

Detect, reflect and adapt: factors influencing critical project decisions



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Natalie is a passionate advocate for empowering others to think differently for the purpose of improving practice through research. Her research works with individuals and groups to demonstrate the importance of context, systemic practices and multiple perspectives. Her focus is much more than a study of how practitioners should behave, how and why they think and act the way they do. For her, what is essential is that research enables practitioners to inquire about themselves, others, their interactions and their environment, opening a space for change and even transformation.

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Research participants

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There is significant evidence reinforcing a need to pay more attention to the ways that project decisions are made

1. Executive summary

1.1 Why was this research undertaken?

Effective decision-making is deemed to be integral to the successful management of projects and is considered to be a core project management competency (Alvarenga et al, 2019; Stingl & Geraldi, 2017). However, research demonstrates that nearly half of unsuccessful projects (47 per cent) are impacted by poor decision-making (PMI, 2015). Psychological and behavioural aspects of project decision-making have been identified as one of six themes associated with poor project performance (Denicol et al, 2020). A significant body of research also demonstrates that decision-makers systematically deviate from recommendations produced by decision models and perform very differently to rational optimising decision-makers (Simon, 1947; Kahneman and Tversky, 1973). Finally, project research suggests that patterns of decision-making behaviour are often taken for granted and habitual, taking practitioners along an unconscious path of action (Ison, 2017; Nutt, 1990).

There is significant evidence reinforcing a need to pay more attention to the ways that project decisions are made, and the importance of further research focused on individuals and social forces that impact project decisions. In response, the research findings summarised in this report shed light on the ways project decisions are made in practice, with a focus on improving decision-making effectiveness. This study draws insights from several theories, explores project decisions as complex social phenomena and proposes an alternative but complementary perspective to linear and rational decision-making practice.

1.2 What did the study aim to achieve?

This report takes the first step in building a clear picture of the ways that critical project decisions are made in practice. The intention is to suggest ways to enhance practitioner understanding of how decision-making effectiveness can be improved through simple techniques that can be embedded into daily practices. The study asks: what are the factors that influence decision-making in practice and how can project professionals ensure that critical project decisions are as effective as they can be?

1.3 Who is the intended audience?

The primary audience for this report is project professionals with responsibility for making decisions about or within projects. The secondary audience includes trainers and academics responsible for advancing project management theory and practice, especially those concerned with decision-making.

1.4 Benefits

By improving decision-making effectiveness, practitioners can:

1. **Support leadership development of project professionals** through greater understanding of the impact of cognitive decision-making processes and situational factors that are perceived to contribute to successful project decisions.
2. **Enhance team dynamics and performance** through the lens of decision-making styles that provide insights and a common language for understanding individual differences. With an understanding of style, project professionals are better positioned to implement strategies to improve interactions with team members and project stakeholders.
3. **Embed simple, but not simplistic approaches** within project decision frameworks. Reflective practices and structured micro-debriefs provide a means to inquire about the decision environment and put insights and strategies into practice during the project to maximise lessons learnt and expert knowledge.
4. **Support continued professional development** within the project management profession. Simulations provide an immersive and challenging environment that assists project professionals to practise, reflect, and engage in giving and receiving feedback and systemic thinking.

1.5 How was the study carried out?

The empirical results have embraced several data collection methods that seek to understand how decisions are made in practice from the perspective of project professionals. A survey of 430 responses captured decision-making styles and perceptions of UK project professionals.

In addition to the survey, 30 semi-structured interviews were conducted to understand the experiences of project professionals. The findings and feedback from the interviews were critical in shaping the interpretation of the survey findings and designing a project simulation workshop for project professionals. Lastly, 30 participants were recruited through project management professionals' established networks to take part in one of three simulation workshops. The simulations validated the previous findings and provided in-depth practical insights with practitioner professional development in mind.

1.6 What did the research discover?

The results of the Decision Style Inventory (DSI) demonstrate that project professionals have a blend of styles when they make project decisions. It would be rare to observe a decision-maker with only a single decision-making style; only one per cent of this sample had a decision-making style profile of a single very dominant style. Instead, a typical decision-making style profile of a project professional would have one or more dominant styles (69 per cent perceived themselves as analytical decision-makers) with at least one, and more often two, backup styles.

As so much depends on the environment and circumstances in which a decision-making style is used, this study proposes a dynamic framework that brings an awareness of the interacting components and entwined factors of project decisions. The findings suggest that this awareness brought transparency to how complex project decisions are in practice. The study explores project decisions through a dynamic model of project decision-making as a way to enhance and even predict decision-making effectiveness.

The findings suggest that, while linear decision models are useful, they do not explore the impact of personal and social forces on project decisions. In doing so, three levels of emergent decision-making behaviour were observed and are presented as a three-level framework of decision-making practice: detect, reflect and adapt. The framework gives attention to the behaviour and actions of the decision-maker and suggests that project professionals are required to move between all levels of practice. This framework is used to make recommendations on how project professionals can enhance their decision-making effectiveness.

