

OPTIMISING DECISION-MAKING: DEVISING A FRAMEWORK APPLICABLE TO PROJECT MANAGEMENT PRACTITIONERS

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Abstract: Projects are defined as being temporary concepts which are planned, designed, and delivered to achieve a single aim which is often transformative in nature. Project management is therefore the process of monitoring and controlling such projects to ensure optimal delivery of project outcomes can be achieved. Decision-making is a soft skill which is recognised as being an essential tool for successful project managers to be able to use. Decisions made need to take into account multiple factors including risks and impacts. Because each project is unique, each decision will be unique too. This research study has investigated the concept of decision-making when applied to project management and has considered the drivers, methods and processes which are commonly used. Within this, the concept of Deep Smarts is explored in which a project manager brings together a range of their own personal, and often disparate, knowledge and experiences to make efficient decisions. From this research, a framework is proposed which separates project management decision-making into four elements, these being context, methods, processes and impact. This framework can be used by project management practitioners to aid their decision-making, and to help them to ensure that the decisions which they make, which will have to take into account the risk appetite of the organisation, are not overly influence by stakeholder pressure, and consider the best interests of the project being delivered. As such, this framework can be applied to any project, in any country, in which similar formalised project management processes are utilised.

Keywords: decision-making; project management; project success; project stakeholders; framework; organisational knowledge.

1 Introduction

Project Management has a significant impact upon the international economy. According to the World Bank (2021), 20% of the global economy is based upon project-oriented activities, and it is predicted that this figure will exceed 30% in just a few years. Moreover, 22% of the global gross domestic product, which equates to 48 trillion dollars, is produced by project-based organisations (World Bank, 2021). Given the economic significance of projects, and by association project management, it is important that project managers understand how to optimise their project-based decision-making to ensure that they can achieve high levels of performance.

Building upon other recent studies exploring decision-making within the context of project management (El Khatib et al., 2020; Gali, 2020; Killen et al, 2020), in this paper we will explore the factors which influence good project management decision-making with an emphasis on the softer skills, and bring these findings together in the form of an original framework which can be used by practitioners to enable them to consider how they make decisions themselves,

and which can act as a timely reminder of the relevant key dimensions that they need to take into account to ensure that their decision making is effective.

According to Turner (1990, p.35), a project is defined as being “an endeavour in which human, material and financial resources are organised in a novel way, to undertake a unique scope of work, of given specification, within constraints of cost and time, to achieve beneficial change defined by quantitative and qualitative objectives”. Projects themselves are temporary phenomena used to complete a specific mission (Cleland and Kerzner, 1985) and are often defined as being the creation of a unique product, service or result. Turner states that no two projects will be precisely the same, and therefore it is not possible to implement the exact same management approach each time, as some level of tailoring will always be required to address the specifics of the circumstances. However, there are overarching principles that can be applied to most projects, and these are referred to under the umbrella term of “project management” (Project Management Institute, 2015).

Whilst official project management organisations have no common perception or exact definition of what project management is (Hodgson and Cicmil, 2006; Winter et al., 2006; Thomas and Mullaly, 2009), it is generally considered to be about ensuring the successful delivery of projects in terms of outputs, outcomes and benefits, and the need to meet the complex demands of the stakeholders (Ashleigh et al., 2012; Lenfle and Loch, 2010). Since the 1950s, organisations have increasingly embraced projects as being a tool for dealing with complex situations, increasing work efficiency and productivity, and obtaining company strategic and operational goals (Ika, 2009).

Project Management is therefore, an expanding area of operation utilised by an increasing number of industry sectors. An example of this increase in project management attention is the Project Management Institute’s (PMI) claim that the organisation has one of the world’s largest professional memberships, operating in 200 countries with over 2.9 million members, and 710,000 people holding their prestigious Project Management Professional qualification (<https://www.e-careers.com/project-management-institute>). Hodgson (2004) claims that there is a particular link between the rate of increase in membership of the project management profession bodies and the on-going evolution of its application. Project management has increasingly been established as being the common approach to conducting business in many economic sectors including construction, information technology and engineering (Lindgren and Packendorff, 2006).

