



# Seeing the bigger picture: Conditions that influence effective engagement of project executives with visuals

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## ABSTRACT

This exploratory study provides an influence diagram that shows the network of conditions that influence the use of visuals to effectively engage executives. The diagram was developed from the experiences of project managers and executives elicited through twenty-four semi-structured interviews. Twenty-nine conditions are found to influence the use of visuals to effectively engage executives. These are grouped into four categories: the executive's disposition to the use of visuals; the organisational conditions to create visuals; the project manager's understanding of the executive's information needs; and the executive's and project manager's appreciation of the benefits of using visuals. The study's results highlight that while the interviewed executives had a predisposition to the use of visuals as they are generally time-poor, capability to create visuals to support executive engagement was not widespread. Practical contributions include disclosing the criticality of organisational support for creating visuals and the vulnerability of executives in making project decisions.

## 1. Introduction

This exploratory study provides a diagram that illustrates the relationship between the various conditions that influence the use of visuals by project managers to effectively engage executives. This area of study is important, given that executive sponsorship and support is a critical success factor for projects (see, for example, Ahmed, Mohamad, and Ahmad (2016); Englund and Bucero (2016); Fernandes, Ward, and Araújo (2015)). Furthermore, the ability to bring stakeholders such as executives onto 'the same page' is a core competency for project managers (Oleary & Williams, 2013; van der Hoorn & Whitty, 2017b). The focus on engagement with visuals is timely, given the calls to ensure that exploration of organisational phenomena extends beyond the linguistic to include the visual (see, for example, Bell and Davison (2013); Meyer, Höllerer, Jancsary, and van Leeuwen (2013)).

Maire and Liarte (2018, p. 1407) argue "[o]mitting visuals from management studies results in an incomplete understanding of everyday life." Visuals frequently appear to be cognitively advantageous compared to representation of information in text or tabular formats (Davison, 2015; Goransson & Fagerholm, 2017; Proskurina, 2018). This is considered particularly important in the executive context, given that managers are reported to experience information overload (Yigitbasioglu & Velcu 2012). Within the project management discourse, lab-style simulation experiments highlight the cognitive advantages of visuals in

portfolio decision-making (Gerald & Arlt, 2015; Killen, 2013, 2017). Other studies show benefits from visuals acting as boundary objects (refer Section 2.4) in project work (see, for example, Alin, Iorio, and Taylor (2013); Beckett (2015); Fuller, Thorpe, & Dainty, (2011)). However, the debate continues over the effectiveness of visuals in practice to support activities such as sensemaking, negotiation and conflict resolution. Given the criticality of engaging executive stakeholders in project work, this research explores the question: *What are the conditions that influence the effective use of visuals by project managers to engage executive stakeholders in project work, and what are the relationships between these conditions?*

The definition of visual in this study aligns with Maire and Liarte (2018) and includes paintings, drawings, charts, diagrams, and photography. It also aligns with Davison (2015), in that visuals can be both 2D and 3D and may be static or have motion. The research question was addressed by interviewing project managers and executives who hold sponsorship roles in project work. A total of twenty-four participants from diverse industries across Australia were interviewed and their interview transcripts analysed following Braun and Clarke's (2006) protocol for thematic analysis. An influence diagram shows the results of the thematic analysis, with twenty-nine conditions identified that influence the use of visuals by project managers to engage executives. These influencing conditions are grouped into four categories: the executive's disposition to the use of visuals; the organisational conditions to create

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visuals; the project manager's understanding of the executive's information needs; and the executive's and project manager's appreciation of the benefits of using visuals.

This research provides important theoretical contributions by validating existing knowledge and introducing new insights regarding the use of visuals in project work. The depiction of thematic analysis outputs in an influence diagram is a methodological contribution that reveals how it is the coupling of twenty-nine influencing conditions that enable visuals to be used as an effective (or less effective) engagement device. Contributions are also made to practice in the form of insight into the underdeveloped capability of project managers to create visuals and potential vulnerability of executives when making decisions, given their time-poor status and possible lack of relevant domain knowledge.

The structure of the paper is as follows. To begin, the literature that situates the study is summarised and the research question is stated. Next, the study methodology is described and the results presented. To conclude, the results are discussed and their implications and limitations provided.

## 2. Literature review

### 2.1. The importance of engaging executives in project work

There is a critical need for project managers to engage meaningfully with the executive stakeholders involved in their initiatives. This claim is justified by the extant recognition of the criticality of executive management support and sponsorship for project success (Ahmed et al., 2016; Englund & Bucero, 2016; Fernandes et al., 2015), and by the growing interest in sensemaking in the project management literature (see, for example, Oleary and Williams (2013); van der Hoorn and Whitty (2017b)). Sensemaking is a process that enables us to build an understanding of a situation from cues in the environment (Weick, Sutcliffe, & Obstfeld, 2005) and is a central activity for project managers to bring all stakeholders to a common understanding (Oleary & Williams, 2013; van der Hoorn & Whitty, 2017a). Given that senior management support is a key contributor to project success (Ahmed et al., 2016; Englund & Bucero, 2016; Kloppenborg, 2015; Yeoh & Popovic, 2016), and is found to be positively related to organisational project management capability in general (Fernandes et al., 2015), engagement practices with these executive stakeholders are of great interest to project managing discourse.

### 2.2. The visual turn in organisational studies

We are in an era of the visual turn (Bell & Davison, 2013; Davison, 2015; Meyer et al., 2013): a social scientific trend that appreciates the pervasiveness and power of the visual in our lives and sees images as worthy of scientific inquiry (Bell & Davison, 2013). However, exploration of the visual in organisational and management studies remains in its infancy (Beynon-Davies & Lederman, 2015; Davison, 2015; Goransson & Fagerholm, 2017; Maire & Liarte, 2018). Scholars (see, for example, Bell and Davison (2013); Goransson and Fagerholm (2017); Meyer et al. (2013)) have offered frameworks or agendas for exploring visuals in the organisational science and management areas. A growing number of journals (see, for example, *Visual Studies*, *Visual Communication* and *Visual Methodologies*) are also bringing attention to the visual in organisational studies and communications. In terms of how visuals can feature in research design and scholarly inquiry, Meyer et al. (2013) identifies five different approaches: archaeological, practice, strategic, dialogical and documenting. For reasons of brevity, this paper does not discuss these. However attention is drawn to the 'practice' approach, which is of particular importance to this study (Meyer et al., 2013). The practice approach is concerned with how visuals are socially meaningful objects used purposefully in organisational practices. This approach is associated with interviews and observational research methods (Meyer et al., 2013).

Visuals provide cognitive advantages (Davison, 2015; Goransson &

Fagerholm, 2017; Proskurina, 2018) and research in this area reflects the interdisciplinary roots of visual studies (Bell & Davison, 2013), which include psychological and cognitive sciences. In common parlance, this manifests in phrases such as "people think visually" (Proskurina, 2018, p. 1). Studies have highlighted the potential cognitive advantages of presenting information visually (Baadte & Meinhardt-Injac, 2019; Bresciani & Comi, 2017; Dansereau & Simpson, 2009; Larkin & Simon, 1987; Nelson, Reed, & Walling, 1976; Snodgrass & Asiaghi, 1977).

### 2.3. Visuals in project managing

Aligned with organisational and management studies generally, the examination of visuals in project practice is still in its infancy. A strategic perspective (see, Meyer et al. (2013)) is applied in three studies (Gerald & Arlt, 2015; Killen, 2013, 2017) to explore visuals in project management. A common feature of these studies is that their data is based on a simulation or experiment undertaken by students. These studies have provided important contributions to our understanding that visualised information is of greater value than textual or tabular information, specifically in terms of decision-making in portfolio management. Their findings reflect the cognitive advantages proposed in the literature more broadly. However, they also recognise that experimentation with students has limits in terms of assured translatability to project decision-makers in practice. A key outcome of Gerald and Arlt (2015) is that adherence to their proposed set of design principles in visuals (interpretive, purposeful, truthful, efficient and aesthetic) leads to improved cognition with the task at hand.

In-depth practice-based studies have been undertaken to increase understanding of *how* visuals are used. These studies have explored multiple visuals in a single case study (Ewenstein & Whyte, 2009) or a single type of visual in a single case study (Yakura, 2013), or a single type of visual in multiple cases (Chang, Hatcher, & Kim, 2013; Killen & Kjaer, 2012). Findings include that visuals are useful in facilitating interactions and/or decision-making (Ewenstein & Whyte, 2009; Killen & Kjaer, 2012; Yakura, 2002). Additionally, Yakura (2013) highlights the role of Microsoft PowerPoint presentations in making abstract concepts concrete in organisational settings. Chang et al. (2013) remind us that there can be complexity and administrative challenges associated with developing visuals that may hinder their use in practice. Conceptually, van der Hoorn and Whitty (2015) bring attention to the influence of visuals in project work and its management. They posit that dominant project management symbols (such as the iron triangle) reinforce the discordance between the 'lived experience' and the management approaches in the professional bodies of knowledge.