As project complexity and uncertainty increase, a greater emphasis will be placed on project professionals to become more effective at making project decisions. This study observed three critical decision-making practices: the ability to detect, reflect and adapt when making project decisions. In doing so, project professionals were seen to be more effective as a deeper comprehension of why they choose to make decisions in the way that they do emerged.

The results of the DSI demonstrate that it would be unreasonable to suggest that there is a stereotypical way that project professionals make project decisions



Figure 1.1: Three levels of decision-making practice

Based on the exploratory research undertaken, four simple practices are proposed that assist project professionals in improving the effectiveness of their decision-making. They are as follows:

1. Project decisions are dynamic, therefore it is essential to consider the cognitive and situational factors that influence project decisions.
2. Structured reflective practices enable project professionals to learn from their experiences and enhance how they make decisions.
3. Embedding structured debriefs into decision processes provides opportunities to make sense of the decision situations and assess appropriate styles and strategies of decision-making.
4. Timely feedback must be incorporated within an iterative decision process that is broader than performance-related aspects of project decisions.

2. Literature

Linear and rational decision-making models have a long tradition in project management with a focus on quantitative, technical and objective aspects of project decisions. Emphasis is often given to what decisions need to be made across the project life cycle and how project professionals should make decisions. As a result, there is often a tendency to shy away from the complexity of human behaviour and obscure the impact that behaviour has on the success of decisions and, ultimately, project success. This study draws on insights from several theories, exploring an alternative but complementary perspective to linear and rational decision-making practice. Instead of seeing decision-making as a process of divisible discrete steps, the entwined nature of project decisions is introduced.

2.1 Decision-making through a cognitive lens

A series of critical cognitive processes and activities are involved when making project decisions, as indicated in Figure 2.1. Figure 2.1 provides a static representation of what is, in reality, a dynamic process, as real project decisions are rarely made in a 'precise' sequence due to the interactions, feedback, negotiations and compromises that occur between the five processes. Therefore, decision-making from this perspective is not deemed to be a reflex, or a conditioned response to a stimulus; instead, decisions emerge from the cognitive process and interactions.

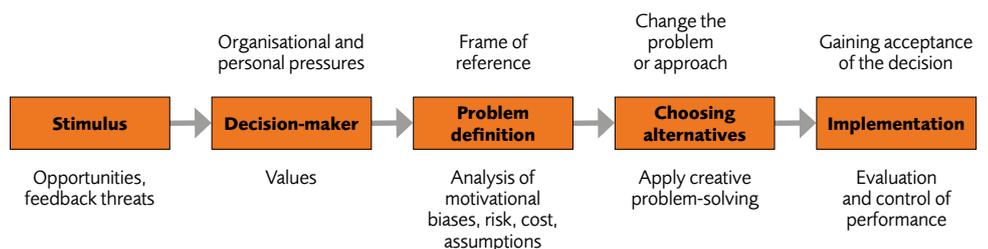


Figure 2.1: Decision process (cited in Rowe & Boulgarides, 1992:12)

2.2 Decision-making styles

Decision-making styles are conceptualised as cognitive processes representing the way individuals perceive a stimulus (cognitive complexity), how they evaluate a stimulus (values orientation) and how they approach and formulate a decision (Rowe and Mason, 1987). Decision-making styles are a synthesis and a projection of a personal system of values, needs, beliefs and practices that form patterns of behaviour acquired, reinforced or modified over time. Research has demonstrated that they are often taken for granted or unconsciously applied to a decision-making process (Nutt, 1990; Rowe and Boulgarides, 1992).

This study adopts the concept of 'style' to represent a procedure by which a decision is made; it is a distinctive or characteristic way of acting or performing when making a project decision. A large body of research has continued to demonstrate that decision-making styles are a meaningful and significant concept that explains how individual differences influence decisions, a way to understand why individuals faced with seemingly identical decision tasks, approach them so differently (Nutt, 1990; Thunholm, 2004; Wood & Highhouse, 2014; Hamilton et al, 2016; Rowe & Davis, 1996; Juanchich et al, 2016; Pajala, 2019).

2.3 A theory of personal constructs

George Kelly's Personal Construct Theory (Kelly, 1955) proposes that individuals make predictions and interpretations and that the differences between individuals result from the difference in the ways they predict and interpret events. In acknowledging such differences, Kelly made the assertion that while some interpretations are more useful than others, no single interpretation is complete or completely accurate, as they are based on a person, unique situation, time and place.

