot.

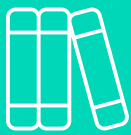


Chapter 6 summary

- Accurate data is essential – ensure you allow time in your planning to elicit and gather data and clarify any discrepancies
- Take the time to find the story in the data that is relevant for your purposes and the needs of your stakeholders – remember your ethical obligations
- Start designing on paper (or a whiteboard) first to determine the overall layout of the visual
- Seek feedback early and regularly to ensure the meaning is clear to your intended

audience

- Use headers and footers to capture information such as version number and status (draft, etc.)
- Select file formats carefully – you'll need to balance quality of resolution (clarity of image) and file size



Recommended readings

The design process

- Collins, W., Haas, A., Jeffrey, K., Martin, A., Medeiros, R., & Tomljanovic, S. (2015). *Graphic design and print production fundamentals*. BCcampus Open Education. <https://open.umn.edu/opentextbooks/textbooks/graphic-design-and-print-production-fundamentals> [Sections 2.1, 2.2, 2.5]. *Note:* This resource is about graphic design generally rather than in the context of internal/stakeholder communications related to projects

Copyright

- Australian Copyright Council
- Creative Commons Licences

Media attributions

6.1 Concept exploration image: Image by evrywheremedia from Pixabay used under CC0 licence.

Cartoon: designed by Samara Hoffmann licensed under a CC-BY-NC-SA licence.

Please note: The quotation in this chapter from Tufte (2006) is reproduced with permission

from the copyright holder. No further reproduction of this quotation is permitted without prior permission from the copyright holder.

PART C: VISUAL ARCHETYPES FOR PROJECT MANAGEMENT

The following chapters provide 12 visual archetypes which can help you influence stakeholders. Consider the archetypes as frameworks for representing particular types of data. To leverage both the visuospatial sketchpad and phonological loop, when sharing one of the archetypes with your stakeholders for the first time you should accompany it with some form of verbal explanation.

Each archetype comes with two examples and then a table outlining the purpose of the archetype and how to tailor the archetype for the content you need to share. Following the table, the archetype examples are provided again with interactive annotations to illustrate the key design choices that have been made when creating the examples. The editable PowerPoint files for each example archetype are provided at the end of each chapter.

The decorative, title and heading elements have deliberately been left plain so you can adapt them to your organisation's style guide or stakeholder preferences. You can change the colours, fonts and iconography to suit your story and your organisational and stakeholder preferences, but make sure the message you need to convey remains central. Also, as discussed in **Chapter 6**, ensure you include appropriate date or version details to support configuration management – normally in the header and footer.

This catalogue of archetypes is certainly not an exhaustive list of visuals used in project management practice. The discipline has diagrams with more specific purposes that have been subject to research and shown to support practice. For example, the Stakeholder Circle can be used to profile stakeholders, a burn down chart to track completion of user stories in agile environments, the visual project map to support project portfolio decision-making, and the project-space model to report and discuss project status (for more information on these visuals see the **Recommended reading** list below). As introduced in **Chapter 4** some organisations will also be using information systems, such as Power BI or Jira that provide reporting capabilities particularly well-suited to quantitative data. The archetypes in the following chapters were selected because they're diverse in the potential content they can communicate and include ideas for presenting more qualitative information that tends to be communicated in text-based formats. They're designed to empower you to develop your own visual practice.

- Archetype 1: Comparison between options
- Archetype 2: Comparison over time
- Archetype 3: Variable-based comparison
- Archetype 4: Sequence – timeline of activities
- Archetype 5: Sequence – process timeline
- Archetype 6: Reasons and drivers
- Archetype 7: Anticipated outcomes or benefits

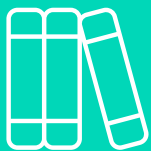
- Archetype 8: Related items
- Archetype 9: Hierarchy of items
- Archetype 10: Comparison of relative values
- Archetype 11: Pictorial – contributions of parts and outcomes
- Archetype 12: Progress tracking

You can preview the archetypes by sliding through the images below.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=33#h5p-33>



Recommended readings

Stakeholder Circle

- Mosaic Project Services. (2006). *Stakeholder Circle tools*. Mosaic Projects. <https://mosaicprojects.com.au/shop-SHC-tools.php>

Visual project map

- Killen, C. (2022). Visualising data for project portfolio decision making. In K. Angliss & P. Harpum (Eds.), *Strategic Portfolio Management*. Routledge.
- Killen, C. P., & Kjaer, C. (2012). Understanding project interdependencies: Exploring the role of visual representation, culture and process. *International Journal of Project Management*, 30(5), 554-566. <https://doi.org/10.1016/j.ijproman.2012.01.018>

Project-space model

- van der Hoorn, B. (2016a). Discussing project status with the project-space model: An action research study. *International Journal of Project Management*, 34(8), 1638-1657. <https://doi.org/10.1016/j.ijproman.2016.09.001>

ARCHETYPE 1: COMPARISON BETWEEN OPTIONS

This archetype is used to communicate the difference between options. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.









Example A: Comparison between options

ABC System Upgrade Project Approach Options Analysis					
Criteria	Option 1:	Option 2:	Option 3:	Option 4:	Option 5:
	<i>'Do Nothing'</i>	Limited scope, managed internally	Limited scope, managed externally	Full scope, managed internally	Full scope, managed externally
Strategic alignment: Support realisation of 2025 Vision	✗	✗	✗	✓	✓
Budget: Within existing operations budget	✓	✓	✓	✓	✗
Approach risk level: Within organisational risk tolerances	Not applicable	✗	✓	✗	✓
Timeframe: Delivered by Dec 2023	✗	✓	✓	✗	✓
Notes/explanation: The ABC System is no longer vendor supported. It is possible to undertake a 'limited scope' upgrade or a 'full scope' upgrade. Either scope would ensure ongoing vendor support but have different costings, risk levels and delivery timeframes.			Legend: ✓ Option meets criteria ✗ Option does not meet criteria		

Example B: Comparison between options

Service Centre Site Options

Three new service centre sites have been identified for management’s consideration. Each site has been assessed as being favourable, neutral or unfavourable against the criteria below.

Criteria	Option 1: Bethania	Option 2: Park Rd	Option 3: Smith Ave
Initial cost to purchase and relocate	\$1.8 million	\$1 million	\$2.4 million
Whole of life cost (per annum)	\$30,000	\$45,000	\$30,000
Timeframe for relocation (option availability)	 July 20X1	 Dec 20X1	 April 20X2
Current fit-out meets requirements	High alignment	Moderate alignment	Moderate alignment
Availability of public transport (within 2km)	 x2	 x1	   x2 x1 x2
Customer perception of site	Neutral	Neutral	Highly desirable

Legend

<ul style="list-style-type: none"> Favourable assessment against criteria Neutral assessment against criteria Poor assessment against criteria 	<ul style="list-style-type: none">  Train available  Ferry available  Tram available  Bus available 	<ul style="list-style-type: none">  # of options available 	<ul style="list-style-type: none">  20X1  20X2 <p style="font-size: small; margin-top: 5px;">White circle: Current date Green circle: Option available</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Guidelines for tailoring the archetype

Archetype	Comparison between options
Purpose	<p>This visual archetype is used to communicate the differences between options. This may include:</p> <ul style="list-style-type: none"> • comparing different delivery or staging approaches for a project • comparing different vendors/solutions for a project • comparing different projects within a program
Information you will need	<ul style="list-style-type: none"> • What are the options? • What are the criterion you are using to compare the options? • The value of the criteria for each option
Tips	<ul style="list-style-type: none"> • Try to compare a small number of options: 2 > 5 is best (up to 7 is possible) • Try to compare a medium number of criteria: 4 > 8 is best (up to 10 is possible)
Page layout	<ul style="list-style-type: none"> • If you have more options than criterion use landscape • If you have more criteria than options, use portrait <p>This figure has a tabular style:</p> <ul style="list-style-type: none"> • column headings are the options • row headings are the criteria • cell contents are the value of the criteria for the option
Text	<p>Cell contents may be text or imagery, if using text:</p> <ul style="list-style-type: none"> • dot points can be useful if you want to note a phrase • when comparing criteria, use the same syntax. For example, ‘Low risk’, ‘Medium risk’, ‘High risk’ across three options rather than ‘20%’, ‘medium risk’ and ‘Risk: high’ • ensure your row and column headings stand out (bold and/or a larger size is better than underlining and capitals)
Imagery	<p>Cell contents may be text or imagery. If using images:</p> <ul style="list-style-type: none"> • use simple icons that have a similar style (line drawings/filled drawings, etc.) • provide a legend at the bottom of the page in case your icon is not clear to the reader, or include a cue word near the icon • ensure they reflect the colour scheme of the remainder of the page
Colour	<p>Consider using a graduated colour scale to highlight more or less favourable assessments of value - for example, you may use dark orange (very poor), light orange (poor), blue (neutral), light green (good), dark green (very good)</p>
Legend	<p>Use a legend for:</p> <ul style="list-style-type: none"> • abbreviations • colour coding • icons
Notes	<ul style="list-style-type: none"> • When comparing more than seven options, consider splitting the diagram across two pages, ensuring headings are repeated on every page • Include page numbers for more than one page

Example A: Comparison between options (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=49#h5p-1>

Example B: Comparison between options (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=49#h5p-5>

'Comparison between options' templates

The templates above are freely available for you to use and adapt. You can download them using the links below:

- Example A: Comparison between options
- Example B: Comparison between options

ARCHETYPE 2: COMPARISON OVER TIME

This archetype is used to communicate the difference in an organisation or situation over time. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.

Example A: Comparison over time

ABC 20XX Product Roadmap

Function group/ function	Jan 20XX	Mar 20XX	May 20XX	Jul 20XX	Sep 20XX
-----------------------------	-------------	-------------	-------------	-------------	-------------

Purchase functionality

Manual transaction management					
Single option credit card facility					
Multiple option credit card facility					

Account management functionality

Cache and cookie functionality					
Parent-child account option					
Predictive discounting functionality					

Reporting functionality

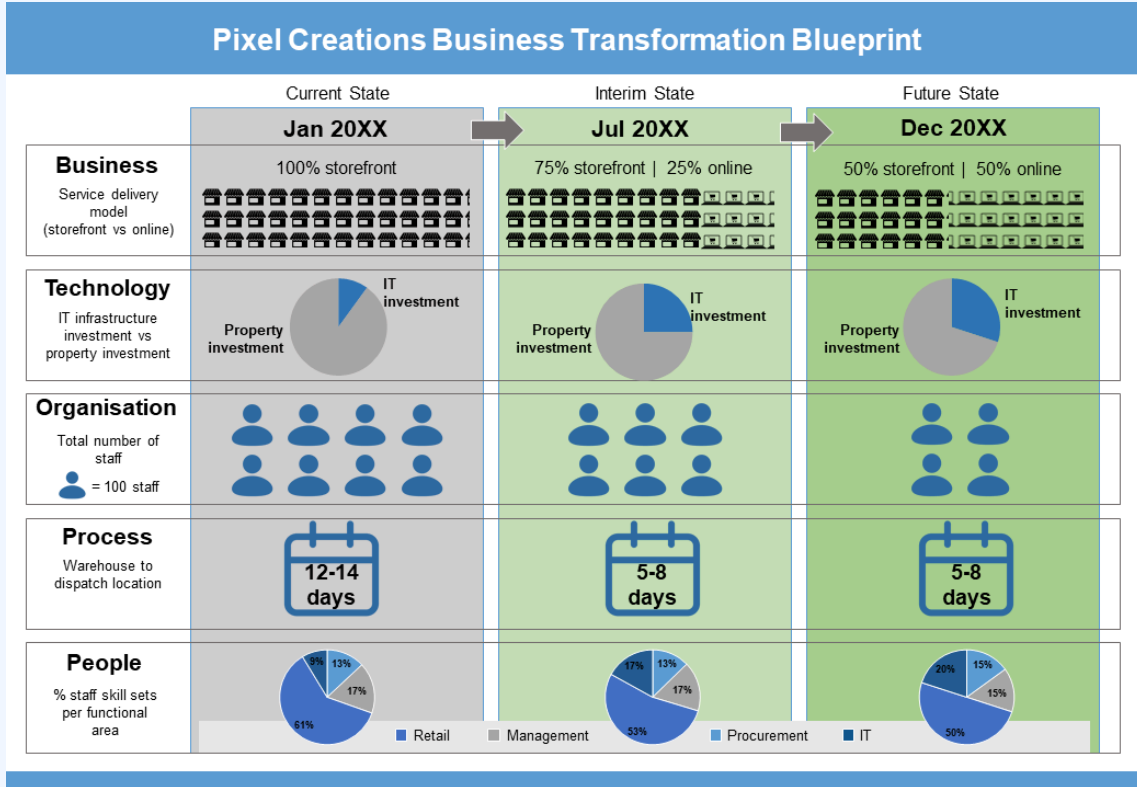
Fixed Excel reporting					
Customisable SQL reporting (non-export)					
Customisable SQL reporting (with export)					

Legend

- Functionality in beta-testing
- Functionality in production
- Functionality retired

Over 20XX, ABC will be subject to a series of functional enhancements across three key areas. Each enhancement will be subject to a period of beta-testing with our champions network prior to release into full production. Timeframes for development and user testing can be provided on request.