### 2.4. Boundary objects in project management (PM)

Boundary objects are an analytic concept used to describe an abstract or concrete object that meets the informational needs of various social worlds, and they are often visual in nature. Examples of boundary objects include sketches, virtual prototypes, machines and parts (Ewenstein & Whyte, 2009). Star and Griesemer (1989, p. 393) use the term "robust" to describe boundary objects, referring to their permanence. The term robust is discussed further below in relation to epistemic objects. The concept of boundary objects has often been used by scholars who are adopting a practice focus and have attempted to understand the mediatory role of particular objects in action (Whyte & Lobo, 2010).

Boundary objects have been examined in project work and have value in areas such as resolving conflict (Iorio & Taylor, 2014), facilitating collaboration (Barrett & Oborn, 2010), knowledge sharing (Di Marco, Alin, & Taylor, 2012; Whyte & Lobo, 2010), capturing lessons learned (Fuller et al., 2011), alignment-seeking (Beckett, 2015), supporting methodology use (Baskerville & Pries-Heje, 1999), and negotiation (Alin et al., 2013; Di Marco et al., 2012). Boundary objects have been proposed as providing a focal point to think with (Iorio & Taylor, 2014). However, critical perspectives recognise that boundary objects are not always

useful (Barrett & Oborn, 2010). Where teams are dispersed, their usage may be problematic (Sapsed & Salter, 2004). It has also been recognised that without real-time communication, the value of boundary objects can be diminished (Alin et al., 2013).

Whyte and colleagues (Ewenstein & Whyte, 2009; Whyte, 2008, p. 47) discuss epistemic objects and bring a nuance to the discourse on boundary objects, particularly in terms of visuals. In a conceptual study, Whyte (2008, p. 47) highlights that when visuals are used in project work, they are commonly not fixed or stable (recall here Star and Griesemer's (1989) term robust), as might be expected of boundary objects. Rather, they are in a state of flux and changing as dialogue unfolds. As an example, Ewenstein and Whyte (2009) found that the practice associated with visuals in an architectural firm suggested they were more than boundary objects, and could be classified as epistemic objects, in that the boundary objects under study changed over time. Their findings indicate these visual objects fulfil an agential role, prompting questions and discussion. Through conversations supported by these objects, there is an evolution of knowledge related to the activity undertaken.

A similar perspective is proposed by Papadimitriou and Pellegrin (2007) who discuss Intermediary Objects of Design (IODs). They argue that objects such as designs and prototypes are interim tangible objects, which are representative of the eventual deliverables. They align IODs with boundary objects in terms of supporting communication amongst stakeholders, but highlight their role as temporary representations. Also related to visuals epistemic qualities, Comi and Whyte (2018) find that visual artefacts support 'future making' through their performativity in imagining, testing, stabilising and reifying a development strategy for a public garden in the United Kingdom. Their findings indicate that the materiality of visuals is useful in bringing an imagined future into the now (Comi & Whyte, 2018).

## 2.5. Summary of literature review and derivation of research question

A key project managing activity is engagement with executive stakeholders. Given the visual turn in society more broadly, and its argued significance in organisational life, the literature suggests that there is value in exploring the conditions that influence project managers' use of visuals to effectively engage with executives. From a practice perspective, we see the deepest exploration of visuals in project work in the discussion of boundary objects and epistemic objects. Primarily, studies have sought to understand the role of visuals and/or boundary objects in project practice, often through case studies. The effectiveness of visuals and/or boundary objects in sensemaking activities is inconclusive. Therefore, this study seeks to contribute to this ongoing exploration by focussing on the conditions that influence the use of visuals by project managers to engage effectively with executive stakeholders. The study's research question is:

*What are the conditions that influence the effective use of visuals by project managers to engage executive stakeholders in project work, and what are the relationships between these conditions?*

## 3. Methodology

This study is situated within a critical realism paradigm. Critical realism is situated between positivism and interpretivism (Rutzou, 2018) and Vincent and O'Mahoney (2018) characterise it as aligning with ontological realism and epistemological relativism. According to critical realism, we interpret the world that exists independently of us and our conceptions are not necessarily accurate (Mingers, 2015); there is fallibility in our knowing (Roberts, 2014). Critical realism embraces complexity and is a paradigm associated with explaining outcomes and understanding phenomena (Clark, 2008; Houston, 2014). However, unlike positivism, it is not seeking the simplistic certainty associated with methods such as regression analysis, but rather to explore why different contexts may result in different outcomes (Vincent & O'Mahoney, 2018). Critical realism has been argued as being particularly useful for exploring

practical knowledge (Mingers, 2015), and as such is appropriate for this study with its practice-focused objectives. For this study, critical realism enables us to conceptualise that an activity exists called project work and that visuals are a device within this activity. However, the participants' experience and perceptions of project work and the use of visuals will vary.

### 3.1. Data collection method (including participant recruitment)

The empirical data for this exploratory study is a series of one-to-one semi-structured interviews with two sets of participant groups. There are interviews with eleven project managers, and interviews with thirteen executives who had responsibilities as board members or sponsors in project work. Participating project managers and executives were not recruited as pairs. Each interviewee had a single audio-recorded semi-structured interview (average length: 30 min). Half of the interviews were conducted in-person and half via video conference.

Qualitative research methods align with the critical realism paradigm (Roberts, 2014). Specifically, qualitative methods are useful in building an understanding of the context of a phenomenon, including influential elements at play, while also recognising the subjectivity of knowing (Butler-Kisber, 2018; Ograjensek, 2016, ch 22; Roulston & Choi, 2018). The interview proforma in this study aligns with an episodic approach, in that episodic interviewing seeks to ground the interview in the participant's actual experiences by asking them to recall specific events or experiences (Flick, 2000).

Following ethics approvals, recruitment commenced through contacts within the researcher's own networks (professional and previous research studies), from which followed a snowballing approach. All participants were based within Australia at the time of the interviews. The aim of the study was to develop a general understanding of the phenomenon of project managers using visuals with their executive stakeholders; as such, diversity in age, gender, experience, and sectors was sought when recruiting participants (refer Table 1). The focus of the project manager interviews was to understand their experience of visuals, such as whether they found them to be valuable and identifying the enablers and constraints relating to their use. Example questions included:

- Do you currently use visuals in your practice as a project manager? If so, please describe.
- Do you consider there are benefits in using visuals? Why/why not?
- Are there barriers to you using visuals in your work? If so, please describe.

The focus of the executives' interviews was on their experience in consuming visuals, such as what they found useful about them, and when they were not useful. Example questions included:

- Is there information you have to consume in your role as a project board member/sponsor that you find difficult/laborious to process? If so, please describe.
- Have there been any times when a project team has used a visual that has been useful? Please describe.
- Have there been any times when a project team has used a visual that has been not been useful? Please describe.

In addition, a variety of demographic and role questions were asked to both participant groups.

### 3.2. Data analysis method

NVivo was used to manage manual thematic analysis of the transcribed audio recordings from the interviews. Thematic analysis is a method to summarise and categorise research data in order to identify themes or patterns in data (Clarke & Braun, 2017; Given, 2008;

**Table 1**  
Participant demographic data.

Project manager demographics		
Demographic	Variable	Count
Gender	Female	4
	Male	7
Age	20–29	1
	30–39	4
	40–49	4
	50–59	2
	59+	0
Industry types	Construction, defence, education, financial services, government, information technology	
Sector	Private	4
	Public (Government and government-funded)	7
Years project management experience	1–5	0
	6–10	5
	11–15	3
	15+	3
Executive stakeholder demographics		
Demographic	Variable	Count
Gender	Female	7
	Male	6
Age	20–29	0
	30–39	3
	40–49	8
	50–59	2
	59+	0
Industry types	Digital technology, energy, financial services, information technology, human services	
Sector	Private	3
	Public (Government and government-funded)	10
Years in executive role	1–5	3
	6–10	8
	11–15	0
	15+	2

Lapadat, 2010). This study followed Braun and Clarke's (2006) protocol for thematic analysis. Thematic analysis is a flexible analysis method, but it is necessary to declare the research design decisions that have influenced the execution of the protocol (Braun & Clarke, 2012, ch 4). In this study, the data analysis does not simply 'give voice' to the experience of the interviewees, but rather considers the latent meanings in their interview responses. Inclusion of such latent meanings is an acceptable approach to data analysis within the thematic analysis framework (Braun & Clarke, 2006). Table 2 shows the execution of the analysis within the framework.