Kelly's basic theory centres on the idea of the 'construct', which provides a window through which it is possible to understand an individual's way of thinking, how they structure, interpret and anticipate events. Personal constructs are the basis of sense-making. Constructs are bipolar in nature; they are pairs of distinctions made by an individual, a way in which some things are construed as being alike and yet different from others. For one person, the opposite of 'rational' may be 'irrational'; for another, the opposite could be 'emotional'. Each differ in their underlying meaning. This bipolar nature of a construct is one of its important properties and it is this quality that sets a 'construct' apart from a 'concept' and rules. Constructs are therefore not ideas, or simple verbal labels imposed upon features of things, nor a way to provide categorisations of reality.

Personal construct theory opens a space to understand a person's response to a situation, in this case a project decision, through an awareness of their person's construct system (or schemata, or frame of reference), their beliefs, perceptions and interpretations. Sense-making and learning are important aspects which are ongoing iterative experiential processes. This draws attention to the perspective that physical characteristics of the situation are not relevant in themselves, but only with respect to their meaning to the person.

2.4 Systemic lens

Through a systemic lens, project decisions can be seen as a whole, the factors that make up the whole and their relationships. Through this lens, decisions are treated as social systems, with a focus on complex human behaviours, the array of multiple perspectives and agendas and the flux of events influencing each project decision. It is through this lens that it is possible to understand decision-making practice. Table 2.1 describes how the adoption of a systemic lens can provide an extension to traditional decision-making practices.

	Traditional decision-making practices	Systemic decision-making practices
Approach	Systematic • Linear • Hard systems paradigm	Systematic and systemic seen as a duality • Iterative • Soft systems paradigm
Orientation	Process, reporting, deliverables and targets defined up front and fixed	Action, practice and learning embedded with approach
	Pre-defined, a single approach, a search for solutions	An adaptive and emergent approach embracing uncertainty
Knowledge information	Objective – focused information, making the right decision	Subjective – learning inquiry that focuses on multiple and conflicting sources
Lessons learnt	Post-implementation evaluation, reviews and feedback	Embedded reflective and debrief practices
Social	Individuals and teams are doing their part in isolation.	A social inquiry that considers interdependencies

Table 2.1: Characteristics of systemic practices as an extension to traditional decision-making practices

2.5 A classic but often forgotten framework

It can be argued that project decisions are influenced partly by the decision-maker and partly affected by situational factors, but it is the interactions of both that will determine the response, and ultimately the way project decisions are made. This perspective is aligned to the work of Kurt Lewin (1935, 1951), who sought to apply the principles of Gestalt psychology to the study of social behaviour, and its famous assertion that "the whole is greater than the sum of its parts". Thus, it is the personal and environmental determinants combined that cause an individual to do what they do. This is represented as a formula: $B = f(P, E)$. In this formulation, B stands for the individual's overt, publicly observable behaviour. P stands for all the causal factors that reside within the individual person. And E stands for all the causal factors that reside in the world outside the individual, including aspects of the physical and socio-cultural ecology. The comma (,) in the equation indicated that Lewin was open to how these factors combined.

Lewin also emphasised the importance of the psychological situation (Lewin, 1931/1935), which gives attention to how reality is what is perceived or is believed to be true. This study draws attention to the cognitive construction of a decision, a person's interpretation of the decision and the meaning they attach to the decision, as a way to understand how and why project professionals make decisions in the way that they do.

3. How was this study carried out?

This exploratory study follows what is referred to as a 'practice turn'. This approach enables the investigation of decision-making practices and project professionals' experiences. The empirical results have embraced several data collection methods, including online surveys, in-depth qualitative interviews and simulation workshops to address the following research questions: what are the factors that influence decision-making in practice and how can project professionals ensure that critical project decisions are as effective as they can be?

Three supporting questions are provided:

1. What are the salient features of project decisions?
2. How does an awareness of the salient features influence the effectiveness of project decisions?
3. How do individual and social forces interact and influence project decisions?

The data collection and analysis were conducted in three sequential phases, which have been summarised below, together with an overview of the participant characteristics:

Phase 1: The online survey provided an initial understanding of the way project professionals make decisions. A standard Decision Style Inventory (DSI) (Rowe & Mason, 1987, p38–39) was implemented and scored against, using Rowe and Mason's (1987) intensity level definitions. In addition to the DSI, five-point scales and open-ended questions explored the current perspectives of decision-making practices and challenges within a project environment. Data coding followed the recommendations of Saldanha (2016) and adapted a three-stage cycle whereby emergent themes were discovered from data and validated within the semi-structured interviews.

Established professional networks were used to invite UK project professionals across 18 industries to take part in this research study. Four hundred and thirty project professionals completed and returned the online survey, representing a response rate of 21 per cent. The demographic characteristics are shown in Table 3.1.