Example B: Comparison over time



Guidelines for tailoring the archetype

Archetype	Comparison over time
Purpose	<p>This visual archetype is used to communicate the difference in an organisation or situation over time. This may include:</p> <ul style="list-style-type: none"> • comparing the ‘as is’ or current state to the ‘to be’ or future state of an organisation or situation • comparing the current state, interim states (e.g. end of project stages) and the future state of an organisation or situation
Information you will need	<ul style="list-style-type: none"> • What are the time periods you want to show (e.g. current state, future state, any interim states)? • What are the facets of the organisation or situation you are using to compare (you may use models such as BTOPP, or McKinsey 7S or some other categories that are meaningful for your purpose)? • The details or description for each facet at each stage
Tips	<ul style="list-style-type: none"> • Try to compare a small number of timeframes: 2 > 5 is best (refer to the section on page layout below) • Try to compare a medium number of facets: 4 > 7 is best
Page layout	<ul style="list-style-type: none"> • Generally, timeframes will be across the page (most readers will associate time with an invisible x-axis) • If you have less than five facets, you will probably be able to use a landscape layout • If you have many more facets than timeframe states, use a portrait layout • Always have the earlier state to the left of the page and later states to the right of the page <p>This figure has a tabular style:</p> <ul style="list-style-type: none"> • column headings are the states or periods of time • row headings are the facet of the organisation being compared • cell contents are the details/descriptions of the facets for each time period
Text	<p>Cell contents may be text or imagery, if using text:</p> <ul style="list-style-type: none"> • dot points can be useful if you want to note a phrase • when comparing criteria, use the same syntax. For example, ‘Low risk’, ‘Medium risk’, ‘High risk’ across three options rather than ‘20%’, ‘medium risk’ and ‘Risk: high’ • ensure your row and column headings stand out (bold and/or a larger size is better than underlining and capitals)
Imagery	<p>Cell contents may be text or imagery. If using images:</p> <ul style="list-style-type: none"> • use simple icons that have a similar style • provide a legend at the bottom of the page in case your icon is not clear to the reader, or include a cue word near the icon • ensure images reflect the colour scheme of the remainder of the page <p>You may also choose to use an arrow between row cells or column headings to highlight the time aspect of the diagram</p>
Colour	<p>If using colour, remember that readers will normally associate green with good and orange/red with bad or poor</p>
Legend	<p>Use a legend for:</p> <ul style="list-style-type: none"> • abbreviations • colour coding • icons
Notes	<ul style="list-style-type: none"> • If you have more than seven facets to compare consider combining two facets into a single row and highlight the most pertinent factor for the combined facets • Remember you are trying to bring to the fore what is changing over time. Depending on your purpose, there may not be value highlighting a facet that does not change over the time period being visualised

Example A: Comparison over time (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=189#h5p-8>

Example B: Comparison over time (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=189#h5p-9>

'Comparison over time' templates

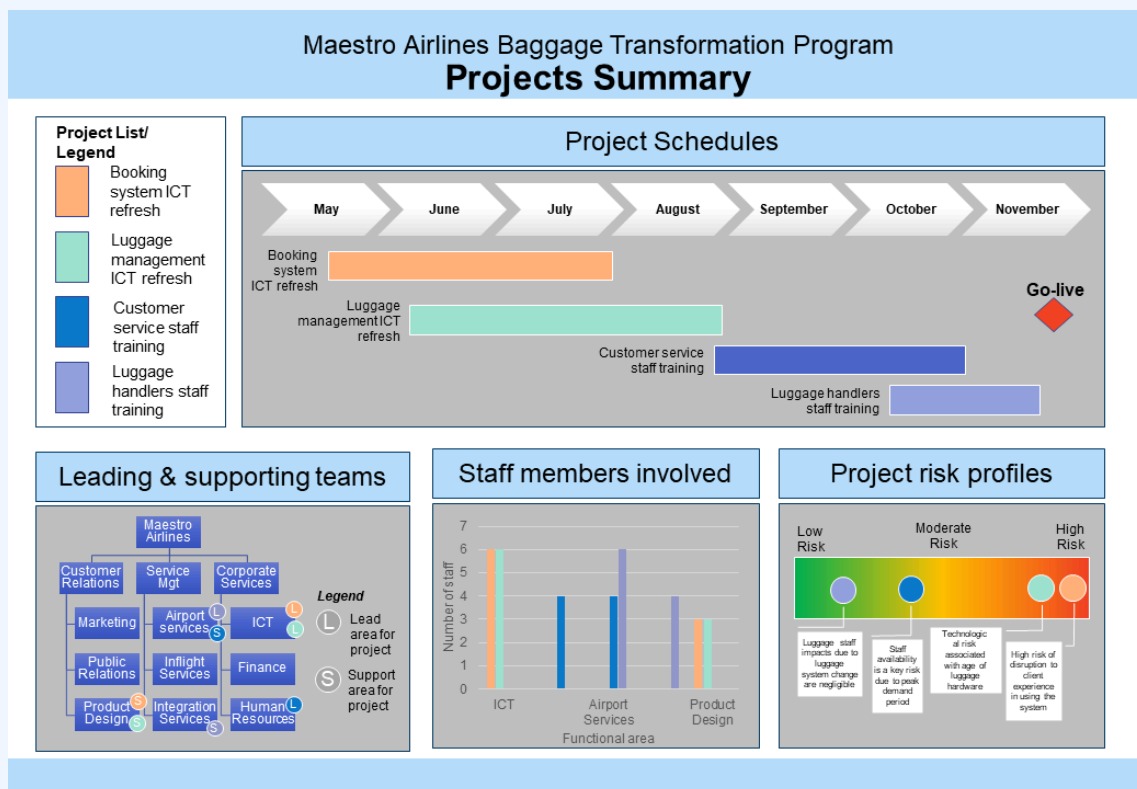
The templates shown above are freely available for you to use and adapt. You can download them using the links below:

- Example A: Comparison over time
- Example B Comparison over time

ARCHETYPE 3: VARIABLE-BASED COMPARISON

This archetype is used to communicate the differences between concepts. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.

Example A: Variable-based comparison



Example B: Variable-based comparison

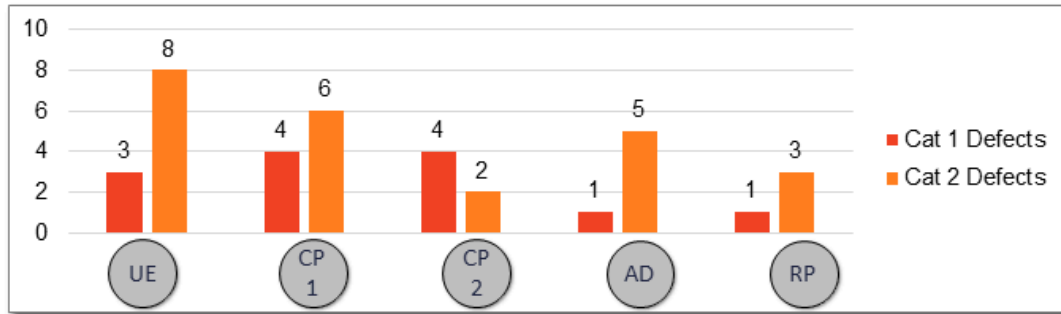
Excel Learning Management System Upgrade

Phase 3 Testing Dashboard

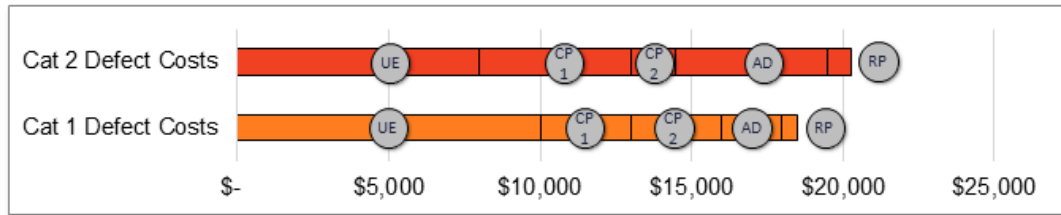
Phase 3: Test Work Packages (Legend)

- User Enrolment Course Package 1 Course Package 2 Administration Reporting
- UE CP 1 CP 2 AD RP

Current Defects by Work Package



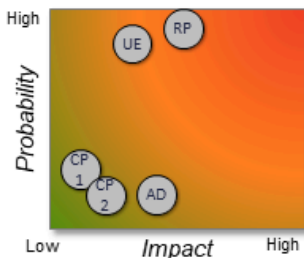
Estimated Cost to Resolve Current Cat 1 and Cat 2 Defects



Planned Completion Versus Forecasted Completion of Test Phase

Week commencing	Monday	Tuesday	Wednesday	Thursday	Friday
01.01.XX			UE (Planned)		[Today]
08.01.XX	CP 1 (Planned), CP 2 (Planned)	UE (Forecasted)	CP 1 (Forecasted)	AD (Planned), CP 2 (Planned)	AD (Forecasted)
15.01.XX	RP (Planned)				RP (Forecasted)

Current Testing Resourcing Risk (by Work Package)



Notes

- User Enrolment testing is well progressed but is not yet completed. This is reflected in the number of defects identified. There is a high likelihood that extra resources will be required to resolve some Cat 1 defects.
- Course Package 1 and 2 are also behind schedule but the team are well-equipped to resolve defects as they arise.
- Administration Testing has only just commenced and multiple defects are already identified. Resourcing risk is considered acceptable for this work package.
- Report testing has not yet commenced, but defects from other work packages will require resolution through this work package. There is a high likelihood that a (currently unassigned) internal resource will need to be seconded to resolve these defects.

Guidelines for tailoring the archetype

Archetype	Variable-based comparison
Purpose	<p>This visual archetype is used to communicate the differences between concepts (e.g. initiatives, work packages). This may include:</p> <ul style="list-style-type: none"> • differences across initiatives • differences in work packages/activities • comparison of work units/areas <p>There are similarities in this archetype to the comparison between options but this archetype is less directed at enabling a decision to be made about an option. It does not highlight that one concept is better than another. It also brings into focus the criterion being compared and maps the options/concepts on these elements.</p>
Information you will need	<ul style="list-style-type: none"> • What are the concepts (e.g. initiatives or work units)? • What are the criterion (variables) you are using to compare? • The value of the criteria (variable) for each concept
Tips	<ul style="list-style-type: none"> • Try to compare a medium number of concepts: 5 > 6 is best (up to 8 is possible) • Try to compare a medium number of criteria/variables 3 > 5 is best
Page layout	<ul style="list-style-type: none"> • Either landscape or portrait is possible • Best choice will depend on the criterion and how you are choosing to visually represent these • Split the page into various sections, one for each criterion – these will be a series of mini-graphics • The size and proportions of each section will depend on the type of graphic you will use for each criterion (e.g. schedule/timeline will require a wide area versus a hierarchy which is more likely to require a square area). Refer to different archetypes for ideas on mini versions to use in your comparison.
Text	<ul style="list-style-type: none"> • For each section ensure you use a heading which indicates the criterion • Text can become small in the mini-graphics so you may limit how many criterion you can show due to font size restrictions • Ensure any axis/labels are provided for each mini-graphic <p>Each section will be for a different criterion/variable. For each section use a different mini-graphic. Mini-graphics may include:</p>
Imagery	<ul style="list-style-type: none"> • mini schedules • mini graphs (pie charts or bar graphs) • hierarchies • spectrums, etc. <p>Keep the mini-graphics as simple as possible.</p>
Colour	<ul style="list-style-type: none"> • Consider using one or two colours for the decorative areas of the page and for the headings for each section • Select a colour or simple icon to represent each concept and use that colour/icon to indicate the concept in each criterion/variable's mini-graphic
Legend	<ul style="list-style-type: none"> • Consider using an overall legend for the page which shows the colour/icon associated with each concept • You may also need to use other mini legends if there are additional icons for individual mini-graphics - where possible, keep these legends as close as possible to the mini-graphic to which they apply
Notes	<ul style="list-style-type: none"> • This visual is a combination of multiple mini-graphics/archetypes • Microsoft SmartArt and Chart functionality can be a useful way to generate mini-graphics • Connect these mini-graphics through the use of a single colour/icon for each concept

Example A: Variable-based comparison (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=205#h5p-10>

Example B: Variable-based comparison (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=205#h5p-11>

'Variable-based comparison' templates

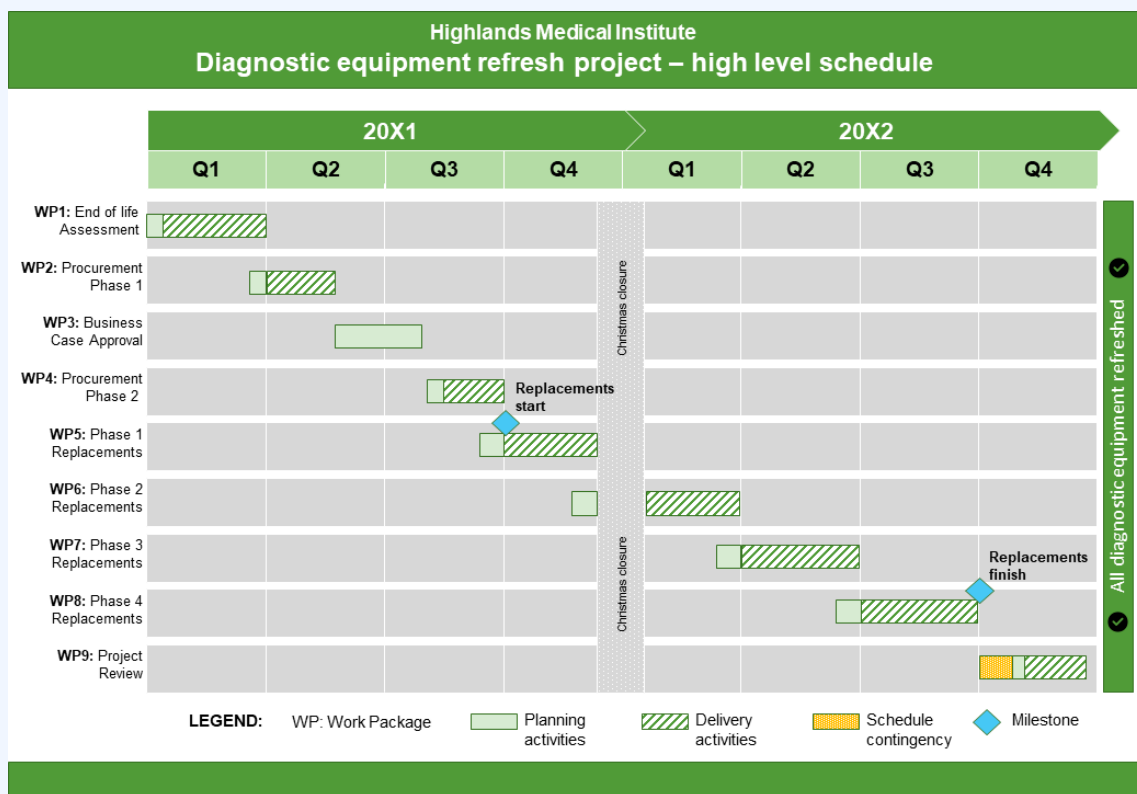
The templates shown above are freely available for you to use and adapt. You can download them using the links below:

- Example A: Variable-based comparison
- Example B: Variable-based comparison

ARCHETYPE 4: SEQUENCE - TIMELINE OF ACTIVITIES

This archetype is used to communicate the order between activities against a linear/calendar timeline. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.