**Table 2**  
Application of thematic analysis to interview transcripts.

Thematic Analysis Protocol as per Braun and Clarke (2006)	Application to interview data
1. Familiarising yourself with your data	All interview recordings were transcribed and imported by the researcher into NVivo.
2. Generating initial codes	Researcher reviewed each transcript, seeking to understand what meaning/insight was being offered by each phrase. A total of one hundred and seventy-six codes were generated.
3. Searching for themes	The codes were grouped into themes. Each code was considered as to whether it was appropriate to include in an existing theme or required a new theme.
4. Reviewing themes	Codes and sample extracts of interviews in each theme were reviewed to ensure alignment with theme intent. Adjustments were made as required. The relationship and influence between the themes were explored in relation to the research question. The researcher commenced representation of themes in an influence diagram. In the influence diagram these themes are termed 'influencing conditions'.
5. Defining and naming themes (influencing conditions)	Descriptive name for each influencing condition is generated and proof quotations allocated to each condition. Revision of influence diagram performed as required.
6. Producing the report	Researcher finalised influence diagram and commenced writing scholarly article.

Systems thinking is integrated with the thematic analysis to assist in the development and representation of the findings. Systems thinking has established usage in the project management discourse. For example, it has been proposed as a device to support risk management (Yang & Yeh, 2014), stakeholder management (Elias, 2016), and more generally has been identified as a useful tool from which project managers would benefit (Sheffield, Sankaran, & Haslett, 2012). Influence diagrams can reveal the links between different influencing conditions (or variables) and also identify reinforcing or balancing loops (Senge, 2011) (these concepts are explored in Section 4.1). The term *influencing conditions* is used to describe the variables in the diagram that influence the use of visuals as an effective engagement device. The use of the term follows Ika and Donnelly (2017) who discuss success conditions for international development projects. The use of condition *categories* as adopted by Ika and Donnelly (2017) is used for grouping related influencing conditions. In Fig. 1 and Table 3 the conditions are shown in the syntax of 'actor: condition'. This nomenclature is used to enable the representation of the same 'actor' (for example, project manager, executive or the organisation) with multiple 'conditions' related to them.

There is a difference between process maps and influence diagrams. The former has a temporal element and shows a sequence; while the latter demonstrates how conditions influence one another (Senge, 2011). In an influence diagram, arrows between conditions indicate the influencing relationship between conditions. If there is a positive sign at the arrowhead, it indicates a proportional relationship between conditions. As one condition increases, so does the other. A minus sign at the arrowhead indicates an inversely proportional relationship between conditions. As one condition increases, so the other decreases.

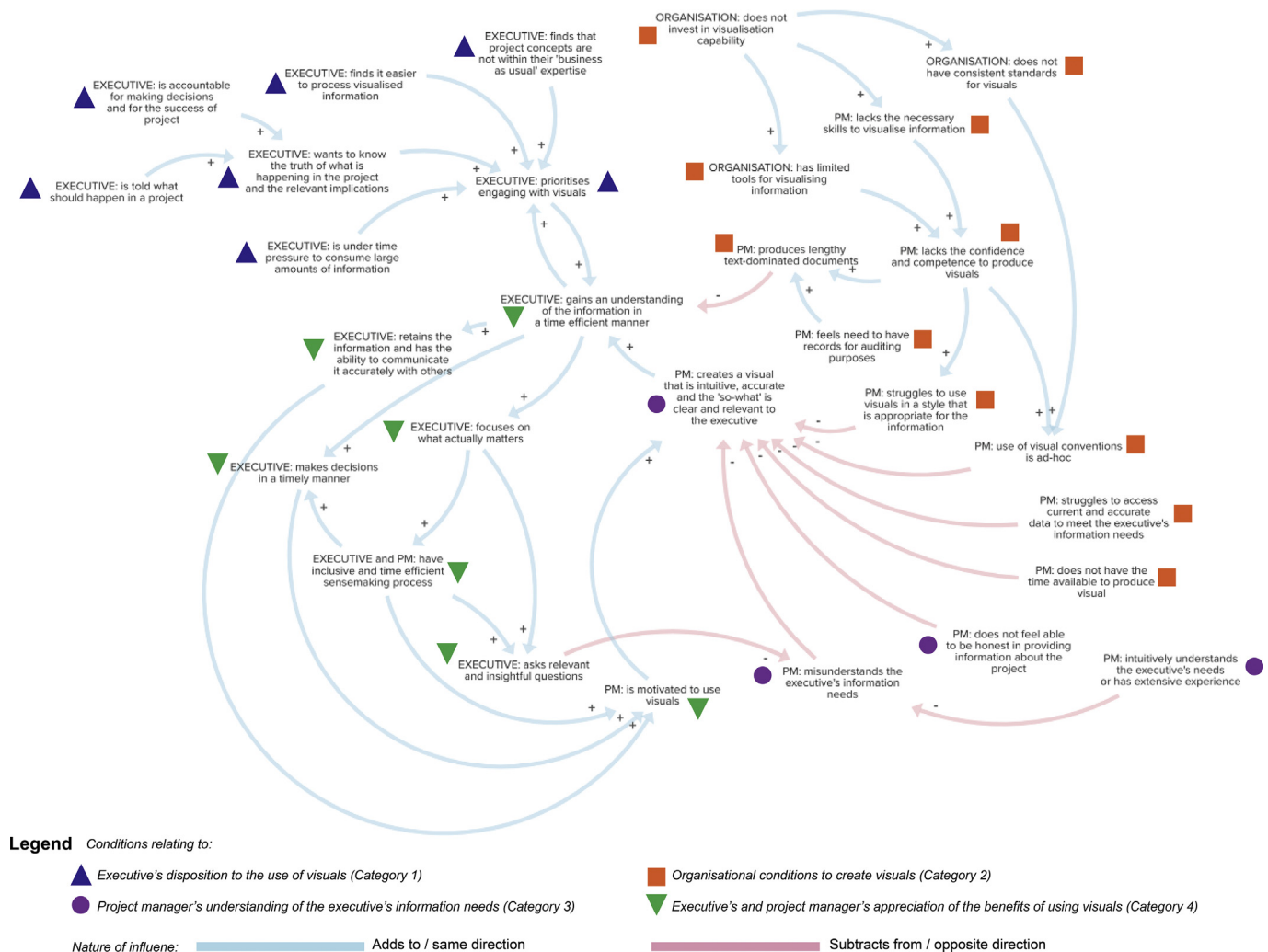
Critical realism helps to explain outcomes with an appreciation of the complexity of how influence unfolds within a system (Vincent & O'Mahoney, 2018). Therefore, an influence diagram is particularly useful in answering this study's research question. Shaw and Wainwright (2013) have used a similar approach to portray their findings relating to success factors associated with project collaboration.

In terms of the methodological validity of the data collection and analysis methods, qualitative research is associated with different measures of validity than quantitative research (Madill, Jordan, & Shirley, 2000). A quantitative approach may suggest there is some objective truth to be found in the data. A qualitative approach appreciates that all coding is subjective and a single researcher's thematic analysis process is not more or less valid than another (as long as their process and design choices are disclosed), while acknowledging that code choice and theme identification may be more or less persuasive (Braun & Clarke, 2013; Vaismoradi, Turunen, & Bondas, 2013).

#### 4. Results

The results are presented in two parts. First, the influence diagram (refer Fig. 1) is introduced, which is derived from the thematic analysis.





**Fig. 1.** Influence diagram: conditions that influence the use of visuals to be an effective engagement device between project managers and their executive stakeholders.

Table 3 explains each influencing condition and gives example quotes. Second, the influencing conditions are examined according to the category with which they have been associated (refer coloured shapes on Fig. 1).

#### 4.1. The conditions influencing the use of visuals with executives

As introduced in Section 3.2, influence diagrams model the interrelationship between influencing conditions in a system. Fig. 1 is an influence diagram that illustrates the relationships between the conditions (black text) that influence the project managers' use of visuals to effectively engage executives. Blue arrows with a positive sign close to the dependent condition show proportional relationships between the conditions. Red arrows with a negative sign close to the dependent condition shows an inversely proportional relationship between the conditions. Table 3 provides supporting quotes from the interview data for each condition.