Gender	n	%	Industry	n	%
Male	346	80	Aerospace and defence	9	2
Female	79	18	Business and professional services	15	3
Prefer not to say	5	2	Central government	5	1
			Construction/built environment	106	25
			Consultancy	37	9
Age			Education	7	2
18–24	10	2	Energy and utilities	45	10
25–34	81	19	Financial services	34	8
35–44	124	29	Health	28	7
45–54	155	36	IT	41	10
55–64	53	12	Local government	24	6
65–74	7	2	Manufacturing	3	1
			Retail and wholesale	18	4
			Telecoms	10	2
			Transport and logistics	21	5
			Other	27	6

Table 3.1: Demographic characteristics of the online survey sample

The interviews were critical in shaping and enriching the interpretations of data collected from the online surveys

Phase 2: Semi-structured interviews were conducted to understand project professionals' experiences and perspectives regarding decision-making within a project setting. The interviews were critical in shaping and enriching the interpretations of data collected from the online surveys. Interview participants identified and validated the conceptual framework (Figure 2.1) that named the dynamic components of a project decision. Interviews lasted between 20 and 45 minutes. The discussions also played a critical role in the design and implementation of a project decision training simulation workshop (Phase 3). The audio recordings were transcribed and analysed using the same approach as Phase 1.

The sample represents 30 project professionals (of whom 12 are women) who each had over 10 years of project management experience and regularly engaged in making project decisions. They worked across a variety of industries, including construction (30 per cent), consultancy (32 per cent), IT (17 per cent), manufacturing (17 per cent) and local government (seven per cent). They were predominantly project managers (60 per cent), programme managers (23 per cent) and project management consultants (10 per cent).

Phase 3: Project decision simulation workshops utilised an advanced management computer-based simulation offered by Prendo Simulations Ltd and developed in collaboration with the Major Projects Association. Prendo's Spatium simulation frames a series of realistic project scenarios based on a construction project of a UK football stadium over a two-year period. Within small groups (two to four members) participants engaged in making critical project decisions relating to project success, contract and procurement strategy, resourcing and scheduling, scope definition, risk and stakeholder management.

The purpose of the project simulation was to gain in-depth practical insights and explore and validate the findings from the previous stages. Additionally, the workshops were designed with practitioner professional development in mind, aiming to: (i) successfully assist decision-makers to explore project decisions through a dynamic lens; (ii) demonstrate that decision behaviour (individual and social) can be investigated through observations and reflections of project professionals; and (iii) demonstrate the benefits to practice of embedding and facilitating reflective and systemic practices into project decision-making.

Workshop participants (30 project professionals, of whom 11 were women) varied in their experience: 20 per cent had less than five years of project management experience, 30 per cent had six to 10 years' experience, 33 per cent had 11 to 20 years' experience and 17 per cent had over 20 years' experience. The participants worked across a variety of industries, including business and professional services (17 per cent), construction (13 per cent), education (seven per cent), energy and utilities (10 per cent), health (three per cent), IT (10 per cent), local government (seven per cent), manufacturing (20 per cent), retail and wholesale (seven per cent) and others (seven per cent).

4. Findings: dynamic nature of a project decision

The findings reveal that project decisions are a collection of interrelated and dynamic components, namely decision task, decision context, decision process, decision outcome and decision-maker, as illustrated in Figure 4.1. Through this lens, attention is given to the intertwined relationships that exist within and between each component (illustrated through the bi-directional arrows). With this appreciation, the often-unseen forces influencing project decisions will emerge from these interactions.

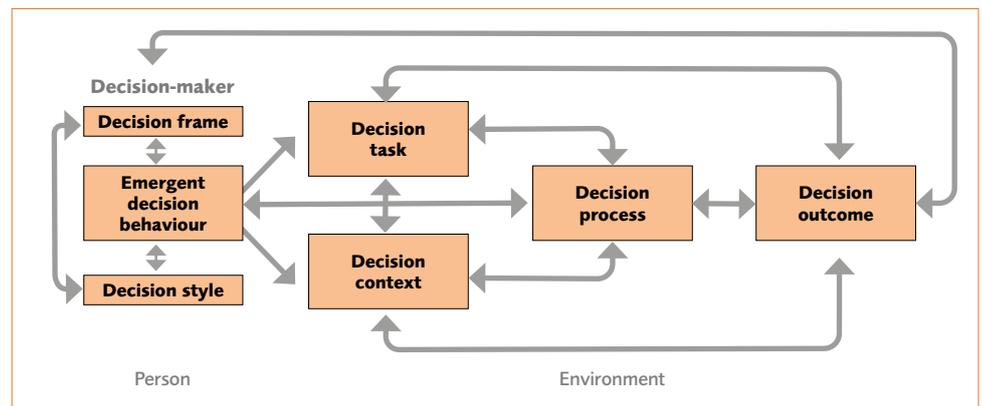


Figure 4.1: The dynamic model of decision-making

4.1 Decision-maker

The decision-maker is a project professional who has responsibility for the whole or part of the decision process. Each decision-maker will draw upon:

- A. Decision frame (perspective or cognitive map) is mapped and explored through the articulation of an individual's personal construct system. This establishes boundaries and constraints that guide the decision-maker's behaviour.
- B. Decision style, described as a psychological measure of decision-making that characterises how an individual perceives, comprehends and responds to a decision-making task.