Not only has the use of project management as a method become a core element for companies seeking to control and monitor specified areas of activity, but selecting the appropriate project manager to oversee activities has been recognised as being essential for ensuring the successful delivery of any project. Therefore, project managers must be up to date with current thinking. As a consequence of this, it can be argued that project management professionals must continually develop their own knowledge and skills to ensure that they can secure appropriate project management positions in what has become a very competitive market (Crawford et al., 2013).

Despite the modern reliance upon the use of project management to secure project success, there remains a high ratio of project failures which are believed to be caused by project managers having inappropriate soft skills to cope with a modern project’s often chaotic nature (Raheb, 1992; Chipulu et al., 2011; Ojiako et al., 2011). Therefore, it can be proposed that by improving the soft skills of project managers, the proportion of projects considered to be failures may be significantly reduced over time.

Projects themselves include many phases such as initiating, planning, monitoring and closing (Turner, 1990). Each of these stages will have their own sub-elements. Project managers must therefore make a wide array of different (and often unique) decisions to direct a project to its

successful conclusion. Each decision will need to be made considering the context of the project phase, and often these decisions will have to be made based upon vague or incomplete information regarding the potential risks and rewards. Poor decision-making will have serious implications for any project being managed including probable financial, reputational and operational consequences. Therefore, it can be argued that decision-making is now a core component of project management, and such decision-making needs to be flexible, and adaptable, to cope with the intricacies of the modern fast moving project management environment. Litvaj and Stancekova (2015) stress that decision-making is a complex process that requires multiple considerations such as clarifying goals, reviewing options, simulating each opportunity to evaluate potential risks etc. Risk management itself is therefore also an essential element of good project management (Polkinghorne et al., 1996) and appropriate contingency planning is required to mitigate unexpected results and consequences (Qurashi et al., 1996).

Although decision-making is such an essential part of project management, Bakht and El-Diraby (2015) claim that good project decision-making has been on the decline for a period of time. This may be because of the pressure placed upon project managers to make immediate decisions due the potential contractual implications of incurring delays. Therefore, it is important for the modern project manager to consider decision-making to be a critical skill in their personal portfolio, and one which they need to develop and nurture.

This paper reports on a research study which has investigated the concept of decision-making when applied to project management, and has considered the drivers, methods and processes which are commonly used. Within this, the concept of Deep Smarts is explored in which a project manager brings together a range of their own personal, and often disparate, knowledge and experiences to make efficient decisions. From this research, a framework is proposed which separates project management decision-making into four elements, these being context, methods, processes and impact. This framework can be used by project management practitioners to aid their decision-making, and to help them to ensure that the decisions that they make, and which will have to take into account the risk appetite of the organisation, are not overly influence by stakeholder pressure, and instead consider the best interests of the project being delivered.

2 Decision-Making

A decision is a "conscious allocation of resources for the purpose of achieving desirable objectives" (Virine and Trumper, 2008, p.303) which leads to the commitment to take action and/or use of such resources (Boddy, 2014, p.195). Decision-making is therefore a cognitive process relating to the selection of a chosen course of action based upon available options (Simon, 1977). Decision-making is the process of making a choice in which a series of factors are taken into account to consider the positive and negative possibilities associated with each decision outcome, and is a "fundamental skill of project management that can be improved by training" (Virine and Trumper, 2008, p.xvi)

Most researchers claim that decision-making in project management is one of the most crucial competencies for the project management profession (Brill et al., 2006; Lei and Skitmore, 2004; Crawford and Nahmias, 2010; Hwang and Ng, 2012; Bakht and El-Diraby, 2015). Moreover, it can be argued that organisations have developed preferred project-based working styles which influence decision-making (Eweje et al., 2012). An example of this is the risk appetite of an organisation, i.e., how willing is an organisation to take risks. If an organisation's risk appetite is high, then risk taking is often supported, whereas if the risk appetite of the organisation is low, then risk taking is normally avoided. Risk taking can lead to significant positive outcomes such as the early conclusion of projects with associate financial and reputational rewards. Conversely, the very nature of risk taking means that outcomes are not guaranteed, and as a result, it can lead to significant negative consequences

including project failure and consequential financial and reputational damage. In a previous study by Beringer et al. (2013), it was found that many companies have faced such decision-oriented problems relating to projects that they have managed.