Example A: Sequence – timeline of activities



Example B: Sequence – timeline with activities

Rescue Insurance Agency
20XX Expression of Interest Process: Actuary Services

Stage 1: Preparation and release

Milestone/Activity	12.03	12.03	13.03	14.03	15.03	18.03	19.03	20.03	20.03
Drafting completed	X								
<i>Reviews</i>									
Procurement		X							
Risk Services			X						
Financial Services				X					
COO's Executive Officer					X				
<i>Release Preparation</i>									
Log ICT request	X								
Board notification	X								
Advise PR team of EOI		X							
Test portal				X					
Order newspaper advertisement					X				
<i>Approval and release</i>									
Final updates							X		
Approval by COO								X	
Release to market									X


Approximately one month response period


Stage 2: Evaluation

Week commencing: Milestone/Activity	20.04	27.04	03.05	10.05
Received documents circulated to panel	X			
Panel review period		X		
Panel meeting(s)		X		
Recommendation forwarded to COO for approval			X	
Contract negotiations			X	X
Contract finalisation				X

Planned activity completion timeframe is shown by an 'X' against the relevant day/week

Guidelines for tailoring the archetype

Archetype	Sequence - timeline of activities
Purpose	<p>This visual archetype is used to communicate the order between activities against a linear/ calendar timeline. This may include:</p> <ul style="list-style-type: none"> • the order of tasks within a work package • the order of a group of work packages or activities within a project • the order of projects in a program or portfolio <p>This archetype is similar to a Gantt chart but is designed for readability and is generally a higher level view than a detailed Gantt chart.</p>
Information you will need	<ul style="list-style-type: none"> • What are the tasks/ activities/ projects that you want to show? • What are the start/finish times of each task/ activity/ project? • If there are any subtasks within each task/ activity/ project, when do they start/finish? (Optional) • Any milestones associated with the activities
Tips	<ul style="list-style-type: none"> • Try to compare a moderate or large number of tasks/ activities/ projects: 6 - 12 is best • The overall duration of all tasks/ activities/ projects will determine the accuracy of date representation - for example, if you are showing a four year period, you will probably only be able to divide your timeline into quarters
Page layout	<ul style="list-style-type: none"> • Either landscape or portrait is possible • Best choice will depend on the duration of all activities versus the number of activities to be shown. Use landscape if you have a moderate number of tasks over a longer duration. Use portrait if you have a moderate to large number of tasks over a short duration. • Timeline is always across the top of the page and the tasks/ activities/ projects are rows going down the page • The tasks in their rows will be ordered according to their start date • The tasks/ activities/ projects may be grouped for readability
Text	<ul style="list-style-type: none"> • The timeline will require labels along the top of the page, such as years, quarters, months, weeks or days • Each task/ activity/ project will require a label, likely to be on the left-hand side of the page
Imagery	<ul style="list-style-type: none"> • Represent the duration of each task/ activity/ project with a line or long box in the relevant position on the timeline • Milestones (if used) are commonly represented with a diamond shape • If you are showing sub-tasks in an activity, you may divide up the line or rectangle shape
Colour	<ul style="list-style-type: none"> • Consider using one or two colours for the decorative areas on the page and for the headings • Select a colour or pattern type to indicate various types of tasks within an activity/ project (Optional) • Ensure that any colours/patterns have purpose - there's no benefit to using a different colour for each task/ activity/ project
Legend	<p>Use a legend for:</p> <ul style="list-style-type: none"> • the meaning of any shapes, e.g. rectangles or diamonds • the meaning of any colours/patterns/icons • abbreviations
Notes	<ul style="list-style-type: none"> • If you want to highlight hard dependencies between tasks/ activities/ projects, you can use a line to link the rectangles - make sure you explain this meaning in your legend. • You may choose to add the overall objective or vision at the end of the timeline

Example A: Sequence – timeline with activities (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=236#h5p-12>

Example B: Sequence – timeline with activities (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=236#h5p-13>

'Sequence – timeline with activities' templates

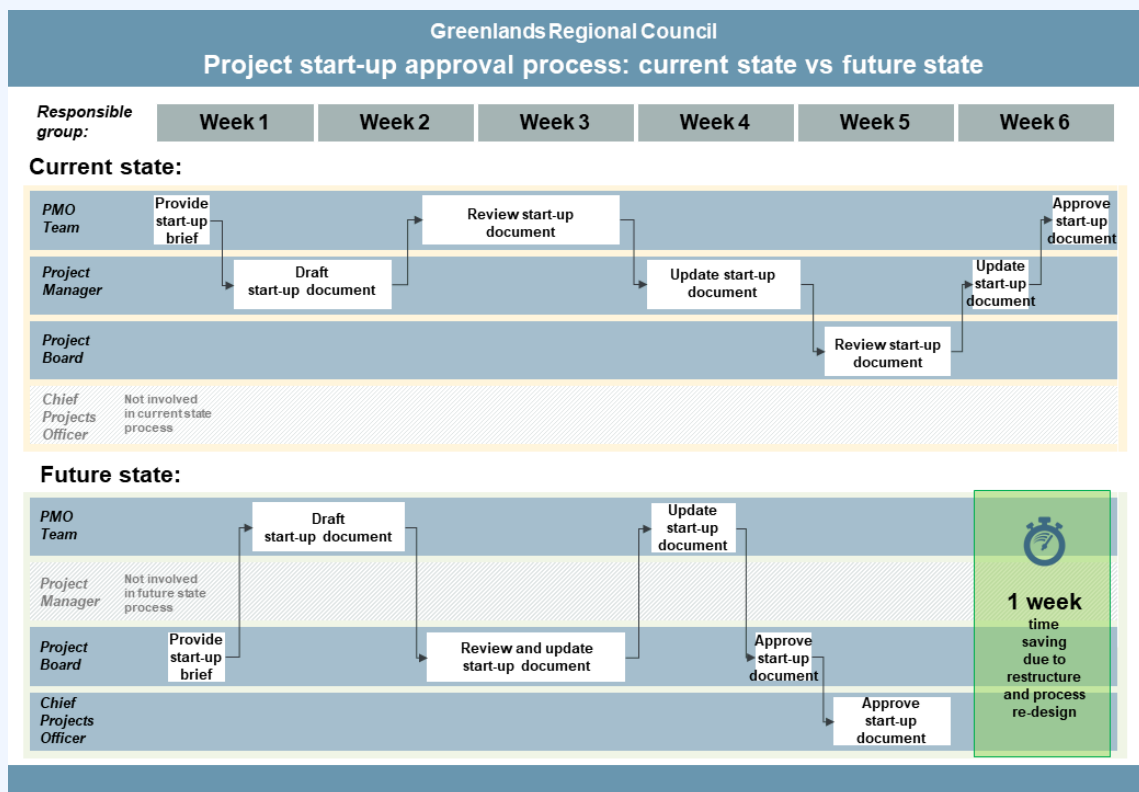
The templates shown above are freely available for you to use and adapt. You can download them using the links below:

- Example A: Sequence – timeline with activities
- Example B: Sequence – timeline with activities

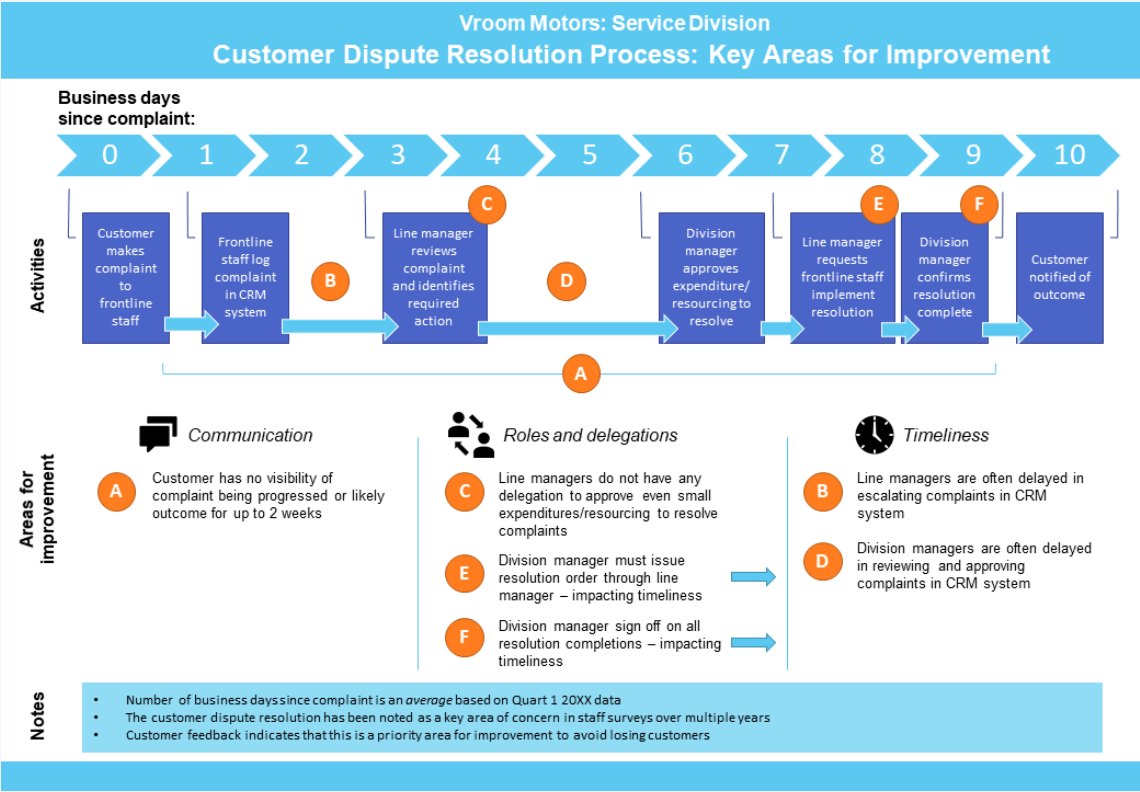
ARCHETYPE 5: SEQUENCE - PROCESS TIMELINE

This archetype is used to communicate the order of tasks in a process against time. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.

Example A: Sequence – process timeline



Example B: Sequence – process timeline



Guidelines for tailoring the archetype

Archetype	Sequence - process timeline
Purpose	<p>This visual archetype is used to communicate the order of tasks in a process against time. This may include:</p> <ul style="list-style-type: none"> • showing a complex process about the project management tasks or technical tasks associated with the project • comparing current state (as is) and future state (to be) processes <p>This archetype is similar to formal process mapping methods (such as business process modelling and notation) but is simpler and more flexible.</p>
Information you will need	<ul style="list-style-type: none"> • What are the activities in the process? • The sequence/order of activities in the process • The duration of each activity (particularly if you want to show relative length of each activity against a timeline) • If you're using rows to highlight who is undertaking each activity, who is responsible for each activity? • Artefacts or documents associated with each activity (if this is important to show)
Tips	<ul style="list-style-type: none"> • Present the level of detail relevant to the stakeholders who will use the diagram • Focus on what you want to highlight in presenting the diagram - for example, is it a shorter process in the future state version or is it different people being involved in the process? (This will impact how you draw the diagram)
Page layout	<ul style="list-style-type: none"> • Landscape is recommended • Timeline is across the top of the page with the process flowing from left to right joined by arrows • Rows going down the page may be used to designate responsibility/people/groups or types of activities (e.g. planning, executing or approval)
Text	<ul style="list-style-type: none"> • The timeline will require labels such as minutes, days or weeks • Each activity in the process will require a label
Imagery	<ul style="list-style-type: none"> • Represent each activity in the process as a box (ideally the width of its duration against the timeline) • Join the boxes with arrows to show the order of the tasks • Tasks should flow from left to right
Colour	<ul style="list-style-type: none"> • Consider using one or two colours for the outlines of the areas on the page and for the timeline • Ensure any colours/patterns have purpose - there's no benefit to using a different colour for each activity
Legend	<p>Use a legend for:</p> <ul style="list-style-type: none"> • the meaning of any colours/patterns (or ensure there is a text label with this information) • any abbreviations
Notes	Nil

Example A: Sequence – process timeline (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=263#h5p-14>

Example B: Sequence – process timeline (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=263#h5p-15>

'Sequence – process timeline' templates

The templates shown above are freely available for you to use and adapt. You can download them using the links below:

- Example A: Sequence – process timeline
- Example B: Sequence – process timeline

Please note: The icons in Example B are sourced from Noun Project and are licensed under a Creative Commons Attribution licence:

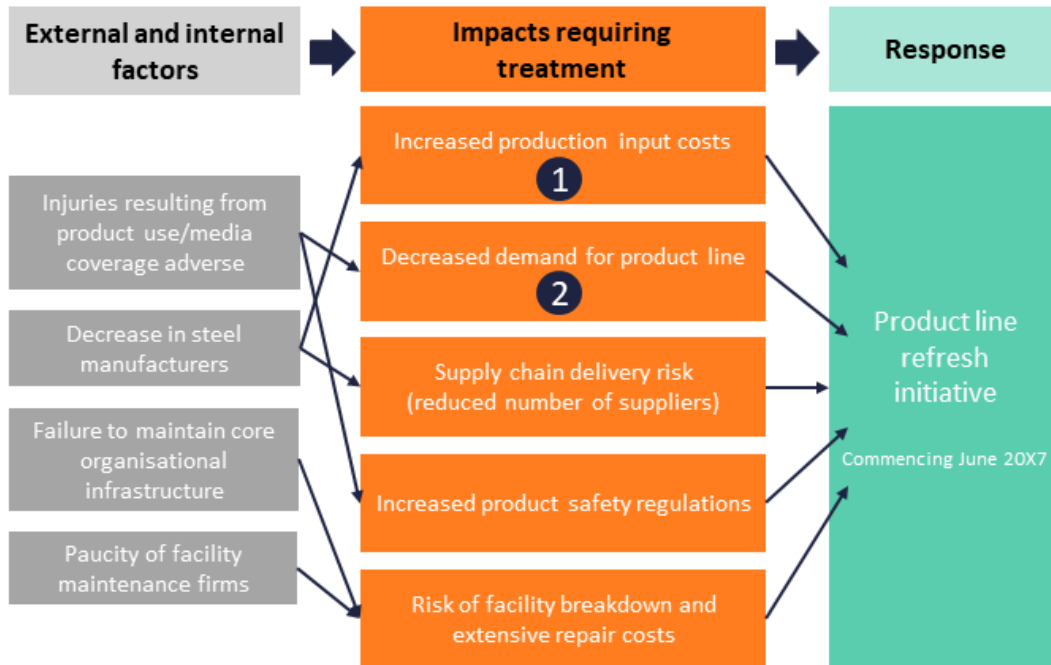
- Speech bubbles: Communication by Agus Raharjo
- People: Communication by ProSymbols
- Clock: Clock by art shop

ARCHETYPE 6: REASONS AND DRIVERS

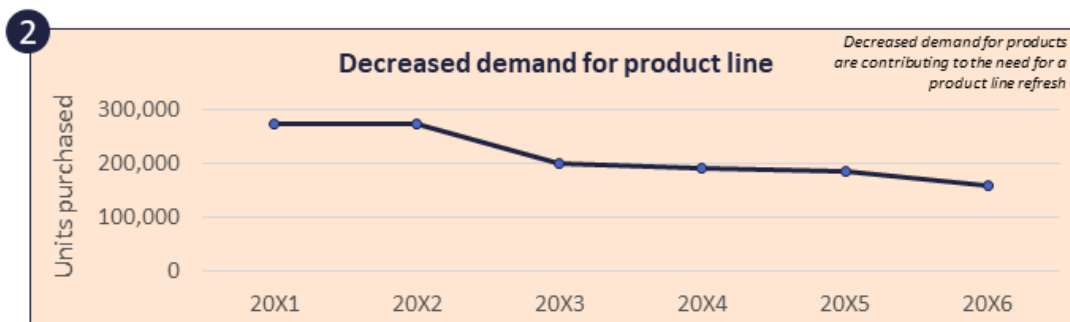
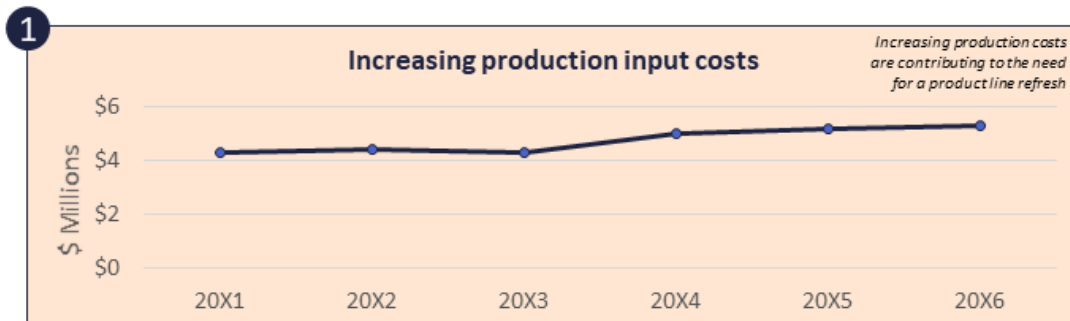
This archetype is used to communicate why something has arisen or is required. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.

Example A: Reasons and drivers

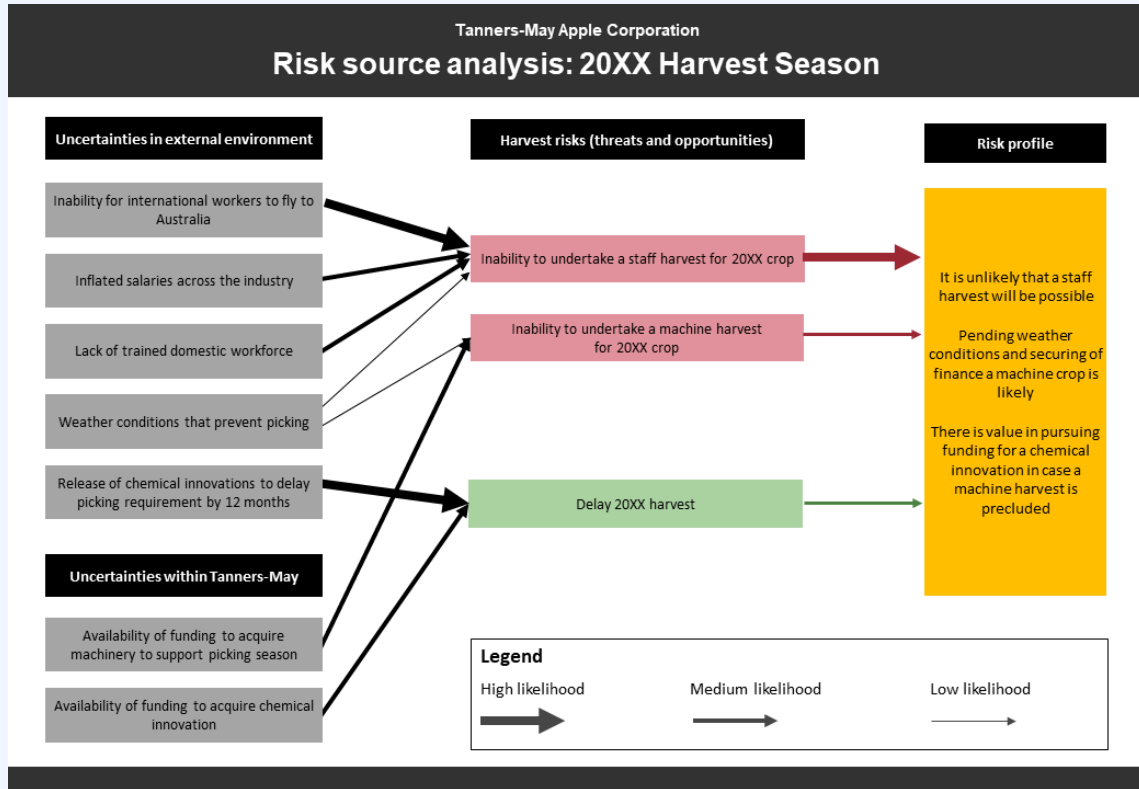
Playful Kids Corporation Drivers for product line refresh



Supporting information related to 'Impacts requiring treatment'



Example B: Reasons and drivers



Guidelines for tailoring the archetype

Archetype	Reasons and drivers
Purpose	<p>This visual archetype is used to communicate why something has arisen or is required. This may include:</p> <ul style="list-style-type: none"> • the drivers or reasons for an initiative being undertaken (why it is necessary) • why a risk or issue has arisen <p>This archetype is similar in visual structure to a benefits dependency map.</p>
Information you will need	<ul style="list-style-type: none"> • The outcome that you want to explain (e.g. the initiative, risk or issue) • The drivers/influences/factors that have caused/are causing the risk/issue or need for the initiative • There may be multiple layers (hierarchy) of drivers/influences/factors that you want to communicate • If you do have multiple layers (hierarchy) you will need to know how they relate/link
Tips	<ul style="list-style-type: none"> • If you are using multiple layers of reasons, consider the sequence in which they occur (inform/influence one another) - these will be your columns. • You may use this visual archetype with other visual archetypes to create a single page visual (i.e. it may be used in combination with other visual archetypes)
Page layout	<ul style="list-style-type: none"> • Either landscape or portrait may be possible depending on the number of drivers/influences/factors and any layers and whether you are coupling this archetype with other archetypes on a single page • Drivers/influences/factors are to the left flowing to the right • The initiative/risk/issue is on the far right
Text	<ul style="list-style-type: none"> • Any layers will require a heading for the group of drivers/influences/factors • Each driver/influence/factor and initiative/risk/issue will require a label
Imagery	<ul style="list-style-type: none"> • Represent each driver/influence/factor and initiative/risk/issue as a rectangle (or other shape) • Vertically align drivers/influences/factors in a layer in a column • Use arrows to indicate the links between layers in your diagram
Colour	<ul style="list-style-type: none"> • Consider using colour to indicate favourable (green) versus unfavourable (red or orange) elements in the drawing - for example, orange/red rectangles for problems that require a solution and a green rectangle for the initiative that provides the solution to the problems
Legend	<ul style="list-style-type: none"> • A legend is not likely to be required for this visual archetype unless abbreviations are being used in the labels
Notes	<ul style="list-style-type: none"> • Consider using another visual archetype or chart to explain drivers/influences/factors in your diagram

Example A: Reasons and drivers (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=285#h5p-16>

Example B: Reasons and drivers (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=285#h5p-17>

'Reasons and drivers' templates

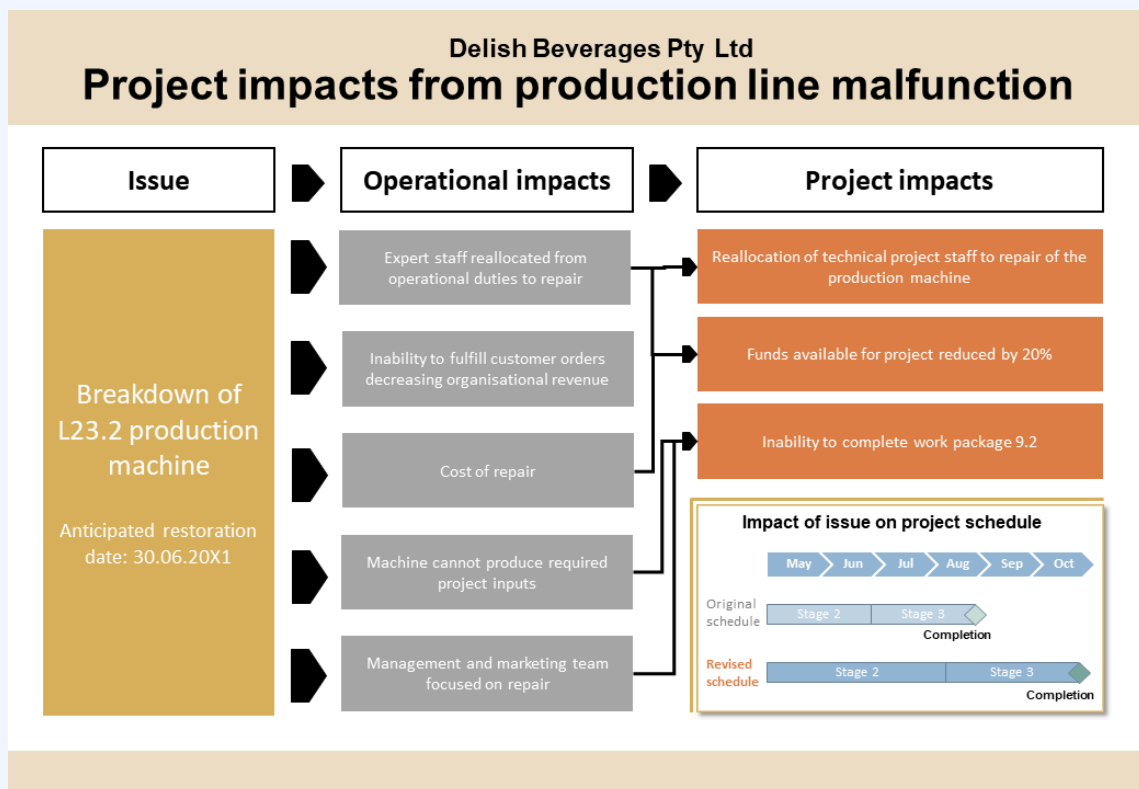
The templates shown above are freely available for you to use and adapt. You can download them using the links below:

- Example A: Reasons and drivers
- Example B: Reasons and drivers

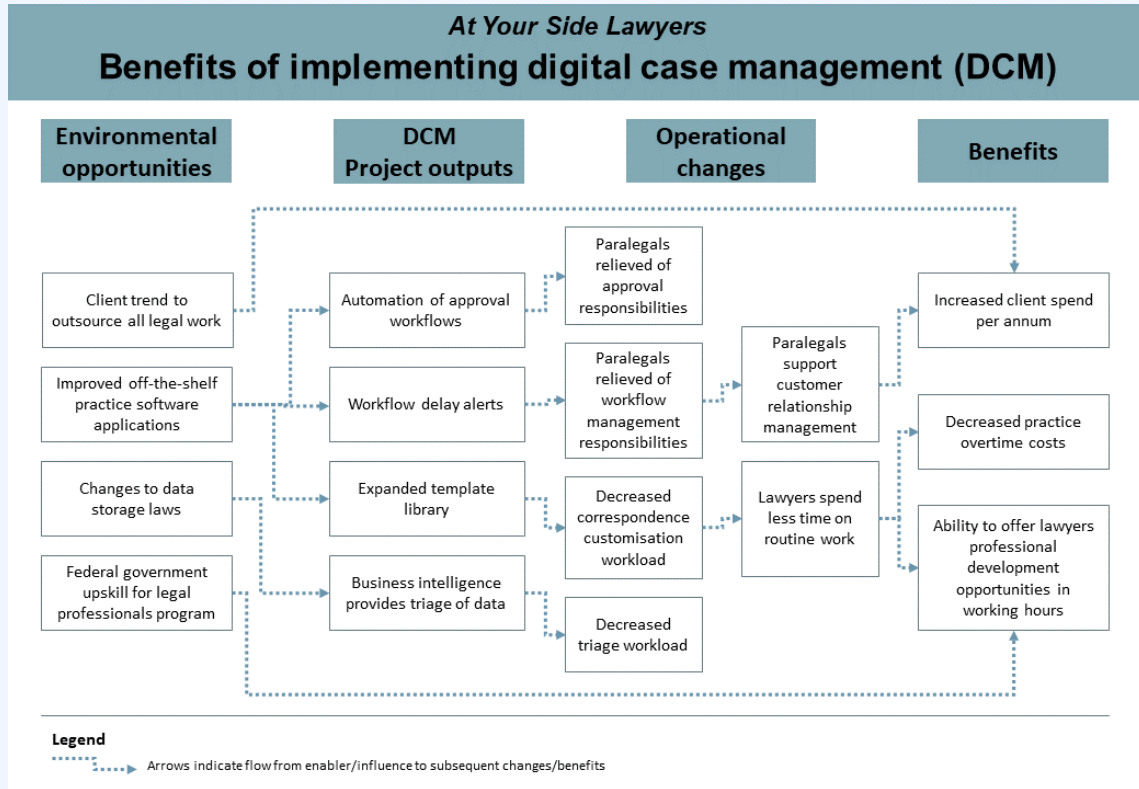
ARCHETYPE 7: ANTICIPATED OUTCOMES OR BENEFITS

This archetype is used to communicate the outcome of something that has happened or may happen. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.