This study reveals that the decision-making behaviour emerges from interactions between the project professionals and their environment. From this perspective, this study focuses specifically on **emergent decision behaviour** of project professionals, giving equal attention to the internal environment of the project professional (psychological forces – needs, beliefs, values, preferences and experience) and how they interact with the external decision environment (relational and contextual forces – information, language, behaviour and actions). Box 1.1 describes the properties of the decision-maker(s).

Box 1.1 Properties of the decision-maker

Attitudes, beliefs, capabilities, confidence, demographics, experience (practice), emotion, knowledge (project management and industry), orientation, personal agenda, predispositions, professional role, qualifications, risk perception, self-efficacy and values.

4.2 Decision task

The decision task is often referred to as a decision problem or decision situation. Essentially, it is the task dealt with within a decision process and is characterised by unique situational factors. Two orientations portray the decision task:

1. Complexity orientation measured on a continuum from highly ambiguous to highly structured.
2. Value orientation measured on a continuum from technical to relational.

Box 1.2 summarises the properties of the decision task from the perspective of the project professional. What was most revealing is that the findings demonstrate that the properties of the decision task depend upon the perception of the decision-makers themselves.

Box 1.2 Properties of the decision task

■ Value orientation:

- **Relational:** Accountability, agreement/consensus, authority, credibility, confidence, conflict, communication, engagement, empowerment, composition of team, social decision frame, team integration, team orientation and trust.
- **Technical:** Information (amount, availability, quality), importance, performance measures (time, cost, quality), number of alternatives, prioritisation, risk and urgency.

- #### ■ Complexity orientation:
- Type of decision (structured/unstructured, stable/complex), recurrence (familiar/unique), type of involvement (individual/group), level of decision (tactical, operational, strategic).

4.3 Decision context

The decision context includes the environment in which the project task is embedded such as project, organisation and industry. The contextual conditions each shape the decision task and the process of decision-making. The contextual properties are often perceived as being outside of the control of project professionals and often relate to properties of the project and/or organisation. Box 1.3 summarises the properties of the decision context.

Box 1.3 Properties of the decision context

Change readiness, change requirements, competition, culture, customer focus, economic conditions, governance, learning capability, legal standards, organisation strategy (vision, goals, objectives and values), politics, resources, risk preference, stakeholders, sustainability, technology, uncertainty (risks as well as opportunities).

4.4 Decision process

The decision process refers to the steps, tasks and activities that lead to a decision. The findings suggest that project professionals have a dominant focus on explicit actions within a process rather than a consideration of the cognitive process of a decision. Box 1.4 summarises the properties of the decision process.

Box 1.4 Properties of the decision process

Cognitive and psychical attributes associated with: team decision preference (traditional, agile etc), problem exploration, fact and information gathering, options generation and evaluation, implementation, monitoring and control, transparency, communication, reporting and auditing, decision-making roles.

The contextual properties are often perceived as being outside of the control of project professionals and often relate to properties of the project and/or organisation

4.5 Decision outcome

Decisions outcomes are the actions and consequences that follow the decision process. They encompass post-decision performance and, by implication, judgement and satisfaction regarding the decision. Box 1.5 summarises the properties of the decision outcome.

Box 1.5 Properties of the decision outcome

Perception of: impact, feasibility, right, inclusive, pragmatic, quality, satisfaction, systematic, speed.

Four dimensions emerged when discussing the properties of decision outcomes. It became apparent that the evaluation of decision outcomes is influenced by the decision-maker's perceptions of the nature of decision-making.

1. **Performance aspects:** This dimension was the most prominent, with clear links made to project performance measures, and the efficient management of project resources.
2. **Process aspects:** Representing two perspectives: (i) optimising – 'make a right decision'; or (ii) sacrificing – 'make a good enough decision'.
3. **Relational aspects:** Concerned with stakeholder engagement, satisfaction and perceptions of project success.
4. **Internal aspects:** These give attention to the personal influences, learning, development and skills of the decision-maker.

4.6 Implications for practice

The findings demonstrate that decision-making is not a simple linear process of making 'a right decision'. Becoming aware of the dynamic nature of project decision-making enables project professionals to modify their actions and behaviours in accordance with the surrounding and often changing decision environment.

5. Findings: the influence of style

Decision-making styles provide a valuable and practical step to explore decision-making behaviour in projects. Drawing on classical literature on decision-making styles, this study describes how project professionals visualise, think and react when making project decisions.