To address this issue, several project management organisations, such as Project Management Institute (PMI), Association for Project Management (APM) and the International Project Management Association (IPMA), have published their guidebooks regarding investigations that consider previous projects, summaries of lessons to be learnt, and views of well-known project management scholars. However, as mentioned previously, every project has its unique environment and shape. As a result, project managers may often meet unexpected situations for which they lack the required experience to make informed judgements and decisions. Savelsbergh et al. (2016) argue that any guidance which includes the professional bodies' norms and standards for efficient project management practice, whilst being valuable to help project managers improve themselves as part of their continued professional development (CPD), should not be viewed as offering the only possible solutions as they cannot cover all scenarios. Considering the potential consequences, decision-making remains difficult for project managers, and more support is required.

3 Historical Development of Project Management

Whilst Haughey (2014) claimed that the pyramids construction (2570 BC), and the Construction of the Great Wall of China (208 BC), are early examples of project management due to their division of labour, and their planning and controlling activities, Chiu (2010) counter argues that Henri Fayol (1841-1925), and Henry Gantt (1861-1919), are pioneers of project management due to their seminal works, which are milestones in the development of today's modern understanding of project management.

Henri Fayol was an iron company owner who spent his time finding efficient solutions to improve a big company's direction (Witzel, 2003). He presented five crucial stages in management, these being: planning, organising, commanding, co-ordinating, and controlling (Seymour and Hussein, 2014). In today's project management, there is still considerable discussion and interpretation about Fayol's work. In parallel, Henry Gantt was an American engineer and management consultant. He invented the Gantt Chart to help people organise their complicated work by dividing big projects into smaller administrable tasks.

However, since then, the development of modern project management has progressed significantly, and these advancement are divided into three key time periods which can be grouped respectively as being 1958 to 1979, 1980 to 1995, and 1996 to the present day. This modern era of project management is directly related to the application of management science generated over a long period of time. Thanks to technological developments, key tools were invented, such as the Critical Path Method (CPM) in 1957, the Program Evaluation Review Technique (PERT) in 1958, and the Work Breakdown Structure diagram (WBS) in 1962. The IPMA which was established in 1964, and the PMI which was established in 1969, are two pioneer organisations that have increased project management's reputation in the business world and together they have helped to unify approaches.

Since the introduction of computer power, project management has begun a new era (1980-1995) in which software has enabled the creation of more detailed and organised management of projects. In the most recent time-period, technological developments have surpassed all other previous project management achievements, and there have been moves towards a new focus upon benefits realisation management, and the optimisation of performance by employing agile methods (Bradley, 2010; Serra and Kunc, 2015; Marnewick and Marnewick, 2022).

4 Considering Project Managers

The project manager is a critical stakeholder in any project. They have the ability to significantly influence project success through their decisions and actions (Pinto and Kharbanda, 1995; Brown, 2000; Hyvari, 2006; Creasy and Anantatmula, 2013; PMI, 2015). Much like organisational leadership, an effective project manager requires a wide range of personal and professional skills which include being a good communicator, a strong and inspirational leader, a trustworthy decision-maker, and an empathetic and reasonable observer (El-Sabaa, 2001; Madter et al., 2012; Clarke et al., 2022). These skills are all combined to ensure that they can monitor, control and integrate project stages to ensure a seamless and efficient transition (Ahsan and Ho, 2013; Kerzner, 2013; PMI, 2015). Project managers therefore require the right combination of competences for the project which they manage (Boyatzis, 1982). Competencies in this sense will include those relating to knowledge, attitudes and approaches. Specifically, Parry (1998) classified project managers' competencies as being the acquired knowledge, personal characteristics, and talents of the individual which affect work efficiency and teamwork in organisations. Conversely, Stevenson and Starkweather (2011) argue that the competencies of management professionals, including project managers, can be illustrated as being an insight into a person's accommodating abilities, features and hidden talents which they utilise throughout their career. It has been established that competencies, however they are defined, can have a significant impact upon project success depending upon their presence, or otherwise (Dainty et al., 2005; Stevenson and Starkweather, 2010; Liikamaa, 2015).