Example A: Anticipated outcomes or benefits



Example B: Anticipated outcomes or benefits



Guidelines for tailoring the archetype

Archetype	Anticipated outcomes or benefits
Purpose	<p>This visual archetype is used to communicate the outcome of something that has happened or may happen. This may include:</p> <ul style="list-style-type: none"> • the deliverables/outcomes/benefits of an initiative • the deliverables/outcomes/benefits of taking a particular course of action • problems that are occurring as a result of an initiative/activity/risk/issue <p>This archetype is based on a benefits dependency map.</p>
Information you will need	<ul style="list-style-type: none"> • The initiative/event that is triggering some outcomes/impacts • The outcomes/impacts that have/are/will occur • There may be multiple layers (hierarchy) of outcomes/impacts that you want to communicate • If you do have multiple layers (hierarchy) you will need to know how they relate/link
Tips	<ul style="list-style-type: none"> • If you are using multiple layers of outcomes/impacts, consider the sequence in which they occur (inform/influence one another) • You may use this visual archetype with other visual archetypes to create a single page visual (i.e. it may be used in combination with other visual archetypes)
Page layout	<ul style="list-style-type: none"> • Either landscape or portrait may be possible depending on the number of drivers/influences/factors and any layers and whether you are coupling this archetype with other archetypes on a single page • The initiative/event is on the far left • Outcomes/impacts are to the right of the initiative/event
Text	<ul style="list-style-type: none"> • Any layers of outcomes/impacts will require a heading for the group of each outcomes/impacts • Each outcome/impact and initiative/event will require a label
Imagery	<ul style="list-style-type: none"> • Represent each outcome/impact and initiative/event as a rectangle (or other shape) • Use arrows to indicate the links between layers in your diagram
Colour	<p>Consider using colour to indicate favourable (green) versus unfavourable (red or orange) elements in the drawing.</p> <p>For example:</p> <ul style="list-style-type: none"> • green rectangles for benefits that might arise from an initiative • red rectangles for adverse impacts that may have arisen from an issue
Legend	<ul style="list-style-type: none"> • A legend is not likely to be required for this visual archetype unless abbreviations are being used in the labels or stakeholders are unfamiliar with this style of diagram
Notes	<ul style="list-style-type: none"> • Consider using another visual archetype/s or chart/s to explain the outcomes/impacts listed in your diagram

Example A: Anticipated outcomes or benefits (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=300#h5p-18>

Example B: Anticipated outcomes or benefits (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=300#h5p-19>

'Anticipated outcomes or benefits' templates

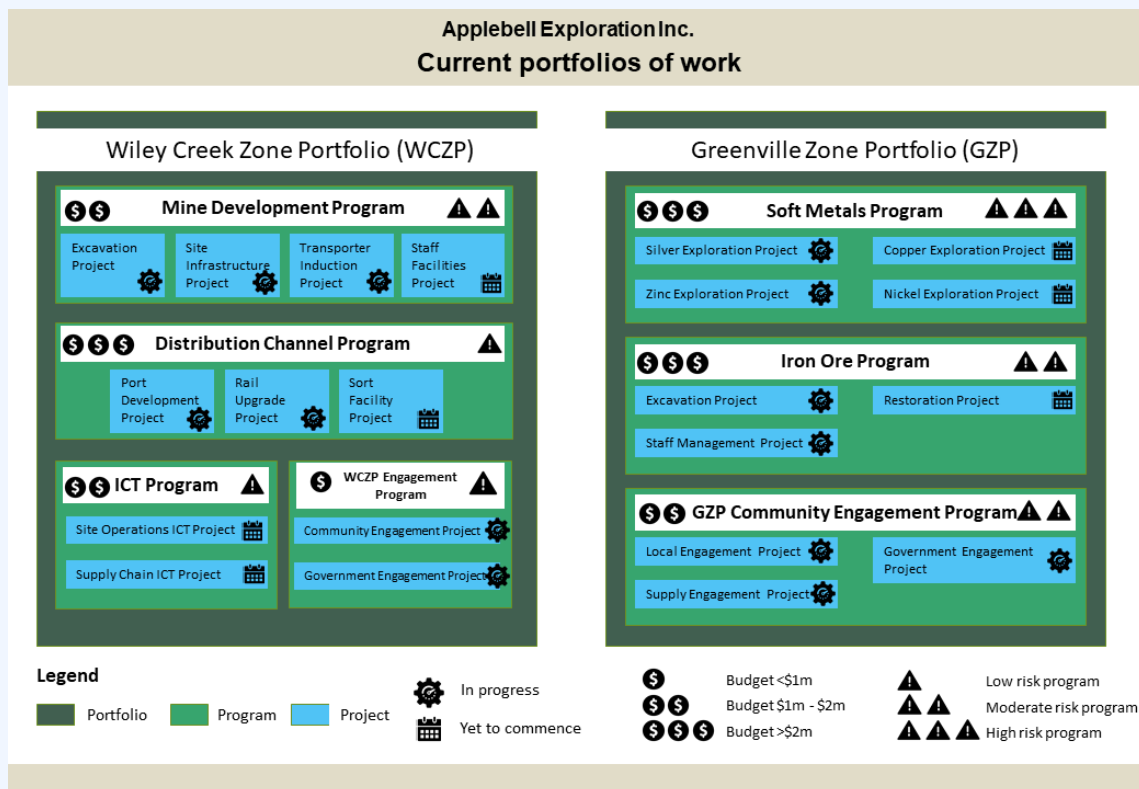
The templates shown above are freely available for you to use and adapt. You can download them using the links below:

- Example A: Anticipated outcomes or benefits
- Example B: Anticipated outcomes or benefits

ARCHETYPE 8: RELATED ITEMS

This archetype is used to communicate the relationship of things within groups. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.

Example A: Related items



Example B: Related items

Silveredge State Government

Risks Associated with Machinery of Government Change

Legend

Risk category	Risk impact	Risk cause	Risk rating High Medium Low	Related risks
---------------	-------------	------------	-----------------------------------------	--------------------------

Risks with customer impacts

Disruption of services	<i>Due to:</i>	<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;">Delays in systems integration or availability of data </div> <div style="border: 1px solid #ccc; padding: 5px;">Insufficient staff training due to work in new roles </div>	
Reduced service lines	<i>Due to:</i>	<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;">Cost of Machinery of Government Change impacting 20XX budgets </div> <div style="border: 1px solid #ccc; padding: 5px;">Cost of Machinery of Government Change impacting resource availability </div>	

Risks with staff impacts

Reduced morale	<i>Due to:</i>	Requirement to work in service areas or roles that are not within their expertise or interest	
Increased stress	<i>Due to:</i>	Machinery of Government change work in addition to business as usual expectations	
		Uncertainty in role consolidation and movement	
		Inability to access required information systems	
Increase in resignations	<i>Due to:</i>	Increased stress and reduced morale	
		Wage growth and low unemployment in private sector	

Guidelines for tailoring the archetype

Archetype	Related items
Purpose	<p>This visual archetype is used to communicate the relationship of things within groups. This may include:</p> <ul style="list-style-type: none"> • projects within programs and portfolios • dependencies • groupings of issues, risks or benefits
Information you will need	<ul style="list-style-type: none"> • The lowest level of items you want to communicate (e.g. a project). • The groups of these lowest level items (there may be multiple groups and a hierarchy of groups)
Tips	<ul style="list-style-type: none"> • You can annotate features/characteristics of the low-level items using icons (use a legend to explain the icons)
Page layout	<ul style="list-style-type: none"> • Either landscape or portrait may be possible depending on the number of low-level items and groups • Low level items will be a shape within a group • Multiple groups may be within a large group
Text	<ul style="list-style-type: none"> • Each low-level item and each group will require a label (e.g. a project name, a program name, a portfolio name, etc.)
Imagery	<ul style="list-style-type: none"> • Low level items will be a shape or icon with text • These low level items are then ‘bounded’ in the shape or outline of the associated group
Colour	<p>Use colour to differentiate the types of items. For example:</p> <ul style="list-style-type: none"> • all of the lowest-level items should be a single colour • the first level of grouping should be another colour • any higher levels of grouping should be another colour
Legend	<p>Use a legend for:</p> <ul style="list-style-type: none"> • explaining the colour used to represent the different groups • any icons/annotations you might use on the diagram to show features about the low level items or groups
Notes	<ul style="list-style-type: none"> • Take care if using different shapes in your diagram - it could look messy <p>For example, use all rectangles or all circles</p>

Example A: Related items (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it

online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=314#h5p-20>

Example B: Related items (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=314#h5p-21>

'Related items' templates

The templates shown above are freely available for you to use and adapt. You can download them using the links below:

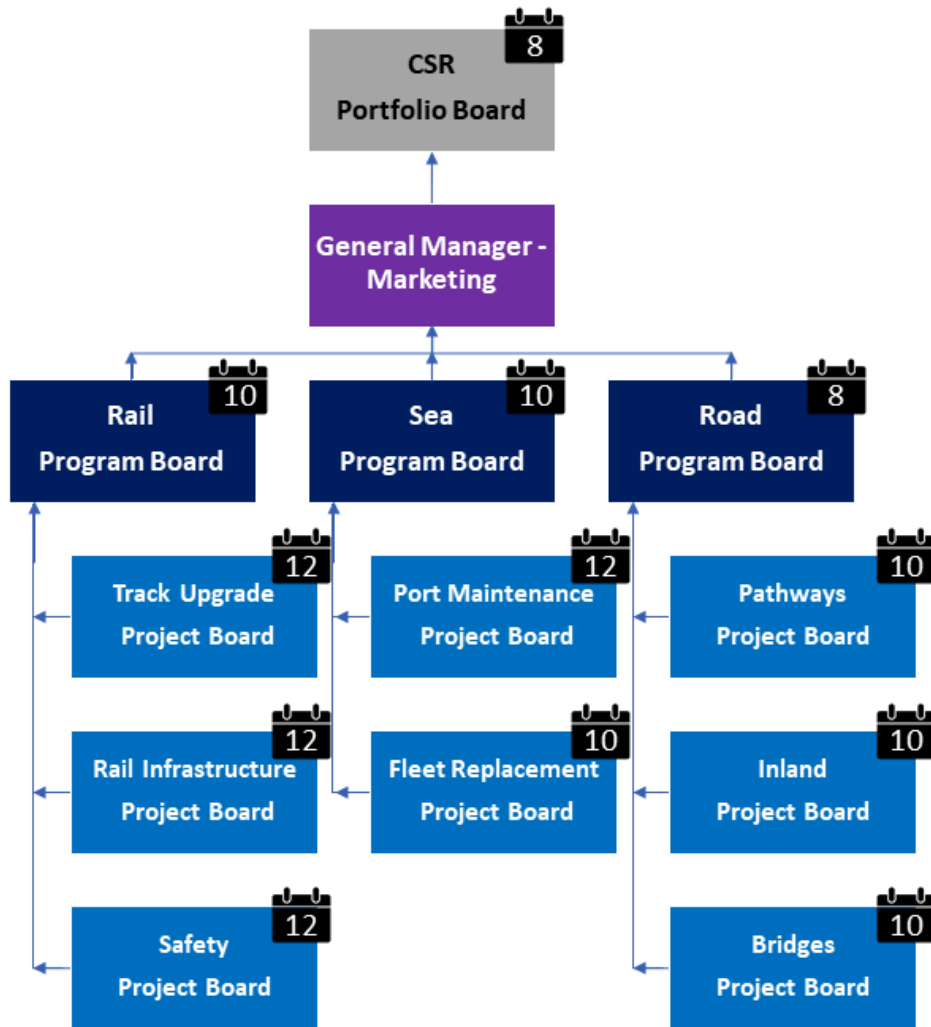
- Example A: Related items
- Example B: Related items

ARCHETYPE 9: HIERARCHY OF ITEMS

This archetype is used to communicate how something is broken down into smaller and smaller parts. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.