5.1 The project professional decision-making style profile

The analysis of UK project professionals' decision-making styles was mapped against the Cognitive-Contingency decision-making style model (Figure 5.1), revealing that the majority of project professionals (69 per cent) perceive themselves as analytic decision-makers. This finding is not surprising, given that an analytical approach to decision-making is supported within mainstream project management literature and training. The findings also reveal that project professionals are more likely to adopt a behavioural (30 per cent) or conceptual (29 per cent) decision-making style as their backup style, ie one that is used occasionally. The analysis shows that the highest percentage of propensity is aligned to a backup style, suggesting that while project professionals possess a tendency towards an analytical decision style, they perceive that they are able to adapt and use an alternative (backup) decision style.

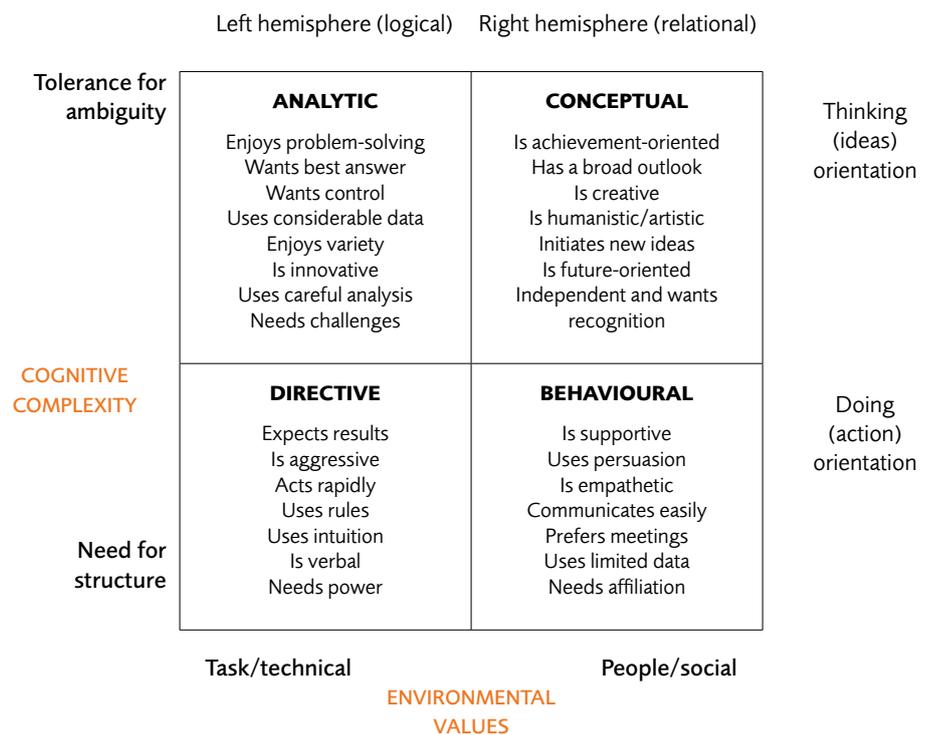


Figure 5.1: Cognitive-Contingency decision style model (Rowe & Boulgarides, 1992:29)

5.2 Decision-making styles and their effect on group interactions

Although a project professional can decide alone, they are not doing so in isolation. Project decisions are social phenomena involving many individuals, groups and organisations. Observations and personal reflections made by participants during the simulations demonstrated that project professionals with similar styles understand one another more easily than they understand someone with a different style. For example, project professionals with a preference for directive and behavioural styles demonstrated little tolerance for the lengthy explanations used by individuals with an analytical decision-making style. From these very simple illustrations it is easy to see that decision-making style helps explain relationships and decision behaviour can be complex to manage within a diverse project team.

Table 5.1 provides a simplistic illustration of decision-making style compatibility and incompatibility among project professionals based on literature (Rowe & Boulgarides, 1992). During debriefs, project professionals confirmed that having an awareness of their own and others' decision-making styles improved how they worked together to make decisions. The majority of participants were able to adapt how they interacted and worked together as a group, improving communication and identifying and agreeing tasks to be completed.

	Directive	Analytic	Conceptual	Behavioural
Directive	C	M	X	S
Analytic	M	C	M	X
Conceptual	X	M	C	C
Behavioural	S	X	C	C

Note: C = compatible; M = moderately compatible; S = slightly compatible, X = generally incompatible

Table 5.1: Decision-making style compatibility

The findings suggest that an awareness of decision-making styles improves how teams work together – something crucial for building and working on successful and productive project teams. Personal reflections suggest that reflecting on the compatibility of decision styles assisted project professionals to understand obstacles that can hinder effective decisions being made, improving empathy towards others.