Investigating project management competencies, and understanding their relevance for project management professionals, is therefore important. A person may have some essential skills inherently, but others can be acquired through experience. However, each skill or competency, whether ever-present, or gained by experience, will affect the ability of the individual to be an effective project manager, thereby directly influencing project outcomes within their own zone of influence (Dainty et al., 2005; Liikama, 2015).

Whilst project success has traditionally been measured by considering the cost of the project, the time taken to complete the project, and the quality of the results, the so called 'iron triangle', it has long been recognised that this perspective, however useful, is insufficient (Atkinson, 1999). Project owners and stakeholders are often more interested in tangible aspects, and whilst the iron triangle may meet this requirement, in reality, projects are far more complicated, and consideration is required of many additional dimensions of which the project manager themselves are just one (Dainty et al., 2004). The people involved in a project, and the decisions which they make, directly influence project success (Stevenson and Starkweather, 2011).

Project management competencies can be divided into two main areas, these being:

1. Technical (hard) skills
2. Human (soft) skills.

Hard skills can be illustrated by the need for project managers to have an improved level of technical knowledge and/or the progressive application of project management (Ballesteros-Sanchez et al., 2017). They are unarguably crucial for implementing the five stages of project management: 1) initiation, 2) planning, 3) execution, 4) monitoring and 5) closing of a project (PMI, 2013). Determining and measuring hard skills is relatively easy compared to soft skills because hard skills are generally based on certificated operating methods and applications used in particular conditions, and so are based upon facts and data (Ravindarath, 2016).

Whereas these hard (technical) skills are more related to innovations, software programmes, and analytical abilities, human (soft) skills are generally associated with leadership, emotional intelligence, conflict management, change management and decision-making, all of which

Belzer argues can be acquired through experience (2004). El-Sabaa (2001) claims that soft skills are essential for creating a healthy relationship between the project manager and the project's stakeholders.

Many scholars point out the high value of soft skills for successful project management (El-Sabaa, 2001; Dainty et al., 2005; Crawford et al., 2006; Baroudi and Pant, 2008), and reflect on the surprising continued domination of hard skills over soft skills. The project management book of knowledge (PMBOK) follows this trend and provides far more prominence to hard skills over soft skills by illustrating the techniques, tools, and stages of input and output for each process (Khang and Moe, 2008; Hanif and Tariq, 2014; Ramazani and Jergeas, 2015).

Conversely, Creasy and Anantatmula (2013) claim that soft skills have much more effect on project success than hard skills, and so therefore need to be prioritised. In reality, a balance is required as both hard and soft skills are required, and the successful project manager must be able to demonstrate both if they are to be effective (Kumar and Hsiao, 2007; Custovic, 2015). Decision-making is therefore one of the key core soft skills that project managers must have, which is why it is so important develop it, and yet surprisingly it remains underrated given its prominence and association with project success.

5 The Historical Development of Decision-Making

In every moment of life, and through human existence, people have been making decisions, and these decisions may lead to a potentially good or bad outcomes. However, decision-making has only been considered to be a science from the twentieth century onwards. A brief modern history of decision-making is illustrated in Table 1.