Example A: Hierarchy of items

CSR Enterprises Escalation and approval pathways



Legend



Meeting frequency (per year)



+/- 10% Plan tolerances prior to escalation

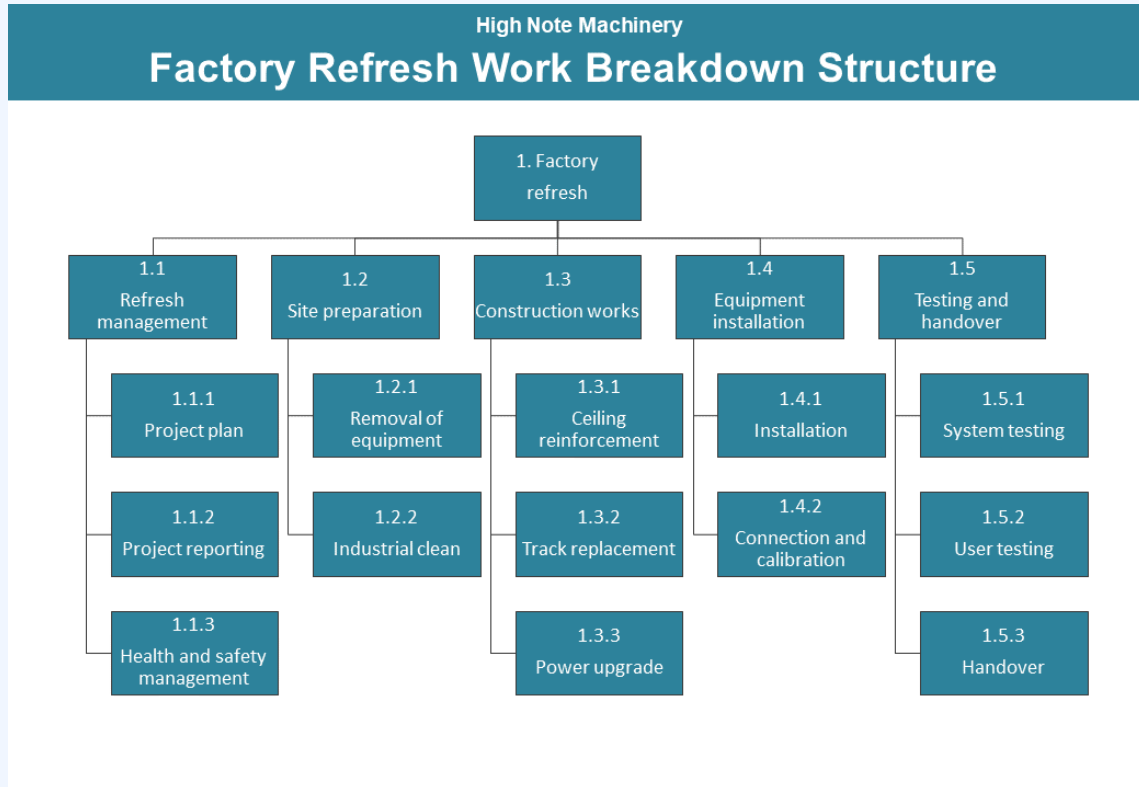


+/- 15% Plan tolerances prior to escalation



+/- 20% Plan tolerances prior to escalation

Example B: Hierarchy of items

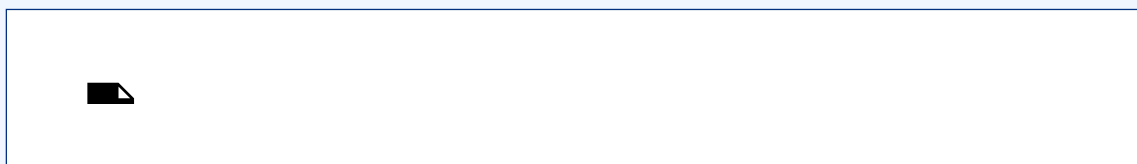


Guidelines for tailoring the archetype

Archetype	Hierarchy of items
Purpose	<p>This visual archetype is to communicate how something is broken down into smaller and smaller parts. This may include:</p> <ul style="list-style-type: none"> • organisations (as in an organisational chart of staff roles) • scope of a project (as in a work breakdown structure) • issues or risks (similar to root cause analysis)
Information you will need	<ul style="list-style-type: none"> • The components in the hierarchy • The groups of these components/how they are related
Tips	<ul style="list-style-type: none"> • You can annotate features/characteristics of the components using icons (use a legend to explain the icons) • Microsoft Office SmartArt has a variety of adaptable hierarchy options otherwise these can be created through lines and rectangles (or another shape) • You may choose to add arrows to show the direction of the 'flow'
Page layout	<ul style="list-style-type: none"> • Landscape will be most suitable if you have a larger number of high-level groupings than sub-components • Portrait will be most suitable if you have a larger number of sub-components than high-level groupings
Text	<ul style="list-style-type: none"> • Each component and group of components will require a label
Imagery	<ul style="list-style-type: none"> • Each component and group of components will be a shape - for example, a rectangle • Connect the shapes to show their relationship using straight lines (arrows are not recommended unless there is a definite flow)
Colour	<ul style="list-style-type: none"> • There is no specific use of colour for this archetype • Often a single colour will be appropriate for all shapes • You can also use a different colour for different groups of components
Legend	<p>Use a legend for:</p> <ul style="list-style-type: none"> • explaining the colour used to represent the different groups • any icons/annotations you might use on the diagram to show features about the components or groups
Notes	<ul style="list-style-type: none"> • If there is one component in the hierarchy that you want to breakdown further but this further breakdown is not applicable to all components, consider creating a second diagram and using an annotation/note to link the diagram

Example A: Hierarchy of items (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.





An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=328#h5p-22>

Example B: Hierarchy of items (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=328#h5p-23>

'Hierarchy of items' templates

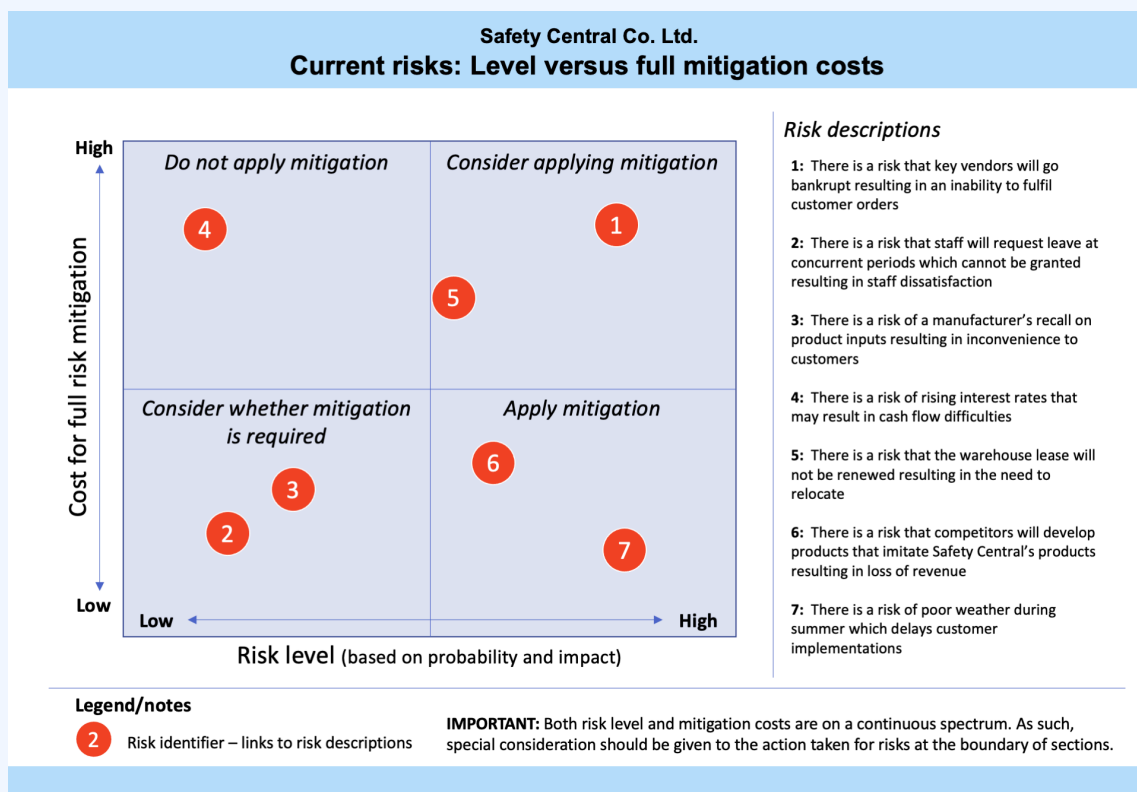
The templates shown above are freely available for you to use and adapt. You can download them using the links below:

- Example A: Hierarchy of items
- Example B: Hierarchy of items

ARCHETYPE 10: COMPARISON OF RELATIVE VALUES

This visual archetype plots two variables associated with a set of concepts against an x and y axis in a grid. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.

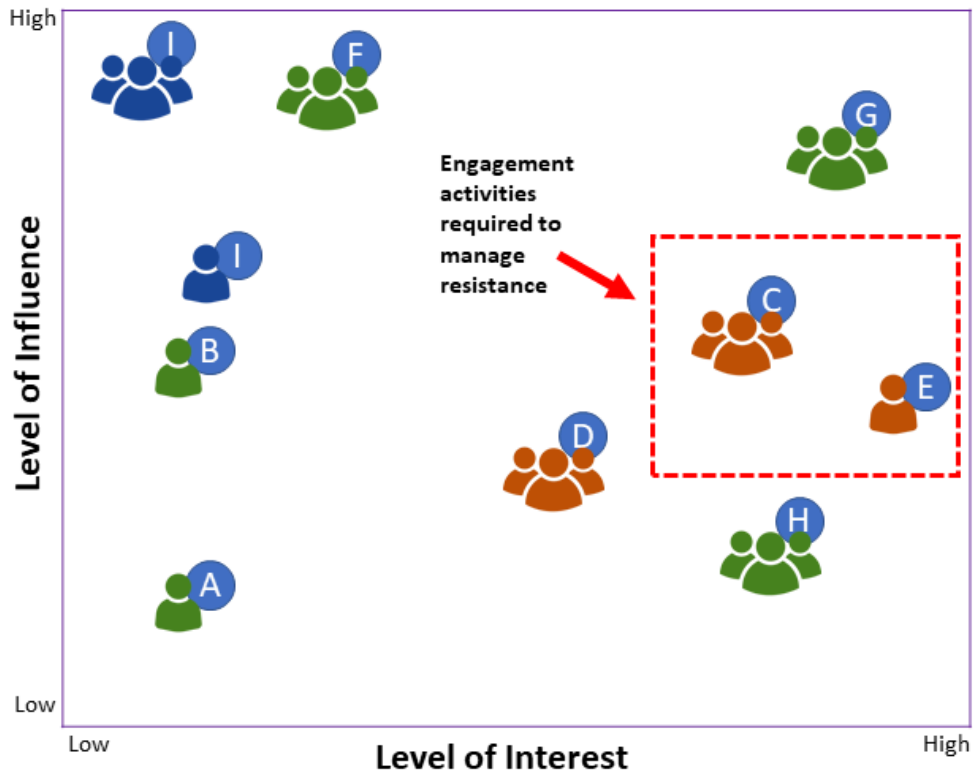
Example A: Comparison of relative values



Example B: Comparison of relative values

Clarity Water Services Desalination Transition Project: Stakeholder Map

Map of stakeholder influence, interest and support



Stakeholders

- A: Council Member
- B: Council Mayor
- C: Local Residents Group
- D: Media
- E: Plant Manager
- F: Program Board
- G: Project Board
- H: Salt Stream Supplier
- I: State Government Member
- J: Utilities Board

Legend

- Individual
 - Group or Committee
- Current level of support*
- Resistant
 - Neutral
 - Supportive

Explanation

Efforts are required to engage the Local Residents Group and Plant Manager who have high interest and moderate influence

Guidelines for tailoring the archetype

Archetype	Comparison of relative values
Purpose	<p>This visual archetype plots two variables associated with a set of concepts against an x and y axis in a grid. It is similar to a 2 x 2 matrix. Uses may include plotting:</p> <ul style="list-style-type: none"> • a project’s risks in terms of probability versus impact (or other variables) • a program’s projects in terms of cost versus benefits (or other variables) • stakeholder’s interest versus influence/power in relation to a project
Information you will need	<ul style="list-style-type: none"> • The list of concepts (e.g. projects, risks, stakeholders, etc.) to compare • The two (or more – refer to the Tips below) variables that you are comparing for each concept
Tips	<p>You can have additional variables (up to 4) that you can represent through shape and colour, for example:</p> <ul style="list-style-type: none"> • x axis placement: risk probability • y axis placement: risk impact • colour: type of risk (business, client etc.) • shape (rectangle versus circle) or iconography: risk has been treated versus risk has not been treated
Page layout	<ul style="list-style-type: none"> • Either landscape or portrait is possible • If portrait, the description list for the concepts will likely be at the bottom of the grid • If landscape, the description list for the concepts will likely be to the side of the grid
Text	<ul style="list-style-type: none"> • Ensure that each concept is given a description (to the side or below the grid) • Axis to be labelled with the variable they represent and with an indication of the spectrum (e.g. high versus low)
Imagery	<ul style="list-style-type: none"> • Plot the concepts on a square grid • Each concept is represented as a shape (a circle is standard) • You may choose to create a 2 x 2 matrix with lines
Colour	<ul style="list-style-type: none"> • There is no specific use of colour for this archetype • Often a light colour will be useful for the background grid • Different colours may be used to colour the shape of the plotted concepts if more than two variables are being shown
Legend	<p>Use a legend for:</p> <ul style="list-style-type: none"> • explaining any variables beyond the x and y axes • any notes/cautions/assumptions regarding the plot
Notes	<ul style="list-style-type: none"> • Be cautious with lines that create the 2 x 2 matrix - often variables are continuous and if a concept is on the edge of a matrix line the required action/classification may require review

Example A: Comparison of relative values (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=344#h5p-24>

Example B: Comparison of relative values (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=344#h5p-25>

'Comparison of relative values' templates

The templates shown above are freely available for you to use and adapt. You can download them using the links below:

- Example A: Comparison of relative values
- Example B: Comparison of relative values

Please note: The icons in Example B are sourced from Noun Project and are licensed under a Creative Commons Attribution licence:

- Individual person: Person by Alice Design
- Group: Team by Creative Stall

ARCHETYPE 11: PICTORIAL - CONTRIBUTIONS OF PARTS TO OUTCOMES

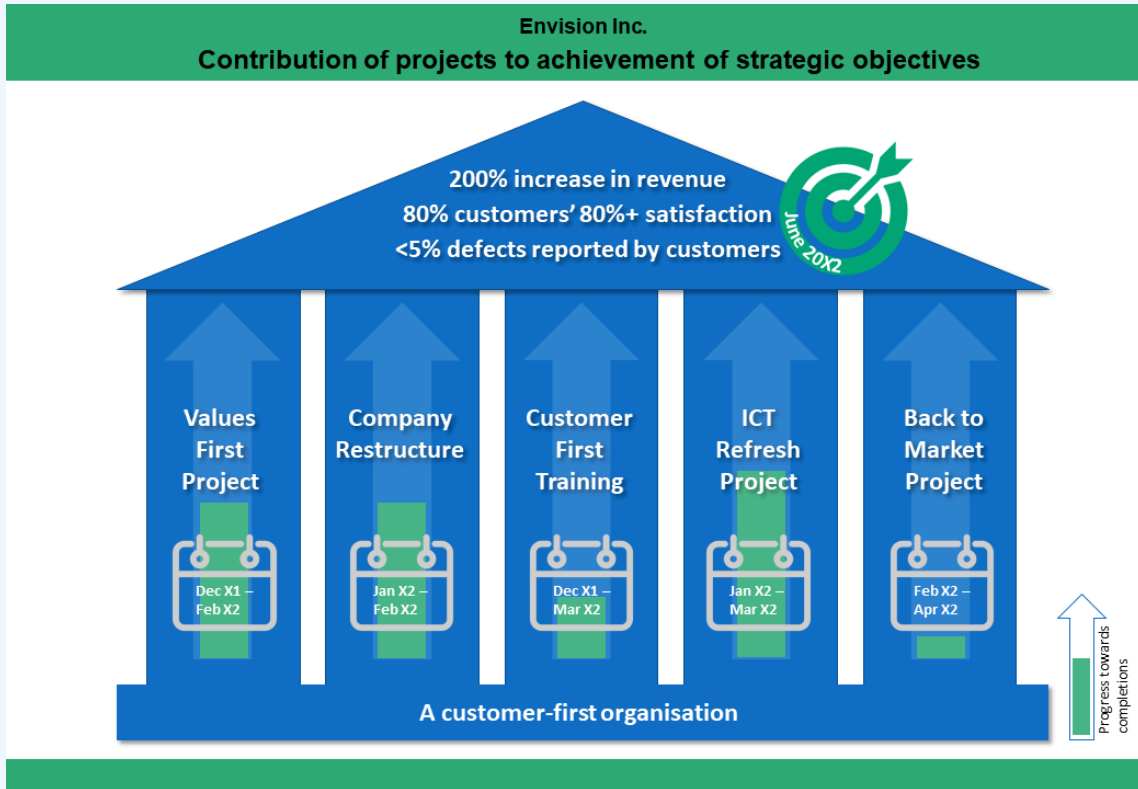
This visual archetype communicates how a vision will be achieved in a strongly pictorial format. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.

Example A: Pictorial – contributions of parts to outcomes



Example B: Pictorial – contribution of parts to

outcomes



Guidelines for tailoring the archetype

Archetype	Pictorial - comparison of parts to outcomes
Purpose	<p>This visual archetype communicates how a vision will be achieved in a strongly pictorial format. This may include:</p> <ul style="list-style-type: none"> • how a group of projects contribute to an overall vision • how a group of activities contribute to a project deliverable • how a group of changes/activities enable the achievement of a KPI <p>It has similarities to Archetype 7 however this is a more pictorial representation.</p>
Information you will need	<ul style="list-style-type: none"> • The group of components contributing to the outcome • The outcome • Any additional details about the components you want to highlight
Tips	<ul style="list-style-type: none"> • You can annotate features/characteristics of the components using icons (you may need to use a legend to explain the icons)
Page layout	<p>Either landscape or portrait is possible depending on the pictorial choice, for example:</p> <ul style="list-style-type: none"> • pillar/building concept – suited to landscape • pathway/road leading to outcome – suited to landscape • target in centre with arrows pointing towards centre – suited to either landscape or portrait
Text	<ul style="list-style-type: none"> • Each component and the outcome will require a label
Imagery	<ul style="list-style-type: none"> • As this component is pictorial the background graphic is a central choice (e.g. a road/path, a target, pillars in a structure, jigsaw pieces, steps with an arrow going upwards, etc.), around/within which you will place the text
Colour	<ul style="list-style-type: none"> • There is no specific use of colour for this archetype
Legend	<p>Use a legend for:</p> <ul style="list-style-type: none"> • any icons/annotations you might use for features/characteristics in the components
Notes	<ul style="list-style-type: none"> • Ensure that you use a simple background graphic otherwise text and any graphical annotations may become difficult to read

Example A: Pictorial – contributions of parts to outcomes (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=362#h5p-26>

Example B: Pictorial – contribution of parts to outcomes (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=362#h5p-27>

'Pictorial – contribution of parts to outcomes' templates

The templates shown above are freely available for you to use and adapt. You can download them using the links below:

- Example A: Pictorial – contribution of parts to outcomes
- Example B: Pictorial – contribution of parts to outcomes

Please note: The icons in Example B are sourced from Noun Project and are licensed under a Creative Commons Attribution licence:

- Target by Gregor Cresnar










ARCHETYPE 12: PROGRESS TRACKING

This visual archetype is to communicate progress of activities. The editable PowerPoint files for the examples of this archetype are provided at the end of this chapter for you to use and adapt, along with annotated versions of the archetypes to show the key elements in their design.



Example A: Progress tracking

Billabong Enterprises Reforestation Program – Risk Treatment Progress

This table shows progress towards implementation of risk treatments. Risks which have a high pre-mitigation rating and poor treatment implementation progress have been marked for escalation (refer status column).

Risk # (and Pre-Mitigation Rating)	Treatment for implementation	Implementation progress (0%, 25%, 50%, 75%, 100%)	Responsible Officer	Status
3 <i>Med</i>	Securing second supplier for flora	<div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div>	Shane	
6 <i>Low</i>	Implementation of on call ranger process	<div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div>	Shane	
7 <i>High</i>	Increased frequency of drone monitoring	<div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div>	Maria	
9 <i>High</i>	Monthly town hall meetings	<div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div>	Tony	
15 <i>Low</i>	Onboarding of wildlife team	<div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div>	Shane	
20 <i>Med</i>	Removal of mesh fencing from site	<div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div>	June	
21 <i>Low</i>	Quarterly soil testing	<div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div>	Shane	
23 <i>Med</i>	Revised planting schedule	<div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div>	Maria	
25 <i>High</i>	Evening police patrols	<div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div> <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black;"></div>	Shane	

Legend

Risk rating <div style="display: inline-block; width: 15px; height: 15px; background-color: #90EE90; border: 1px solid black; margin-right: 5px;"></div> Low <div style="display: inline-block; width: 15px; height: 15px; background-color: #FFD700; border: 1px solid black; margin-right: 5px;"></div> Medium <div style="display: inline-block; width: 15px; height: 15px; background-color: #FF0000; border: 1px solid black; margin-right: 5px;"></div> High	Progress legend <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black; margin-right: 5px;"></div> Not started <div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black; margin-right: 5px;"></div> 25% complete <div style="display: inline-block; width: 25px; height: 25px; background-color: green; border: 1px solid black; margin-right: 5px;"></div> Complete	Status icons <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black; border-radius: 50%; text-align: center; vertical-align: middle; margin-right: 5px;"></div> On track <div style="display: inline-block; width: 25px; height: 25px; background-color: white; border: 1px solid black; border-radius: 50%; text-align: center; vertical-align: middle; margin-right: 5px;"></div> Escalation required
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Example B: Progress tracking

Shining Stars Talent Agency					
Photographic Studios Transformation Program - Progress by Project as at 18 Mar 20X1					
Project	Planned start 20X1	Actual start	Percentage complete	Planned finish 20X1	Anticipated finish
Studio refurbishment project <i>(PM: Billy Smith)</i>	01 Jan	15 Jan	<div style="width: 20%;"><div style="width: 20%;"></div></div> 20%	30 Jun	15 Jul
Contemporary practices project <i>(PM: Erica Jones)</i>	15 Mar	15 Mar	<div style="width: 2%;"><div style="width: 2%;"></div></div> 2%	30 Jun	30 Jun
Organisational restructure project <i>(PM: Erica Jones)</i>	30 Apr	Yet to commence	<div style="width: 0%;"><div style="width: 0%;"></div></div> 0%	30 Jun	30 Jun
Service line relaunch project <i>(PM: Petrea Watkins)</i>	15 May	Yet to commence	<div style="width: 0%;"><div style="width: 0%;"></div></div> 0%	30 Jul	30 Jul
Archive and consolidation project <i>(PM: Billy Smith)</i>	01 Jan	10 Mar	<div style="width: 5%;"><div style="width: 5%;"></div></div> 5%	30 May	30 Jun

Legend

Days variation on planned start and finish:

-
 Ahead or < 5 days delay
-
 6 – 14 days delay
-
 14+ days delay

PM = Project Manager

The Photographic Studios Transformation Program will result in a new service line for Shing Stars Talent Agency that is planned to increase revenue by 25% per annum

Guidelines for tailoring the archetype

Archetype	Progress tracking
Purpose	<p>This visual archetype is to communicate progress of activities. This may include how:</p> <ul style="list-style-type: none"> • a group of projects within a program are progressing • a group of activities within a project are progressing • a list of tasks such as implementing risk treatments are progressing <p>Archetypes such as 4, 8, 9 and 12 can include annotations that indicate progress, however, in this archetype the primary purpose of the visual is to compare progress across activities.</p>
Information you will need	<ul style="list-style-type: none"> • The activities you want to report upon • The progress compared to their start and planned finish • Any additional context/variables (e.g. name of responsible officer, or status indicator) you want to communicate
Tips	<ul style="list-style-type: none"> • You can annotate additional variables (e.g. risk level or budget status) using icons (you may need to use a legend to explain the icons)
Page layout	<p>Either landscape or portrait is possible depending on the number of activities and amount of additional context/variables, for example:</p> <ul style="list-style-type: none"> • many activities with few additional context/variables – suited to portrait • few activities with many additional context/variables – suited to landscape
Text	<ul style="list-style-type: none"> • Each activity will have a short description • Start and finish dates may also be noted as additional context
Imagery	<ul style="list-style-type: none"> • Use a box/boxes to indicate progress for each activity • The amount of shading of the box/boxes indicates the degree of progress - minimal shading indicates less progress, greater shading indicates more progress • Progress should be indicated as increasing from left to right
Colour	<ul style="list-style-type: none"> • Use dashboard (red, orange, green) colouring to indicate delays or schedule status
Legend	<p>Use a legend for:</p> <ul style="list-style-type: none"> • any icons/annotations you might use and to describe how status is represented
Notes	<ul style="list-style-type: none"> • A table can provide an efficient framework for this archetype and help in ensuring consistent alignment • This archetype could be combined with another archetype on a single page if there are only a few activities to include

Example A: Progress tracking (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it

online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=377#h5p-28>

Example B: Progress tracking (with annotations)

Click the blue information buttons on the diagram below to see annotations explaining the reasons for choosing these visual elements.



An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://usq.pressbooks.pub/visualsforprojectmanagement/?p=377#h5p-29>

'Progress tracking' templates

The templates shown above are freely available for you to use and adapt. You can download them using the links below:

- Example A: Progress tracking
- Example B: Progress tracking

Please note: The icons in Example B are sourced from Noun Project and are licensed under a Creative Commons Attribution licence:

- Tick by Kiran Shastry
- Hazard by Adrien Coquet

REFERENCES

- Adams, S., Dawson, P., Foster, J., & Seddon, T. (2012). *Thou shall not use Comic Sans: 365 graphic design commandments*. University of NSW Press.
- Alam, M., Gale, A., Brown, M., & Khan, A. I. (2010). The importance of human skills in project management professional development. *International Journal of Managing Projects in Business*, 3(3): 495–516. <https://doi.org/10.1108/17538371011056101>
- Alin, P., Iorio, J., & Taylor, J. E. (2013). Digital boundary objects as negotiation facilitators: Spanning boundaries in virtual engineering project networks. *Project Management Journal*, 44(3). 48–63. <https://doi.org/10.1002/pmj.21339>
- Aslam, M. M. (2006). Are you selling the right colour? A cross-cultural review of colour as a marketing cue. *Journal of Marketing Communications*, 12(1). 15–30. <https://doi.org/10.1080/13527260500247827>
- Avgerinou, M. D., & Petterson, R. (2011). Toward a cohesive theory of visual literacy. *Journal of Visual Literacy*, 30(2). 1–19. <https://doi.org/10.1080/23796529.2011.11674687>
- Baddeley, A. (2006). Working memory: An overview. In S. J. Pickering (Ed.), *Working memory and education*. Academic Press. <https://doi.org/10.1016/B978-012554465-8/50003-X>
- Baddeley, A., Hitch, G., & Allen, R. (2020). A multicomponent model of working memory. In R. Logie, V. Camos, & N. Cowan (Eds.), *Working memory: The state of the science*. Oxford University Press. <https://doi.org/10.1093/oso/9780198842286.003.0002>
- Barrett, M., & Oborn, E. (2010). Boundary object use in cross-cultural software development teams. *Human Relations*, 63(8). 1199–221. <https://doi.org/10.1177/0018726709355657>
- Bell, E., & Davison, J. (2013). Visual management studies: Empirical and theoretical approaches. *International Journal of Management Reviews*, 15(2), 167–184. <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-2370.2012.00342.x>
- Beynon-Davies, P., & Lederman, R. (2015, September 8–10). *Theorising visual management* [Paper presentation]. BAM 2015: The value of pluralism in advancing management research, education and practice, Portsmouth, United Kingdom. [https://people.eng.unimelb.edu.au/reevaml/Visual%20management%20-%20BAM2015%20-%201%20\(2\).pdf](https://people.eng.unimelb.edu.au/reevaml/Visual%20management%20-%20BAM2015%20-%201%20(2).pdf)
- Borland, D., Wang, W., & Gotz, D. (2018). Contextual visualization. *IEEE Computer Graphics and Applications*, 38(6), 17–23. <https://doi.org/10.1109/MCG.2018.2874782>
- Burnes, B., & Cooke, B. (2013). Kurt Lewin's field theory: A review and re-evaluation. *International Journal of Management Reviews*, 15(4), 408–425. <https://doi.org/10.1111/j.1468-2370.2012.00348.x>
- Casaponsa, A., & Athanasopoulos, P. (2018, April 16). The way you see colour depends on what language you speak. *The Conversation*. <https://theconversation.com/the-way-you-see-colour-depends-on-what-language-you-speak-94833>
- Chen, O., & Kalyuga, S. (2020). Cognitive load theory, spacing effect, and working memory resources depletion:

- Implications for instructional design. In S. Hai-Jew (Ed.), *Form, function, and style in instructional design: Emerging research and opportunities*. IGI Global. <https://doi.org/10.4018/978-1-5225-9833-6.ch001>
- Clark, J. M., & Paivio, A. (1991). Dual coding theory and education. *Educational Psychology Review*, 3(3), 149–210. <https://doi.org/10.1007/BF01320076>
- Clark, R. C., Nguyen, F., and Sweller, J. (2006). *Efficiency in learning evidence-based guidelines to manage cognitive load*. Pfeiffer.
- Collins, W., Haas, A., Jeffrey, K., Martin, A., Medeiros, R., & Tomljanovic, S. (2015). *Graphic design and print production fundamentals*. BCcampus Open Education. <https://open.umn.edu/opentextbooks/textbooks/graphic-design-and-print-production-fundamentals>
- Comi, A., & Whyte, J. (2018). Future making and visual artefacts: An ethnographic study of a design project. *Organization Studies*, 39(8), 1055–1083. <https://doi.org/10.1177/0170840617717094>
- Cuskley, C., Simner, J., & Kirby, S. (2017). Phonological and orthographic influences in the bouba–kiki effect. *Psychological Research*, 81(1), 119–130. <https://doi.org/10.1007/s00426-015-0709-2>
- Davison, J. (2015). Visualising accounting: an interdisciplinary review and synthesis. *Accounting and Business Research*, 45(2), 121–165. <https://doi.org/10.1080/00014788.2014.987203>
- Debicki, B. J. (2015). Forgotten contributions to scientific management: work and ideas of Karol Adamiecki. *Journal of Management History*, 21(1), 40–67. <https://doi.org/10.1108/JMH-09-2013-0043>
- Dewan, P. (2015). Words versus pictures: Leveraging the research on visual communication. *Partnership: The Canadian Journal of Library and Information Practice and Research*, 10(1). <https://doi.org/10.21083/partnership.v10i1.3137>
- Di Marco, M. K., Alin, P., & Taylor, J. E. (2012). Exploring negotiation through boundary objects in global design project networks. *Project Management Journal*, 43(3), 24–39. <https://doi.org/10.1002/pmj.21273>
- Ewenstein, B., & Whyte, J. (2009). Knowledge practices in design: The role of visual representations as ‘epistemic objects’. *Organization Studies*, 30(1), 7–30. <https://doi.org/10.1177/0170840608083014>
- Geraldi, J. G., & Arlt, M. (2015). *Visuals matter! Designing and using effective visual representations to support project and portfolio decisions*. Project Management Institute.
- Goransson, K., & Fagerholm, A-S. (2017). Towards visual strategic communications: An innovative interdisciplinary perspective on visual dimensions within the strategic communications field. *Journal of Communication Management*, 22(1), 46–66. <https://doi.org/10.1108/JCOM-12-2016-0098>
- Griffin, R. E. & Takakuwa, Y. (1995). *Using symbols in international business presentations: How well are they understood?* International Visual Literacy Association. <https://eric.ed.gov/?id=ED380079>
- Hoezen, M., Voordijk, H., & Dewulf, G. (2013). Formal bargaining and informal sense making in the competitive dialogue procedure. *International Journal of Managing Projects in Business*, 6(4), 674–694. <https://doi.org/10.1108/IJMPB-06-2012-0030>
- Iorio, J., & Taylor, J. E. (2014). Boundary object efficacy: The mediating role of boundary objects on task conflict in global virtual project networks. *International Journal of Project Management*, 32(1), 7–17. <https://doi.org/10.1016/j.ijproman.2013.04.001>
- Janik, L., & Kaner, S. (2018). Art and the brain: Archaeological perspectives on visual communication. *Open Archaeology*, 4(1), 145–151. <https://doi.org/10.1515/opar-2018-0009>
- Jonauskaitė, D., Wicker, J., Mohr, C., Dael, N., Havelka, J., Papadatou-Pastou, M., Zhang, M., & Oberfeld, D.

- (2019). A machine learning approach to quantify the specificity of colour–emotion associations and their cultural differences. *Royal Society Open Science*, 6(9), Article 190741, 1–19. <https://doi.org/10.1098/rsos.190741>
- Killen, C. P. (2017). Managing portfolio interdependencies: The effects of visual data representations on project portfolio decision making. *International Journal of Managing Projects in Business*, 10(4), 856-879. <https://doi.org/10.1108/IJMPB-01-2017-0003>.
- Killen C. P. (2022). Visualising data for portfolio decision making. In K. Angliss & P. Harpum (Eds.). *Strategic Portfolio Management in the multi-project and program organisation*. Routledge.
- Killen, C. P., & Kjaer, C. (2012). Understanding project interdependencies: Exploring the role of visual representation, culture and process. *International Journal of Project Management*, 30(5), 554–566. <https://doi.org/10.1016/j.ijproman.2012.01.018>
- Klingberg, T. (2009). *The overflowing brain information overload and the limits of working memory*. Oxford University Press.
- Koskela, L., Tezel, A., & Tzortzopoulos, P. (2018, July 18–22). *Why visual management [Paper presentation]*. 26th Annual Conference of the International Group for Lean Construction, Chennai, India. <https://iglc.net/Papers/Details/1548>
- Lacher, M. (2019). *Business computers 365*. Minnesota Libraries Publishing Project. <https://mlpp.pressbooks.pub/businesscomputers2019/>
- Latour, B. (1986). Visualisation and cognition: Drawing things together. *Knowledge and Society Studies in the Sociology of Culture Past and Present*, 6(1), 1–40. <http://www.bruno-latour.fr/sites/default/files/21-DRAWING-THINGS-TOGETHER-GB.pdf>
- Lawson, K. (2015). *The trainer's handbook* (4th ed.). John Wiley & Sons, Inc.. <https://doi.org/10.1016/10.1002/9781119216155>
- Maire, S., & Liarte, S. (2018). Building on visuals: Taking stock and moving ahead. *M@n@gement*, 21(4), 1405–1423. <https://www.cairn.info/revue-management-2018-4-page-1405.htm>
- McCandless, C. (2010, July). *The beauty of data visualization* [Video]. TED Global 2010. https://www.ted.com/talks/david_mccandless_the_beauty_of_data_visualization?language=en
- McCandless, D. (2012). *The visual miscellaneum: A colorful guide to the world's most consequential trivia*. HarperCollins.
- Meyer, R. E., Höllerer, M. A., Jancsary, D., & Van Leeuwen, T. (2013). The visual dimension in organizing, organization, and organization research: Core ideas, current developments, and promising avenues. *The Academy of Management Annals*, 7(1), 489–555. <https://doi.org/10.1080/19416520.2013.781867>
- Mizrahi, J. (2015). *Writing for the workplace: Business communication for professionals*. Business Expert Press.
- Mosaic Project Services. (2006). *Stakeholder Circle tools*. Mosaic Projects. <https://mosaicprojects.com.au/shop-SHC-tools.php>
- Ou, L-C., Luo, M. R., Woodcock, A., & Wright, A. (2004). *A study of colour emotion and colour preference. Part II: colour emotions for two-colour combinations*. *Color Research and Application*, 29(4), 292–98. <https://doi.org/10.1002/col.20024>
- Paivio, A. (1971). *Imagery and verbal processes*. Holt, Rinehart & Winston.

- Paivio, A., & Csapo, K. (1969). Concrete image and verbal memory codes. *Journal of Experimental Psychology*, 80(2, Pt.1), 279–285. <https://doi.org/10.1037/h0027273>
- Paivio, A., & Csapo, K. (1971). Short-term sequential memory for pictures and words. *Psychonomic Science*, 24(2), 50–51. <https://doi.org/10.3758/BF03337887>
- Phillips, J. C., & Phillips, J. C. (2014). *Graphic design: The new basics*. Princeton Architectural Press.
- Poulin, R. (2011). *The language of graphic design: An illustrated handbook for understanding fundamental design principles*. Quarto Publishing Group.
- Robles, V. D. (2018). Visualizing certainty: What the cultural history of the Gantt chart teaches technical and professional communicators about management. *Technical Communication Quarterly*, 27(4), 300–321. <https://doi.org/10.1080/10572252.2018.1520025>
- Simon, H. A. (1971). Designing organisations for an information rich world. In M. Greenberger (Ed.), *Computers, Communications, and the Public Interest*. Johns Hopkins Press.
- Snyder, J. L. (2014). *Today's business communication: A how-to guide for the modern professional*. Business Expert Press.
- Stevenson, D. H., & Starkweather, J. A. (2010). PM critical competency index: IT execs prefer soft skills. *International Journal of Project Management*, 28(7), 663–671. <https://doi.org/10.1016/j.ijproman.2009.11.008>
- Tezel, A., Koskela, L., & Tzortzopoulos, P. (2016). Visual management in production management: A literature synthesis. *Journal of Manufacturing Technology Management*, 27(6), 766–799. <https://doi.org/10.1108/JMTM-08-2015-0071>
- Thomas, N. J. T. (2021). Mental imagery. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Spring 2021 ed.). Stanford University. <https://stanford.library.sydney.edu.au/archives/spr2021/entries/mental-imagery/>
- Tufte, E. R. (1983). *The visual display of quantitative information*. Graphics Press.
- Tufte, E. R. (2006). *Beautiful evidence*. Graphics Press LLC.
- Turner, M. (2016). Beyond the iron triangle: Reflections of an early career academic. *International Journal of Managing Projects in Business*, 9(4), 892–902. <https://doi.org/10.1108/IJMPB-01-2016-0005>
- Van Der Hoorn, B. (2016a). Discussing project status with the project-space model: An action research study. *International Journal of Project Management*, 34(8), 1638–1657. <https://doi.org/10.1016/j.ijproman.2016.09.001>
- Van Der Hoorn, B. (2016b). The Project-space Model: Visualising the enablers and constraints for a given project. *International Journal of Project Management*, 34(2), 173–186. <https://doi.org/10.1016/j.ijproman.2015.10.006>
- Van Der Hoorn, B. (2020). Seeing the bigger picture: Conditions that influence effective engagement of project executives with visuals. *International Journal of Project Management*, 38(2), 137–151. <https://doi.org/10.1016/j.ijproman.2020.01.005>
- Van Der Hoorn, B., & Whitty, S. (2017a). The praxis of ‘alignment seeking’ in project work. *International Journal of Project Management*, 35(6), 978–993. <https://doi.org/10.1016/j.ijproman.2017.04.011>
- Van Der Hoorn, B., and Whitty, S (2017b). The project-space model: Enhancing sensemaking. *International Journal of Managing Projects in Business*, 10(1), 185–202. <https://doi.org/10.1108/IJMPB-05-2016-0039>
- Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization Science*, 16(4), 409–421. <https://doi.org/10.1287/orsc.1050.0133>

- Whitty, S. J. (2010). Project management artefacts and the emotions they evoke. *International Journal of Managing Projects in Business*, 3(1), 22–45. <https://doi.org/10.1108/17538371011014017>
- Whyte, J. (2008). Visualization and the design of services. In L. Kimbell & V. P. Seidel, *Designing for services – Multidisciplinary perspectives, Proceedings from the Exploratory Project on Designing for Services in Science and Technology-based Enterprises*, Saïd Business School. University of Oxford. 47.
- Winter, M., & Szczepanek, T. (2009). *Images of projects*. Gower Publishing, Ltd.
- Wolch, G., Ghosh, S., Boyington, C., Watanabe, S. M., Fainsinger, R., Burton-Macleod, S., Thai, V., Thai, J., & Fassbender, K. (2017). Impact of adding a pictorial display to enhance recall of cancer patient histories: A randomized trial. *Journal of Pain and Symptom Management*, 53(1), 109–115. <https://doi.org/10.1016/j.jpainsymman.2016.11.001>
- Yang, S-B., Hlee, S., Lee, J., & Koo, C. (2017). An empirical examination of online restaurant reviews on Yelp.com: A dual coding theory perspective. *International Journal of Contemporary Hospitality Management*, 29(2), 817–839. <https://doi.org/10.1108/IJCHM-11-2015-0643>

ACKNOWLEDGMENTS

This book's publication was made possible by a community of amazing people to whom I am enormously grateful.

My sincere thanks to Nikki Andersen and Samara Rowling who have shared their expertise in publishing and worked tirelessly to bring my vision for this volume to life. Thank you for always balancing the practicalities with my hopes for this book's purpose. I am also grateful to Samara Hoffmann, whose cartoons bring a witty summary to each chapter. Thank you to Adrian Stagg and the USQ Library team who believed in the value of the proposal and supported its realisation.

Friends and family and formal peer reviewers who read and provided feedback on the book have been instrumental in achieving the finished product. Thank you for your honesty and constructive suggestions. The volume has been improved by your considered input.

Finally, my appreciation to all those research participants, colleagues and students who have been instrumental in informing this work (and my research more broadly). You are a constant source of inspiration and I hope this book is of some benefit to you and your colleagues.