The influence diagram shows the interrelationships between the conditions that influence the use of visual; however, this 'universalised' model has limitations. Primarily, the organisational conditions to create visuals (category 2) and the project manager's understanding of the executive's information needs (category 3) is variable across the data set. As such, in Fig. 1 the conditions reflect a situation in which a project

manager is somewhat lacking in their capability to produce visuals. For example, they might be receiving limited support from their organisation in terms of tools and training, struggling to access information, or have limited time to develop visuals et cetera. Due to the nature of the data set, i.e., the interviewed project managers were not necessarily associated with the interviewed executive stakeholders, it is not possible to provide a specific influence diagram that models the entire 'system' with organisational, executive, and project manager conditions. The choice to show the conditions on the right-hand side in their hindered state is justified, as there was only one instance in the sample where an executive stakeholder indicated that they felt many of the conditions on the right-hand side were supporting the production of effective visuals in their organisation. The large majority of interviewed project managers experienced challenges in producing visuals. This influence diagram reveals how even though many project managers were motivated to use visuals (refer the reinforcing loop associated with category 4 conditions, for example Fig. 2), there were hindrances that were 'balancing' this motivation (refer category 2 and 3 conditions and as an example Fig. 3).

A key feature of influence diagrams is the visibility of relationships such as reinforcing and balancing loops (refer Fig. 2 and 3). Reinforcing loops indicate when the series of conditions will result in the snowballing or growth of a situation (for example, growing prominence of the use of visuals). By contrast, a balancing loop will moderate or dampen the

**Table 3**

Description and support quotes for each condition in the influence diagram.

Influencing conditions	Description	Supporting quotes
<b>Category 1: Executive's disposition to the use of visuals</b>		
EXECUTIVE: finds that project concepts are not within their 'business as usual' expertise	The executive may be participating in a project for which they do not have operational knowledge and/or understanding of project management methodology. Concepts need to be explained simply.	So I'm not an ICT technical guru or anything, but I'm in the land of ICT. So I think when you're in an executive position, whether it's in ICT or not, you need to have that translation. So the visual element, the story, the allegories help [people to understand]. [EX11] Some of the ones I do get to reuse are things like discussing governance, what is government and the concept of delegated responsibility. Not everybody gets that. [PM10]
EXECUTIVE: is under time pressure to consume large amounts of information	Executives exist in a world of information overload and are trying to process information as rapidly as possible.	Execs are time-poor. If we can get the essence of something from looking at a page or looking at a diagram, we'll distil the essence and then we'll speed read the rest of the document, if there is one, to get the main points out of it. So that we can do our job. [EX07] Where basically instead of just deferring [reading the email], [I'll] hit the reply button, "I'm sorry guys, too long, give me the CliffsNotes please". I think that's a product of having managed technical people for a long time as well. Like you get some of them that write these big essays ... And you go, "CliffsNotes please". It's a little bit cheeky but I think it really does give that message saying, "I do want to understand this, but give it to me in a form that I can synthesize more quickly." [EX09]
EXECUTIVE: finds it easier to process visualised information	Executives prefer to engage with visual artefacts rather than lengthy text documents.	So in my experience, different people learn differently; people understand things in different ways. But everybody understands pictures. But only some people have the time or inclination to go through detailed narrative in an email or in a board paper. [EX05] I think nobody has time for text. It's just not something people can consume any more. And I think it's because of the volume of information we're trying to deal with. Almost daily, I can see text disappearing. [PM06]
EXECUTIVE: is accountable for making decisions and for the success of project	Executives are responsible for delivering the project and need to make decisions that are beyond the tolerances of the project manager.	And what are they expecting [from] me, that they'd like me to escalate things or provide support in terms of getting them resource commitment from say operational resources or those sorts of things. [EX09] It helps people understand things they wouldn't otherwise understand. That's always the goal of a visual: to aid comprehension and, in some cases, to help decision making. [PM11]
EXECUTIVE: is told what should happen in a project	The type of information the executive is seeking is shaped by their training and general hearsay about what they should be concerned about in projects.	There's a jumping all over the place, but in reality project boards really only care about time, cost and quality. [EX01] And you know we always talk about schedule, quality and cost on projects ... [EX02]
EXECUTIVE: wants to know the truth of what is happening in the project and the relevant implications	Executive wants to be able to see what is happening and may happen in the project. To be informed about the pertinent items.	So you had where they were up to, what was happening next and what the risks were ... So again, it was around just making it real for you as a decision maker. [EX11] I'd rather they fessed up and said it wasn't going to happen. Because as a sponsor you're in a position where, likely [you'll need to ask] for more money or time or still make it happen without money. [EX02]
EXECUTIVE: prioritises engaging with visuals	Faced with a text-heavy document or visual the executive is more likely to engage with the visual.	Well, it's just because you avoid the one hundred pages. When am I going to have time to read that? And it ends up being, because the time you do have to read something like that is when you're at home on the couch. Like, it's that kind of stuff where you go, "well I'm not going to get a chance to do that in the office, I'll take that home". And so [I end up] getting a bit cranky with it. [EX13] I probably won't look at the twenty-page document. I just don't have time during the day to do that. The one page of the visual, absolutely, I will have a quick scan of that; but the twenty pager, even if it was on a Friday and I had time to read it on the weekend, I probably wouldn't. [EX12]
<b>Category 2: Organisational conditions to create visuals</b>		
ORGANISATION: does not invest in visualisation capability	The organisation does not provide visualisation support to project managers through available technology, training and agreed visual standards.	We're just expecting them to be able to use Visio or whatever or PowerPoint. [EX12] The [organization] provides zero formal project management training, so we're just kind of expected to learn how to use all these tools. I'm just a self taught, MS Project practitioner. And so I think it's my lack of training. [PM03]
ORGANISATION: has limited tools for visualising information	Project manager has limited access to visualisation software. Generally, they make do with MS Office products.	Visio and PowerPoint. Mostly, probably more Visio. [PM07] I would normally only use PowerPoint or I would use program called Inkscape. [PM11]
PM: lacks the necessary skills to visualise information	The project manager is not confident in being able to tell stories in a visual format.	I do struggle to be able to produce high quality visuals to convey what I mean sometimes. So that frustrates me and them. [PM03] Look [visualising is] just not their core skill set. [EX02]
ORGANISATION: does not have consistent standards for visuals	The organisation does not have a standard set of visuals or consistent visual language.	And I guess we don't have as many standardized ways of them ... Gantt charts: we've all become very used to consuming them and how to read one of them. Whereas we're probably still at a stage where it's very ad hoc with that more human stuff and you're kind of like "well, how am I meant to read this one." [EX01]

(continued on next page)

Table 3 (continued)