5.3 Alignment to decision task characteristics

Building on the findings of decision-making style compatibility, the workshops also considered how a project professional's decision-making style is aligned to the decision characteristics. Table 5.2 provides an illustration of typical decision task characteristics and associated compatible and incompatible decision-making styles. There was agreement that there is no single style that is always more effective than another; the concept of 'alignment' and the ability to 'flex' are vital skills.

DECISION TASK CHARACTERISTICS	DIRECTIVE	ANALYTIC	CONCEPTUAL	BEHAVIOURAL
The decision task is seen as stable, where there is a clear and undisputed cause-and-effect relationship, and when a right answer exists and can be understood collectively.	C	M	X	S
The decision task involves more than one right answer; cause-and-effect relationships are discoverable but not immediately apparent; or there are several options or solutions and fact-based management is used to guide appropriate action.	M	C	M	X
The decision task may involve competing ideas, which is unpredictable and most suited to creative and innovative approaches. There is no immediate solution, but patterns emerge over time; thus a long-term approach and search for unknown variables is needed.	X	M	C	C
The decision task requires proactive communication that takes a more contemplative approach by discussing solutions that have worked in the past rather than trying to reveal new patterns.	S	X	C	C

Note: C = compatible; M = moderately compatible; S = slightly compatible, X = generally incompatible

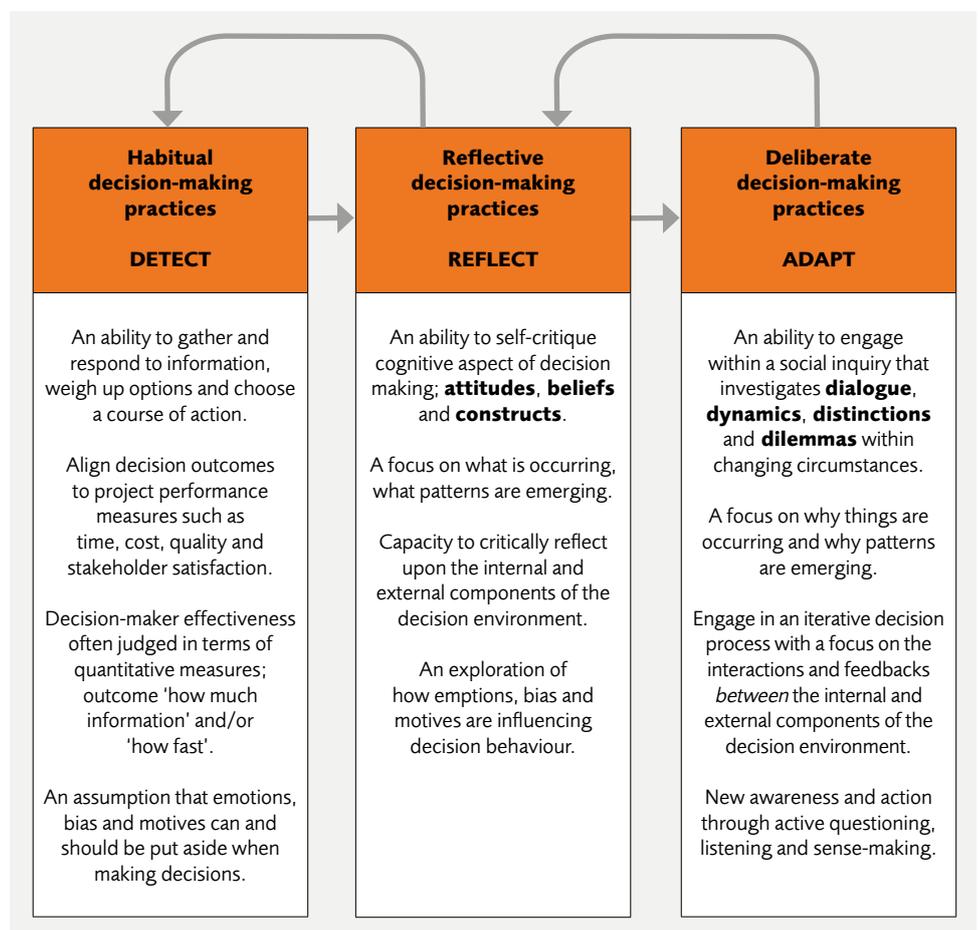
Table 5.2: Decision task characteristics

5.4 Implications for practice

In summary, decision-making styles are not fixed behaviours, they are learnt, and therefore project professionals can learn to adapt and make decisions differently. This brings into focus that effective decision-making is more than selecting an optimal result; effective decision-making is also concerned with selecting an optimal approach that is aligned to the decision task and those within it.

6. Findings: three levels of decision-making practice

To become effective at making decisions, project professionals must learn to adapt, which is not always a quick and easy thing to do. As projects' complexity and uncertainty increase, a greater emphasis will be placed on a project professional's ability to detect, learn and adapt. This study observed three levels of distinct but interrelated decision-making practice during the project simulations which were deemed by participants as critical practices required for effective decision-making, as illustrated below.