Table 1. History of Modern Decision-Making Concepts

Author	Year	Description
Erving Fischer	1907	Net present value which is about only making decisions which have a guaranteed positive outcome.
Von Neumann & Morgenstern	1944	Game Theory which in which decision-making involves two or more decision-makers with different perspectives.
Herbert Simon	1948	Bounded Rationality which is about making decisions with sufficient outcomes, instead of optimal outcomes.
Harry Markowitz	1952	Balances the risk tolerance, and reward expectations, of a project or stakeholders to make decisions.
Learned & Christensen	1960s	SWOT analysis which considers the strengths, weaknesses, opportunities and threats of a situation.
Howard Raiffa	1968	Decision Analysis which is about using decision trees etc to map and communicate possible decision outcomes.
Irving Janis	1972	Group thinking which can create flawed decisions which value gaining a consensus over making the best choice.
Tversky & Kahneman	1979	Prospect Theory which is a rational model for decision-making in which decisions are driven by loss-aversion.
Howard Dresner	1989	Business intelligence which bases decision-making on detailed past, current or predicted future data and trends.
Bazerman & Neale	1992	Connects behavioural decision to negotiated outcomes.

Malcolm Gladwell	2005	Postulates that instantaneous decision-making based upon personal knowledge and experience may outperform decisions based upon detailed analysis.
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Source: Adapted from Buchanan and O'Connell (2006)

5.1 Project Management Decision-Making

Project managers have to face decision-making in every stage of project delivery, from choosing the project team members to achieving the final project outcome. Therefore, making the most appropriate decisions is vital for project management practitioners. An ignored issue can cause a massive impact on a project in terms of cost, time, quality, scope, risk and benefits (Bennett, 2017). For instance, the initial estimated time and budget plans for the Sydney Opera House were \$7 million and five years, however, the actual project was completed in sixteen years and spent approximately £100 million (Murray, 2013). It is claimed that the difference can be traced all the way to back to issues, and decisions, that occurred between the project director and the project architect.

Any typical project includes many stakeholders, and these stakeholders naturally consider their own interests, whether these are personal, professional, reputational, and/or commercial. Therefore, stakeholders' interests can often be the cause of conflict, which can complicate the working environment for project managers to operate in. Making decisions in this type of chaotic situation is one of the most important factors to consider in terms of project success (Thomas and Engel, 2008). Organisations have therefore tried to find decision-making best practice which they can use to mitigate these issues, and to ensure a better overall outcome for all involved in a project.

There are several justifications for searching for optimal approaches to decision-making. Implementing best practice decision-making can potentially:

1. Reduce project costs,
2. Enhance potential project benefits and impacts,
3. Reduce project time to completion,
4. Reduce labour requirements.

Since every project is a unique operating environment, the best practice in this sense needs to be taken in the context of the project, as what may be applicable to one project may not be applicable to another project. Good judgement by the project manager is therefore essential in terms of interpreting what is considered to be best practice for the actual situation, and for which a sensible and appropriate decision is required.

Leonard and Swap (2004) coined the term 'deep smarts' which is a means to express the capability of thinking and acting wisely and insightfully. Moreover, 'deep smarts' refers to an expert's ability to combine their knowledge of dis-similar previous situations to arrive at a decision for a new situation for which they have little direct experience (Manville et al., 2019). Specifically, Leonard and Swap consider for those with Deep Smarts "their judgement and knowledge—both explicit and tacit—are stored in their heads and hands" (2004, p.88).

Explicit knowledge referred to in this sense is consciously obtained knowledge that can be acquired from formal sources such as journals, books, training programmes and/or education (Nonaka, 1994). In contrast, Polanyi (1983) defines tacit knowledge as being experiential, i.e., the capacity to take actions in practice without being able to tell how the movement is achieved. Nonaka and Takeuchi's consideration of tacit knowledge goes further and they claim that tacit knowledge could be transformed into explicit knowledge (Ray et al. 2006), and that such conversions between explicit and tacit knowledge types can be undertaken in either direction through processes of Socialisation (sharing knowledge and experiences,

Externalisation (transferring tacit knowledge into explicit knowledge), Combination (forming links between multiple areas of explicit knowledge) and Internalisation (transferring explicit knowledge into tacit knowledge) which together form the SECI model of knowledge transfer (Nonaka and Takeuchi 1995; Takeuchi and Nonaka 2004) in which a knowledge creation spiral of evolution can be developed. The Deep Smarts concept is therefore a model to express the ability of an experienced individual to combine their explicit and tacit knowledge together, and so demonstrate what we would recognise as being good judgement, thereby indicating the ability to interpret possibilities and act upon them effectively. This is the essence of good decision-making.