PM: lacks the confidence and competence to produce visuals	There is a deficit in the project manager's confidence and skill to produce effective visuals.	I want consistency in every board meeting. So that we start to just get used to the approach. And then we can quickly pick-up if where the exceptions really are. [EX03] I think in general they're not, they're not good at it. Like the PMBOKs and the PRINCE2s and DSDMs and stuff like that, none of the methodologies or bodies of knowledge teach that visualisation. That seems to be something that is in the realm of graphic designers or artists, not project management. [EX05] Probably I need to be more proficient. I would like to enhance my use of visual products to deliver the right message and I find I take a long time. And that I could rectify that by doing a training course. [PM08] I guess it's just the really dense documentation [laughs]. So in the PRINCE2 frame, you know there are the PIDS, the initiation documents. So a couple of the projects that I've chaired, like it's been a hundred pages, because they're multi [organisation]. They were finance or payroll upgrades, so they're complex projects and to capture everything it's quite chunky. [EX13] You don't want to have to sit there and go "okay it's my sixth project meeting today, what are you looking for me to do?" You shouldn't need to sort of wade through this big document to actually get to that. [EX09] People get a little bit concerned of auditors coming in after the fact ... And so people may, particularly project managers, will say look, for my own assurance I want to do things in a bit more detail so that I can evidence why we've done certain things particularly after the fact. [EX13] Not to try to have to guess from this big risk register, going well, "is this just arse covering? Or are you trying to elicit my support on something?" [EX09] And one of them was, it was about one hundred pages and they had sort of basically, cut and pasted almost the whole risk register. And it's just nuts, it was for a board, it was like they'd pitched it entirely incorrectly. And it was also a bit disorganized, so it was hard to navigate through, and they tried and attempted it like a dashboard from the summary page but it just didn't really hit the mark and was again harder to read. Confusing. [EX10] So I did have a project manager who bought me a beautiful, they spent a long time on producing pie graphs, which was really colourful because they knew I liked colour and liked representation, visuals. But they really just missed the mark. Like it didn't tell me anything. It didn't tell me progress, the actual data. Oh my God it was just crazy shit. [EX12]
PM: produces lengthy text-dominated documents	The project manager resorts to using lengthy text documents.	
PM: feels need to have records for auditing purposes	Project manager has a tendency to produce lengthier documentation for compliance or auditing purposes.	
PM: struggles to use visuals in a style that is appropriate for the information	Project manager struggles to present the information in a way that is appropriate for the executive and the type and their preferred level of information.	
PM: use of visual conventions is ad-hoc	If the use of visual conventions is inconsistent the value of the visual is hindered.	The best project managers that I find from that perspective are the ones who give you something consistent and visual. [EX08] [In reference to a good visual]: And it was consistent. And that's where I see the value of a PMO – in education. [EX03] Historically, we haven't had large volume projects. So at the moment we've got very immature processes around project reporting and we're having to pave the way and develop that. [EX04] Everything is underpinned by someone's assumptions or their own assessment of the situation. And that's skewed by someone's background, their knowledge, their abilities. [EX06] I guess the next thing is sometimes it takes a lot of effort to make something long and complex, simple. It's very easy to make a colourful chart that has all the wiz-bang popping shading and fonts but that doesn't necessarily mean it is going to get the job done. So balancing the time with the effectiveness I think is always a challenge. It's always easy to put in more time than you need to make it look pretty. [PM10] Sometimes it's a time factor too, you know. You just keep doing what you're doing [not producing visuals] because of time [pressures]. [PM06]
PM: struggles to access current and accurate data to meet the executive's information needs	Project manager has difficulty getting the data to create an effective visual.	
PM: does not have the time available to produce visual	Project manager lacks the time available to develop the visual due to focussing on other project management tasks.	
<b>Category 3: Project manager's understanding of the executive's information needs</b>		
PM: intuitively understands the executive's needs or has extensive experience	Experienced project managers bring an intuition about the right level and type of information to meet an executive's needs.	I think it depended on the nature of the PM, their background and sort of where they've come from. So to generalise, probably, I think you find more of those PMs that specialise in digital user experience, online projects, are a lot more au fait with it and probably some of the other PMs who are more the senior program type ones. PMs that work on technical projects are a lot less visual. [EX01] That's right. And I think some PMs go too far with the "here's every line in my Gantt chart". [EX08] I think it's a difficult task, and that comes down to the relationship of the project manager to the board, and trust is key I think. [EX06] And training people to be honest is a difficult thing. [EX02] It's just like if I can't be discerning enough to give people what they should have, then I'll just give them everything. You know what I mean? But is it pertinent? Ooh, if I can't make that decision well geez,
PM: does not feel able to be honest in providing information about the project	The project manager does not feels they can be honest in the information they supply to the executives.	
PM: misunderstands the executive's information needs	The project manager does not understand the type of information and level of information that the executive requires to	

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Table 3 (continued)

	see the relevant 'so-what'. Superfluous information may be provided.	"here you go, you get everything". And it'll be the smallest font I could possibly get in a PowerPoint. [EX06] And just getting that real litmus tests on that. And if you're not really seeing those basic key essentials really popping out at you, you have to wade through, actuals vs. variations, commitments, and it's this big long bucket list of stuff you're going well, "what is this trying to tell me?" [EX09] So where I've really loved it before has been PowerPoint presentations of statuses. So it has just been a couple of screens and it just said: This is the progress, this is where we're at, these are the challenges. Very colourful, very visual. [EX12] And the fundamentals ... so if you see it on a page, you know that it's covering off the key elements or key information that will enable the person on the board to be able to know whether it's on the wrong track or it's not and what are the next steps and what are we doing about that? [EX04]
PM: creates a visual that is intuitive, accurate and the 'so-what' is clear and relevant to the executive	The project manager creates a visual that provides the information in a manner that makes the meaning clear.	
<b>Category 4: Executive's and project manager's appreciation of the benefits of using visuals</b>		
PM: is motivated to use visuals	Project manager finds value in using visuals and is encouraged to use them in future engagement.	I'm a visual learner myself, and being an ex-teacher, I know the value in using them. [PM10] I find using [visuals] is essential. [PM03]
EXECUTIVE: gains an understanding of the information in a time efficient manner	The executive has been able to understand the provided information in a timely manner and feels informed to take any necessary action.	But yeah, getting something like that; it's a thing in order to be able to synthesize information so very quickly ... So I'm walking out of there, I have got all my queries across and answered, I suppose. I'm making the most of my time. [EX04] But the visuals are, I find them quite powerful and fast, simple to read and an executive really should be looking at a report by exception. [EX08]
EXECUTIVE: retains the information and has the ability to communicate it accurately with others	The visual helps the executive remember the information and pass it on.	So whether I've got the prop [visual], or don't have the prop, to me the image is embedded [in my mind], and then I can use that to explain. I'm probably someone who likes to understand as opposed to just get the information if you like. [EX08] And it was interesting watching them use it because our [stakeholder role] chairs that meeting, so we've got to kind of prep him. Here's what we think will work. And he just pulled out the [visual] and just talked to that. [EX13]
EXECUTIVE: focuses on what actually matters	The executive focuses on the areas of the project relevant to their role.	But the high level visual summaries, can, when you've got someone who's got the attention span of a gnat, they've got about 10 min of time to talk to you and you want to make it as precious as possible and having a visual representation can give you that ability to get that message, whatever it is, across. [PM01] Well it's time efficient. Like the more quality information I could absorb faster, tells me how involved and what I need to do. [EX06] [In regards to the benefits of visuals]: So I think it's that ability to support fast turnaround decisions. [EX09]
EXECUTIVE: makes decisions in a timely manner	The executive makes decisions, takes action and/or provides advice in a timely manner.	
EXECUTIVE and PM: have inclusive and time efficient sensemaking process	Executives and project manager are able to discuss in a meaningful way the important issues.	I take a whiteboard into the meeting room, throw it down on the table with a bunch of markers, and as people are brain dumping the concepts onto the whiteboard we end up talking about the same things in the same way. Simply by pointing. So it starts to really clarify and help reduce misunderstanding of things. [PM10] I think for me when people are time-poor and you want to be absolutely focused on the project at hand, you want to see visually, quickly, where do I need to focus my attention? And those visuals provide that, because then you can get into, okay, well those particular ones give you the detail on those, you don't hold down into to all of the detail of the project. [EX12] If it's just, "hey I want to know how a projects going", I just want the weekly status update, when in reality I probably want the bulk of the status update to be visual, that I can quickly glance at, and get an understanding and now I can go and ask specific questions if I want more information. [EX01] Because then you can drill down when you need to. So, this is flagging me to go and ask questions about this, that, or I might want to see the detailed project report. [EX04]
EXECUTIVE: asks relevant and insightful questions	The visual triggers questions that are relevant and appropriate.	

situation (for example, limit the number of visuals created). Fig. 1 has multiple reinforcing 'loops'. Fig. 2 is an example, where a project manager is motivated to use visuals based on the benefits they perceive. However, in many cases there are balancing loops related to capability limitations. For example, Fig. 3 shows that time limitations can have a negative effect on the project manager's ability to create visuals. Review of Fig. 1 (on the right-hand side) shows the many influencing conditions that could form a similar balancing loop that would limit the creation of visuals for effective engagement.

#### 4.2. Exploration of the influencing conditions

The twenty-nine influencing conditions shown in Fig. 1 and Table 3 are examined according to the four categories.

##### 4.2.1. Category 1: Executive's disposition to the use of visuals

The first category of influencing conditions relates to executives and their environment. All interviewed executives appreciated visualised information and suggested that they commonly prioritised this type of



information. Some executives provided the caveat that even if the visual is of bad quality, unless it was misleading, it was preferred to lengthy text.

My general view is it is better visualised than not, even if it is a bad visual. Unless it is actually misleading or tells a different story. [EX05].

When asked why visuals are often a prioritised communication medium, there was a similarity in the participants' responses. Executives explained how they wanted an understanding of what was happening in the project. However, they consistently described being time-poor and in a situation of information overload, which means they need to consume information very quickly to make decisions.

So, I want to be able to quickly consume the information, look at it, look through a pack, get the general gist and feel, and understanding, and quickly get an understanding ... you really just want to be able to quickly consume, get an understanding ... [EX01].

Faced with a text-heavy document, both EX12 and EX13 stated that they were unlikely to get the chance to read the document in a timely manner.