Three levels of decision-making practice

With an awareness and an ability to engage with the three levels of practice, project professionals gain an opportunity to learn more about their decision environment and themselves as decision-makers, and to develop a broader repertoire of decision-making approaches. In doing so, their decision will become more effective as a deeper comprehension of why we choose to make decisions in the way that we do emerges. Several recommendations are made within this report that can assist project projects in moving through and between the three levels of practice in order to enhance decision-making effectiveness.

7. Conclusion

This study identifies the salient features of project decisions from the perspective of project professionals. Most importantly, the findings demonstrate the benefits of considering project decisions as dynamic, prompting project professionals to look beyond linear decision-making practices towards the iterative and relational aspects of project decisions. This study suggests that when a project decision is seen in its totality, project professionals can make sense of factors outside of information provision and quantitative analysis, permitting a deliberate and adaptive response to changing circumstances.

Furthermore, this study proposes that project professionals can transform decision-making practices and influence their emergent decision behaviour. It can be argued that project decisions are influenced partly by the decision-maker and partly affected by situational factors, but it is the interactions of both that will determine the response and ultimately the way project decisions are made.

The project decision workshop explored to what extent individuals influenced and were influenced by decision-making styles and perceptions of others when making a project decision, exhibiting how individual and social forces of decision-making can go unnoticed. Observations made during the project simulations confirmed previous findings and provided in-depth practical insight that demonstrate decision behaviour (individual and social) can be investigated through observations and reflections of project professionals. The study observed three levels of decision-making behaviour associated with 'detect, reflect and adapt' and proposes that project professionals are most effective in making decisions when they engage in all three levels of practice.

This study proposes that project professionals can transform decision-making practices and influence their emergent decision behaviour

8. Recommendations

Based on the exploratory research undertaken, four simple practices are proposed that assist project professionals in improving the effectiveness of their decision-making. They are as follows:

1. Explore the dynamic nature of project decisions

Within a group setting, an awareness of the salient features of the project decision and decision-making styles was particularly useful, providing an alternative language to overcome individual differences, improving communication and reducing tensions in the way decisions are made. The exploration of decision features enabled a wider discussion of previously unquestioned assumptions and the impact of personal experiences and decision bias on project decisions.

2. Make time for structured reflective practices

The findings demonstrate that structured reflections play a critical role in enabling project professionals to learn from their experiences and enhance their learning about themselves and their interactions with the decision environment. Teams that explored multiple perspectives and prior experiences were more likely to alter their decisions in the face of new information. Social reflective practices permit additional learning opportunities as project professionals learn from others and explore specialities and multiple perspectives. This can enhance motivation, collaboration, communication, negotiation, conflict management, trust building, listening, etc.

3. Embed structured debriefs into decision processes

The disruption of debriefs provided an opportunity to 'notice' and make sense, drawing attention to the impact of individual and social dynamics of decision-making. Information sharing increased as well as the articulation of insights from past performance; misunderstandings were explored in a positive manner and preventative action taken. Participants were observed adapting their decision-making styles when feedback was provided immediately following action (debriefs), compared to feedback given at the end of project stages or end-of-session feedback (lessons learnt).

4. Feedback must be broader than performance-related aspects of project decisions

The findings demonstrated that when feedback focuses on decision-making styles, assumptions, beliefs and personal constructs, a shift occurs and decision-makers become more reflective, questioning their own assumptions and those of others. Additionally, the timing of feedback proved to be critical. Behavioural changes were more likely to occur when feedback was provided immediately following action (debriefs), compared to feedback given at the end of project stages or end-of-session feedback (lessons learnt).

9. Areas for further research

Further research could include:

1. The relationship between effective decision-making practices and project success

Exploring the relationship between decision-making practices and project success would enable a greater understanding of how project professionals can maximise the likelihood of project success.

2. The relationship between decision-making style, experience and the decision task through longitudinal studies

Currently unknown are the situations in which project professionals change their decision-making styles. Do decision-making styles align to the decision task? Is adaption a deliberate practice or are changes in decision-making style unconscious? The next step is to investigate project decisions in action.

3. Challenges of embedding a systemic and reflective approach within a project context

It is necessary to explore how challenges related to embedding systemic and reflective decision-making can be overcome. This would lead to refinement of the recommendations made within this report.

4. The influence of cognitive complexity on project decisions

The author would like to encourage further research across multiple decision environments that investigate how and in what way project professionals' cognitive complexity influences their ability to adapt to the decision environment throughout a project. It is proposed that influence diagrams and cognitive mapping would be a useful avenue for future research.

5. The benefits of simulation training as part of continued professional development

It is recommended that a wider exploration of the benefits of using simulation training will support the development of decision-making mastery required for the future and would enable a deeper examination of how, when and why decisions are made the way that they are.

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