5.2 Decision-Making Theories and Methods

Bourgault et al. (2008) argues that the decision-making process itself can operate within one of three primary contexts these being:

- 1) Rational / Bounded Rationality (gathering data, designating options, selecting the most appropriate option).
- 2) Power and politics (decisions made based upon those with influence),
- 3) Garbage can model (disconnecting problems, solutions and participants)

Other rational decision-making models have also been proposed by Mintzberg et al. (1976) and Simon (1965) which are variations upon the theme of sensible decisions being made which are based upon a consideration of the known facts. However, Pfeffer and Moore (1980) claim that decisions are actually most generally made after taking account of the most influential stakeholder's interests, in which case they may have little to do with project need. To avoid this, decision-makers may seek external and independent advice from reputable sources (Eisenhardt and Bourgeois, 1988) so that a balanced perspective can be found. In contrast, the garbage can model disregards both influence and consequences. Instead, decisions are made in a series of metaphorical silos which each ignore the other dimensions of the problem being considered (Cohen et al., 1972) and concentrate instead just on an element of the decision needing to be made. The garbage can model is thought to help individuals avoid taking responsibility by providing a chance for solutions to be presented anonymously, thereby avoiding the pressure caused by the internal politics of a situation often driven by stakeholder priorities.

Decisions themselves can be normative or optimal. Normative decision-making is concerned with an analysis of the possible logical outcomes of the decision being taken, whereas optimal decision-making considers the drivers behind the decisions being taken, and the assumptions being made (Corporate Finance Institute, 2022). According to Watkins (2020), prescriptive theory applies when decision-making is undertaken within constraints which limit the possible options that can be considered, and descriptive theory relates to decision-making which is driven more by moral beliefs than by the available facts. In all cases, uncertainty is present in the form of states that relate to the known facts upon which the decision is based, consequences which are predicted to occur as a result of the decision being made, and the actions required to deliver the agreed decision.

In the UK, the DECIDE model for decision-making has emerged (Guo, 2020) in which the problem is defined (D), the criteria of the problem are established (E), the alternative solutions to the problem are considered (C), the most appropriate solution is identified (I), an action plan is developed (D) and the results are evaluated (E). The simplicity and transparency of this approach has been attractive to the healthcare sector and therefore also has implications for project management professionals.

In addition to the decision-making process, a plethora of decision-making theories have emerged over recent years, for example contingency theory (Cakir, 2012), fuzzy theory (Zhao

et al., 2011), game theory (Castillo and Dorao, 2012), reliability theory (Nair et al., 2018), utility theory (Suda et al, 2015) and resource-based theory (Suda et al., 2015). These different approaches have varying characteristics, and by their very nature, they often target certain aspects of the decision-making process such as the need to mitigate risks, the probability of certain outcomes occurring, the potential value to be added from certain options, and/or the uncertainty of information upon which to base the decision being made.

Underpinning decision-making is organisational knowledge. Walsh and Ungson (1991) postulated that organisational memory is stored in 6 places, these being 1) the people (employees) who work within the organisation, 2) the culture of the organisation, 3) it's transformations in the form of processes and procedures, 4) the structures which are put in place such as the roles and responsibilities of the staff, 5) the ecology and setting of the organisation, and 6) the data archives and records. Project managers are particularly aware of this and create lessons logs at the end of each project, which are stored by the organisation, and used to inform future projects. Such lessons logs help to avoid the repetition of mistakes, and can be used to inform decision-making so that appropriate decisions can be made more quickly.