There was also a consistency in the executives associating themselves as being visual people or visual learners or understanding concepts better with the use of visuals.

Part of it is because of the way my brain works. It's because I like to see that bigger picture. So I think that's the easiest way of getting that is through some kind of visual. [EX11].

Within their responses, there was an indication that project management norms influence what they want to know. For example, deviation of the project work from the agreed plans.

And by that, I mean where it is tracking in conjunction with what was originally set out from a business case perspective. In addition to that ... a clear understanding of the costs incurred to date versus those budgeted or re-forecasted, whatever the comparison is to. [EX04].

PM09 explained how his executive stakeholders failed to recognise the importance of team dynamics and focussed more on traditional success measures. There was also evidence that executives often participate in projects that may not fall within their domain expertise, and that visuals

are a more effective way for them to understand unfamiliar concepts.

And often you're talking to stakeholders who tend to be, because they're less experienced in the sector, you need to bring things down into very simplistic [terms], so they understand what it is. So we draw a lot of pictures and diagrams and sketches to allow them to simulate what we're actually doing. [PM05].

To summarise the conditions in category 1, the interviewed executives reported a preference for visualised information. This preference is attributed to a variety of conditions, including the executives being time-poor. Project management norms also shape their information preferences.

#### 4.2.2. Category 2: organisational conditions to create visuals

As shown on the top right-hand side of Fig. 1, a variety of conditions were identified which influence the capability to create of visuals. The term capability aligns this discussion with the SyLLK Model that profiles capabilities in project organisations (see, for example, Duffield (2016); Duffield and Whitty (2016)). This model conceptualises organisations as a network of systems, where facilitators in these systems need to be aligned for a capability to be realised (Duffield & Whitty, 2016). An individual's skill at performing a task is a feature of just one of the six SyLLK systems, called learning.

The project managers' capability to create visuals is variable, and is the result of both personal skill and the availability of supporting organisational conditions, such as tools and standards. Variability in skill was evident in both the interviewed project managers' self-assessments and in the executive stakeholders' reflections.

[When asked about project managers' skills to develop visuals]: It was varied, it wasn't consistent by any means. I think it depended on the nature of the PM, their background and sort of where they'd come from. [EX01].

I'm in a quandary sometimes on how to communicate the volume, the complexity, the relationships [in visuals], in a way that is easily consumed and understood without trivializing it. [PM06].

Aside from personal skill or experience barriers, capability is hindered for a number of other reasons. For example, where there is a reported lack of organisations making tools available to create visuals from data and an absence of training to assist project managers in learning how to use these tools.

Because they've been constrained by the tool that they're using. And to me, I think that's one of the bigger challenges that project and program managers face: the quality of the tooling that they're given. [EX09].

Some project managers were satisfied with their visualisation tool-set, but overall this is perceived as a hindrance to creating visuals.

Having the available time to produce the visuals is also reported as an influencing condition. Both project managers and executive stakeholders recognised that developing and keeping visuals current was time consuming, and this was a common barrier to their creation.

I find finding the time to sit-down, focus with a number of competing priorities difficult. I've come into a project that's in-flight, not tracking to a lot of the key deliverables, and trying to get those out, getting time to sit there, and think about how you're going to present it, what's the best way? [PM08].

So for me the other really big issue around visuals in project work is that a project can go for a very long time. And you want your project manager to spend the time on managing that project. And so the visuals need to be repeatable and simple so that they're not spending their time making the visuals work. [EX11].

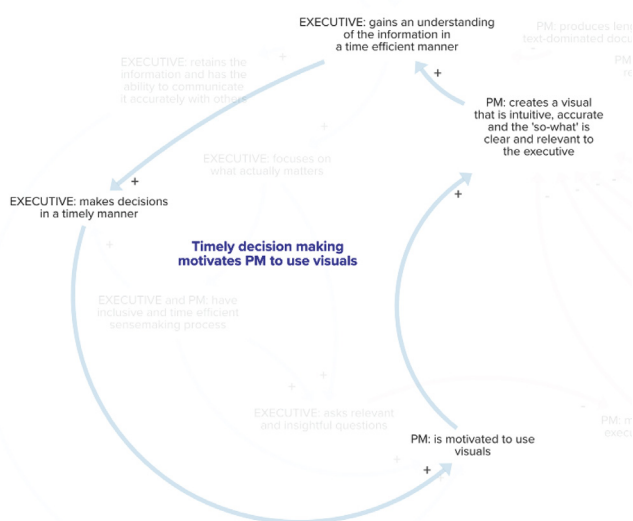


Fig. 2. Project manager is motivated to use visuals (example of reinforcing loop).

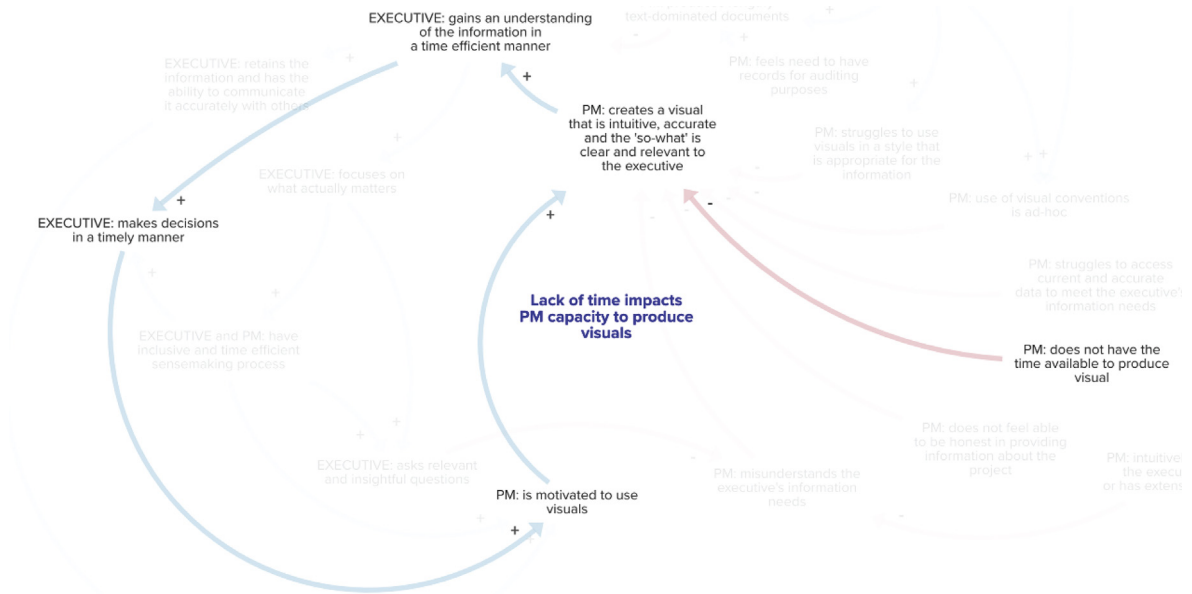


Fig. 3. Project manager is limited in their capacity to produce visuals (example of balancing loop).

Related to this absence of time was the additional requirement to compile lengthier text-based document in order to ensure auditing or compliance obligations were met, or as the precursor to developing the visual.

So, of course, you do the project management plan for auditing purposes and almost for yourself ... [PM01].

Another influencing condition was the ability to access current and accurate data to use to create the visual.

Again, the currency is a challenge and it's the old ... "here's the report as at end of September, and we're now late October", and everyone's looking at it going, "it's a bit out of date isn't it?" So I think that's a problem as well as far at the timing because people want the latest information. [EX08].

This condition highlights that the production of a visual is a complex network of personal skill and organisational conditions.

#### 4.2.3. Category 3: project manager's understanding of the executive's information needs

Executives report that for visuals to be an effective engagement device, project managers need to understand their information needs and stylistic preferences. These preferences were not identical across the interviewed executives, but there were a variety of preferences expressed that were consistent across the majority of executives. For example, consistency in visuals across time and projects is important to enable quick identification of exceptions requiring attention.

But if I could get all board packs or all information in the same format, in the same process, the same visuals, same every time, then my ability to evaluate and to either understand what I'm being asked to make a decision on, or to understand questions I want to ask, is greatly increased. [EX06].

Compliance to visual norms or syntax, such as the use of red-amber-green status indicators, also influenced the perceived efficiency of the visual.

Green was good, orange, red and then purple was the next colour, and apparently purple was like extreme. You look at it and go, "purple

what's that mean?" You go "red means bad, purple means even worse than red? (puzzled expression on face)" [EX01].