6 Decision-Making Framework

Within this study we have considered a wide range of factors which include the decision-making of project managers. What has emerged from the research is that some of these factors are associated with the context within which the decisions are being made. The risk appetite of the organisation plays an important part in decision-making, both in term of the speed of the decision-making, and also the outcome. Stakeholders can also influence the decisions, and may well apply unfair pressure to ensure that decisions which are made, are done so in a way which suits their own needs and requirements. Furthermore, there is a chain of command, and there are some decisions that project managers are empowered and authorised to make themselves, and others which need to be considered by a higher authority.

Given the contextual factors described, decision-making is clearly influenced by the project manager themselves. What is their level of relevant education and/or professional membership as the higher this is, the more likely they have been exposed to a wider variety of tools and models to help support their decision-making. Each individual project manager will have learnt through practice, and so the greater their experience, the more opportunities they will have had to develop their understanding. Learning from failure can be just as important as learning from success, and it is this acquisition of knowledge, and the recognition that such experience adds to an individual's own bank of knowledge, which can form the deep smarts used to underpin quick and effective decision-making.

Decision-making can be driven by agreed process, and such a process is part of the organisational memory. However, process is generic, and decision-making is specific, and therefore the role of the project manager is to interpret the process in the context of the project. Feeding into the lessons log for future projects is considered to be just as important as withdrawing experience from the lessons log of previous projects. Such lessons can guide and inform us, but once again they need to be taken with consider of the overall context of the project.

The final identifiable phase in decision-making is about the impact of the decisions being made. Are the decisions even feasibility with the agreed scope of the project, or will they take the project outside of agreed boundaries set for time, cost and quality? How will the deliverables of the project be impacted upon by the decisions being made, and what knock-on effects will this have for the stakeholders involved?

Table 2 summarises these findings and presents them in the form of a framework which can be used by project practitioners when making decisions, to enable them to reflect if they have considered all of these aspects, if they have recognised and respected the influence of their own personal experiences, and if they have the confidence to make optimised decisions without succumbing to stakeholder power and influence?

Decision-Making Context	Decision-Making Methods	Decision-Making Process	Decision-Making Impact
Risk Appetite of Organisation	Education and Qualifications	Agreed Processes	Impact on Project Feasibility
Stakeholder Pressure	Learning Through Practice	Project Manager's Experience	Impact on Project Deliverables
Chain of Command	Knowledge Acquisition	Organisational Memory	Impact on Stakeholders

Table 2. Decision-Making Framework

Source: Authors' Own Work

7 Conclusion

This research study has investigated the role of decision-making within project management, and the issues and constraints which often apply. Whereas the common belief may be that decisions are made based upon facts and data, the reality is that too often decision-making is driven by stakeholders with power and influence. In such circumstances the optimal decision may not be made, and the most popular decision taken instead. Such decisions are often not in the interest of delivering project outputs, and relate to the skewed perspective of one stakeholder group over another. Other factors which heavily influence decision-making include the risk appetite of the organisation, with the risk adverse option often being the decision selected. Equally, seeking group decisions based upon a consensus too often ends in a decision upon which all can agree, opposed to the decision which is best for the project. The voice of reason in such circumstances is often the project manager, and therefore they need to be aware of the issues and pressures involved, and they need to have coping strategies in place to help them to manage such situations to ensure their decision-making is optimised.

How project managers undertake their decision-making is therefore of great significance. How much they rely on their personal experience (tacit knowledge) and theoretical understanding (explicit knowledge) is important, and recognising the role of deep smarts, i.e., the ability of project managers to make good judgement calls in new and unexplored situations, by bringing together personal understanding from unrelated previous experiences, forms an essential part of this understanding. Equally, reviewing organisational knowledge about previous projects, or similar situations, which are often stored in the form of lessons logs, can prove to be pivotal.

From this study, an original framework has been proposed which separates project management decision-making into four dimensions, these being context, methods, processes and impact. This framework can be used by project management practitioners to aid their decision-making, and to help them to find a natural balance between stakeholder pressure and project needs. Whilst this study has been focussed upon project managers operating within the UK, the findings derived are thought to be equally applicable to other countries which operate with similar formalised project management processes.

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