An executive's assessment of effectiveness is influenced by whether the 'right level' and 'right type' of information is provided. Executives want to quickly discern the 'so-what' in a given visual.

Yes, it's about summarising it up so that you can see it brought up a level. Abstracted a level up. You don't need all the detail on there, you just need, sort of almost like the elevator pitch. What are the really key pertinent points of this thing? [EX07].

So, I felt it's really important to make sure that we distilled that down to the things that really count. How are you looking from a commitments point of view? How are we looking from overall spend? How does that compare to your schedule completeness? And just getting that real litmus tests on that. And if you're not really seeing those basic key essentials really popping out at you, you have to wade through, actuals vs. variations, commitments, and it's this big long bucket list of stuff you're going well, "what is this trying to tell me?" [EX09].

Related to this ability to pitch the 'right level' and 'right type' of information some executives specifically addressed the need for the project management profession to evolve and adapt and expressed the idea that project management practice lacked innovation:

But I think the practice needs to shift more than anything else. [EX06].

There's probably a lack of innovation in that area in terms of project management practice. Like they're still in my experience, which is limited to [my experience], but still a lot of PMs are fundamentally doing it the same way as they probably did 10 years ago ... You know fundamentally we're still wandering around with the same sort of PRINCE2 templates we used fifteen years ago. [EX09].

The executives found that more experienced project managers were better able to discern the right level of information and the right format than less experienced practitioners were.

... when you get a very, what I would say not inexperienced, but sort of middle level experience type project manager. It's almost like they try to show their talent off by creating the biggest list possible. So it's like I'm so good, I've captured everything. Whereas [when] you get a real senior one, they're so good that they capture the pertinent things. [EX06].

And I think she [a more experienced project manager] did them in Visio, were quite clear and powerful and she always kept them to a page. Albeit perhaps A3 at times. But you know they were very easy to follow. [EX08].

Truthfulness and honesty is also of great importance to the executives, who suggest this is not always an easy thing to get.

I think the challenge around that is the honesty in reporting. [EX08].

And training people to be honest is a difficult thing. [EX02].

I'm expecting to see the truth. [EX12].

Conditions in Category 3 draw attention to the need for visuals to meet the information needs of the executive audience. The influencing conditions in this category couple with the capability to create visuals (category 2) to result in a visual that benefits both the executive and the project manager.

#### 4.2.4. Category 4: Executive's and project manager's appreciation of the benefits of using visuals

Project managers and the executives discussed the advantages of using visuals. The influence diagram highlights how these conditions relate in a reinforcing loop. For example, executives reported that using visuals focuses attention on what information is actually relevant, and this increases the speed at which information can be absorbed and understood. This assumes that the 'so-what' message has been made clear in the visual, as per the conditions in Category 3.

If they don't have it [the visual], I find that they get too caught up on the architecture ... they get too caught up in the technical component as opposed to the business outcomes and what we want. [PM08].

Well, it's time efficient. Like, the more quality information I could absorb faster, tells me how involved I need to be and what I need to do. [EX06].

When the 'so-what' is clear, this results in more inclusive and time-efficient sensemaking and prompts the executive to raise relevant questions.

As soon as we have to wade through fifteen pages of text, our interest levels go down. We are distracted with a thousand other things ... And I think when you present the visual, a lot of the conversation that goes with it is targeted on the right questions. Rather than almost arguing about why did you write a sentence this way. So, it becomes more about the concepts and why particular things are given prominence, as opposed to the semantics. [EX07].

Because then you can drill down when you need to. So this is flagging me to go and ask questions about this, that ... or I might want to see the detailed project report. But just that overview, so I can know it's all ticking boxes or I need to go have a look at something. [EX04].

In addition to raising attention to the most pertinent factors, visuals can be consumed quickly and therefore executives are enabled to make faster decisions.

They [executives] want the ability to make decisions quickly. So, I think the power in the visuals is that it can help lead them to a swift conclusion in terms of them synthesising what they're seeing and then being able to act on that information ... [EX09].

Visuals also assist in the memorability of information and support executives' ability to communicate this information to others.

For me, it's [the] speed and lasting memory of: "remember the graph that was fifty percent full, or the bucket that was almost to the top overflowing". [EX10].

And it was interesting watching them use it because our [senior executive stakeholder] chairs that meeting, so we kind of prep him. Here's what we think will work. And he just pulled out the [name of visual] and just talked to that. [EX13].

Project managers reported that there is great value in using visuals to engage executives, which further motivates their use.

I think at times a one-page visual, like an A3 PowerPoint with before, after, and how we get there, and people, process and technology in a pictorial form, can do what a project management plan can in many regards. Only because the person will read that, as opposed to the sixty-page project management plan. They won't read [it]. [PM01].

I like visuals because they appeal, not to be disparaging, to the lowest common denominator in terms of rapid assimilation. I think you can also include more dimensions than you can do in narrative form or even verbally. And so, for instance, consider I have a bubble chart of a project portfolio. You can have size representing the budget, the colour representing health, the x axis representing risk and y axis representing benefits or reward, and maybe a z axis representing something else. [EX05].

Project managers' responses to the question 'do you think there is any value using visuals as part of your project communications?' included:

"Oh, definitely" [PM01]

"Oh, absolutely" [PM04]

"Yes, so it's because the picture tells a thousand words" [PM07]

"Oh, absolutely. Of course there is!" [PM08]

"Yeah, absolutely one hundred per cent." [PM10].

## 5. Discussion

Sections 5.1 through 5.3 discuss the theoretical and methodological contributions of the results. Sections 5.4 and 5.5 discuss the practical contributions. Section 5.6 outlines the limitations of these contributions along with future research opportunities.

### 5.1. Theoretical contribution: further validation of extant literature

The study's results confirm various assertions related to the use of visuals in project work. For example, simulations with students found that visuals could enhance portfolio decision-making (Gerald & Arlt, 2015; Killen, 2013, 2017). Studies in practice settings have also found visuals are useful in facilitating interactions and/or decision-making (Ewenstein & Whyte, 2009; Killen & Kjaer, 2012; Yakura, 2002). This study has added to the validity of these findings as the opinions of executives responsible for decision-making across different types of projects from a diverse range of organisations found that an assortment of visuals is useful for their decision-making activities. Additionally, the executive participants in this study confirm the importance of Gerald and Arlt's (2015) design principles of purpose, truth and efficiency for visuals to be effective. The study's results confirm the conceptual argument of van der Hoorn and Whitty (2015) that dominant project management dogma influences the expectations of those involved with projects regarding how the work should unfold. To summarise, this study

has increased the legitimacy of existing claims by drawing on the experience of those actively involved in project work in a variety of organisations and sectors, and this has implications for the credibility of this knowledge.

The study also confirms Whyte's (2008) observation that visuals in project work commonly lack the stability that Star and Griesemer (1989) associated with boundary objects. Visuals were presented by participants as being a boundary object in terms of being a mediator and focal point for building a shared understanding between project managers and executives (i.e. category 4). However, many of the visuals referenced by the participants (for example, timelines, visualised dashboards) changed over time. Similarly, visualised planning documents were presented as works in progress, from which input would be received and the visual updated to reflect this collective sensemaking. This dynamic or changing nature of the visuals points towards them being epistemic objects rather than boundary objects. This has implications for future research as it prompts researchers to consider framing visuals as epistemic objects rather than boundary objects.

### 5.2. Theoretical contribution: extending the literature

Importantly, the study's results also extend our understanding of the use of visuals in project work, specifically in terms of effective executive engagement. The influence diagram based on the participants' narratives, shows a 'bigger picture' (than previous literature) of the conditions involved in engagement using visuals, and how they relate to each other. Extant literature (as discussed in Section 5.1) has proposed some of the influencing conditions resulting from this study. However, this study has identified additional conditions that influence the use of visuals and provided elaboration on some of the previously noted conditions. These new and elaborated conditions relate to executives and the lack of organisational support for project managers to create visuals. Examples of the new conditions identified by this study include the executives disclosing the significant time pressures they face, and their tendency to be board members on projects for which they may not have domain expertise. In terms of the elaborated conditions, Chang et al. (2013) make brief reference to the administrative challenges that can be encountered when creating visuals. This study provides a far greater description of the nature and source of these challenges. Specifically, a lack of software to create visuals, training to build skills in this area, the absence of standards relating to visuals, and time constraints.

To summarise, this study has identified further conditions required for visuals to be an effective engagement device. These contributions have been made based on the empirical setting of engaging executives and as such, claims of extensibility beyond an executive audience should be tempered, particularly if the recipient of the visuals does not face the conditions experienced by the executive participants in this study.

### 5.3. Methodological contribution: a visual depiction of project phenomenon

Using an influence diagram to present the findings of a thematic analysis is a methodological contribution. The study's methodology demonstrates how interview transcripts can be thematically analysed and the resulting themes represented visually as a network of influencing conditions. Such representation may be useful in future research that aims to visually depict complex phenomena that has been explored using qualitative techniques. This methodology is proposed to be particularly useful where positivist or quantitative methods have not been used, yet there is a desire to begin modelling the phenomena to show how a particular situation is intensified (i.e. reinforcing loops) or dampened (i.e. balancing loops).

In this study, this diagrammatic representation reveals the connectedness of conditions that result in the effectiveness of visuals in practice. Through representing the conditions as an influence diagram, it becomes evident that it is not just the capability to create the

visual (category 2), or the particular features of the visual (such as showing the so-what clearly – category 3) that influences their effectiveness. It is also the disposition of the executive, which is a reflection of their working conditions. The bottom left-hand side and centre shows the point of connection between Category 1, 2 and 3 conditions, and how the ongoing use of visuals is reinforced. The layout of the conditions in clusters in the diagram, and the syntax of 'actor: condition', brings emphasis to the source of conditions and can aid in the interpretation of the phenomena. For example, in Fig. 1 organisational and project manager conditions are on the right-hand side, and executive conditions are on the top left-hand side. This assists the reader in describing the situation and, if desired, potential points of intervention to influence the phenomenon.

### 5.4. Practice contribution: creating visuals as an underdeveloped project managing capability

The results of this study highlight an area of project management practice that is underdeveloped. The importance of communication and engagement has been discussed as part of the broader recognition of the human aspects of managing project work (see, for example, Brière, Proulx, Flores, and Laporte (2015); Zuo, Zhao, Nguyen, Ma, and Gao (2018)). However, this study makes an important contribution in disclosing the conditions required for project managers to create visuals that effectively engage executives. Notably, as admitted by several of the practitioners and noted by the executives, creating visuals is not a widespread skill and is commonly hindered by organisational conditions.

Organisational support was found to be a critical influence on an individual's skill to produce visuals. Project managers reported that they lacked access to software to develop visuals in an efficient manner. Many of the project managers highlighted that training in creating visuals is lacking. This deficit relates to both software skills and skills around visualising concepts themselves (independent of the software). None of the project managers in this study identified understanding executive information needs as a competency. However, many of the executives indicated that the ability to discern relevant information is not universal among project managers.

There is evidence to suggest that the executives are influenced by various authorities on what artefacts should be associated with project work (for example, Gantt charts or variations from baseline). These preferences are unsurprising given the epistemological dominance of the project management body of knowledge (van der Hoorn & Whitty, 2015). However, the participants described how a simplified timeline with key activities provided the right level of information rather than a detailed Gantt chart. An overreliance by executives on what they believe they *should* see, based on the bodies of knowledge and other mainstream training, may mean that valuable information is missing. For example, recall the challenge faced by PM09 in explaining to executives the criticality of team dynamics. Coupling this insight with the executives' preference for consistency in visuals, points towards a need for the establishment of standards or templates for visuals within an organisation. These standards could include visual archetypes for presenting different types of project information to stakeholders. Ideally, such archetypes would assist project managers to show the challenges that they face in delivering projects: the lived experience, rather than reinforcing dogma (see, for example, van der Hoorn and Whitty (2015)).

### 5.5. Practice contribution: an insight into the experience of executive stakeholders

The conditions on the left-hand side of Fig. 1 (i.e. Category 1), disclose conditions of the executive work environment such as busy-ness, information overload, and the need to get across information quickly. These conditions were a common situation for the executives interviewed and are relevant when explaining why visuals can be an effective



engagement device for project managers to use. Project decision-makers and other powerful stakeholders are under constant time pressure. Project managers also commented that some executive stakeholders lacked the relevant technical knowledge related to the project at hand, and some executives recognised this condition of their situation. Visuals are a way to mitigate these expertise gaps. In short, the study has revealed another facet of the lived experience of project work, where the capability of critical executive stakeholders is pushed to its limits. This situation of stretched capability is a principle characteristic of project work (van der Hoorn & Whitty, 2016).

This has implications in terms of due diligence and sound decision-making. Visuals have value to executives, but if they oversimplify a matter or in some way distort the facts, then both executives and project managers become vulnerable to poor decision-making. This matter does not only relate to visuals, but to sharing information generally (Gerald & Arlt, 2015). If project work is undertaken under significant time constraints, where decision-makers do not have foundational technical knowledge about the project area and do not have time to build an appropriate depth of understanding, then this is likely to become a source of stress for both executives and project managers.

### 5.6. Limitations and future research opportunities

These theoretical and practice contributions are tempered with reference to the exploratory nature of the study, including its sample size and snowballing recruitment strategy which potentially biases the results. Such limitations point toward the need for further studies to validate the influencing conditions derived from this research and their relationships. For example, experiments could test the absolute necessity and varying weights of particular conditions. Exploration of sector-specific conditions (for example, in the construction versus information technology environment) may bring further nuance to the influencing conditions required for effective engagement using visuals. Likewise, similar studies that examine the use of visuals as an engagement device with non-executive stakeholders may be a worthy undertaking. Larger-scale studies with participants from a diverse range of countries would also be necessary to establish cross-cultural generalisability.

The influencing conditions within the diagram also point towards future research opportunities. For example, there is an opportunity to develop and test visual archetypes (the basis of organisational standards for visuals) that would assist project managers in describing the actuality of project work. From a more critical perspective, the experience of executives under significant time pressure and information overload in project work is a matter for further exploration. Additionally, as raised by the participants, visualising information is time-consuming, and this condition influences project manager's creation of visuals. This raises the question: what can project managers stop or reduce doing to enable them to invest time in developing visuals? Echoing the sentiment of some of the interviewed executives, perhaps the discipline needs to review the tasks that project managers undertake and shift their practice profile toward tasks that have the greatest impact. Future research could consider the comparative value of activities undertaken by project managers and what is prioritised. This research would need to take account of differences in project environments, as the relative importance of project management activities is likely dependent on context.

## 6. Conclusion

A project manager's skill at effectively engaging executive stakeholders is critical to project success (refer Section 2.1). Subsequently, this exploratory study aimed to build understanding of the conditions

influencing the use of visuals as an effective engagement device. The results of the study are twenty-nine conditions and an influence diagram showing how these conditions relate to each other. While some of the conditions have previously been identified in the literature, many are new or have been captured with greater nuance than previously. The representation in the influence diagram provides a 'big picture' view of how the conditions relating to the executive (Category 1 conditions), and conditions pertaining to the organisation and project manager (Category 2 and 3 conditions) together influence the effectiveness of visuals as an engagement device. Furthermore, the Category 4 conditions show how ongoing use of visuals is motivated.

The twenty-nine influencing conditions for the use of visuals as an effective engagement device are categorised as follows: the executive's disposition to the use of visuals (Category 1); the organisational conditions to create visuals (Category 2); the project manager's understanding of the executive's information needs (Category 3); and the executive's and project manager's appreciation of the benefits of using visuals (Category 4). The executives' predisposition to visuals was ubiquitous amongst the interviewed participants. However, project managers' skill in understanding the executives' information needs and the organisational support for project managers to create visuals varied, and the influence diagram shows the resultant hindering of the creation of visuals. While the interviews revealed a broad similarity in the experiences of the project managers and the executives, generalisability cannot be claimed given the exploratory nature of this study as outlined in Section 5.6.

This study provides theoretical, methodological and practical contributions. Theoretically, there is the validation of existing knowledge relating to visuals in project work. Also theoretical is the identification of new conditions that influence the effectiveness of visuals as an engagement device. The 'big picture' provided by the influence diagram reveals the interrelated nature of the influencing conditions. This representation of the thematic analysis outputs in an influence diagram is a methodological contribution. In this study, the diagrammatic representation, makes it more evident how ongoing use of visuals is reinforced, but equally how conditions can stifle their creation (balancing), and therefore hinder the effectiveness of visuals as an engagement device. For practice, the capability to create visuals is underdeveloped and remediation of this is likely to require organisational support such as software availability, training and visual archetypes. Furthermore, the lived experience of executives is disclosed along with their potential vulnerability, given that they are time-poor and may not have domain knowledge relating to the decisions they are making. Visuals can be an effective device for project managers to engage executives and, as revealed by this exploratory study, there is a network of influencing conditions that combine to hinder or facilitate this effectiveness and motivate their ongoing use.

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