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Influencing culture related risks to improve project success

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Abstract— Advances in technologies have resulted in significant interest, projects and investment in associated infrastructure to transform how public and private organisations engage and interact with their stakeholders. However, the success of such projects is far from certain. Projects continue to fail in higher numbers than they succeed across multiple industries, no matter the type of project management methodology adopted. Project success is often focused on time, cost and quality. However, there is growing recognition that the dynamic interaction of multiple actors from diverse networks influences project success. Current project management methodologies may not sufficiently reflect the complex and dynamic nature of projects. This paper explores how actions to influence culture can contribute to project success. We explore this concept through the lens of actor-network theory (ANT) which was used to guide the collection of data and the data analysis.

Keywords— *Project management, culture change, project success factors, actor-network theory*

I. INTRODUCTION

According to Burga and Rezanian [1], effective project management aims to assist organisations successfully undertake and deliver small to large initiatives. Success has traditionally measured by criteria often referred to as the “iron triangle” of project management: time, cost and quality. This involves the time required to complete the project, delivering within agreed budget parameters, and achieving the expected quality of the outcome [2].

However, satisfying the iron triangle criteria may not ensure stakeholder satisfaction. Facilitating stakeholders’ transition from a current state to the post project desired state may require engagement and interaction with multiple internal and external networks. The interaction may involve communicating about the potential project risks and activities to mitigate them, skills development, new responsibilities of stakeholders and associated power allocations. Collectively, these culture influencing activities may contribute to effective project control and success [1].

Projects assist organisations transition from the current state to a desired state. Project management methodologies are commonly used to guide these projects. However, as previous studies have shown, even with the use of project

management methodologies many organisations find that projects success is elusive [3, 4]. An international sample of over 5,400 large information technology projects (defined as projects exceeding US\$15 million in cost) had more than US\$66 billion in cost overruns [4]. According to some estimates, the failure rate for technology implementations exceeds 60 per cent [5, 6], and rework to correct poor software development due to inadequate functional and business requirements exceeds more than US\$45 billion annually [7].

According to Pflügler, et al. [6], the rate of failure for technology focused initiatives has not significantly decreased in the past decade. Although the literature identifies a number of reasons for continued high levels of project failure, there is no consensus regarding resolution [8]. These failures have social and economic impacts and can negatively influence the organisation and people working within it [3, 6, 9].

The high failure rates may be due to myriad of complex sociotechnical reasons. This includes more allocating more attention to technical considerations instead of social impacts, inadequate leadership and management, and poor communication [8, 10-12].

According to Burga and Rezanian [1], Floricel, et al. [13] there is a shift in the academic literature, describing projects as multidimensional social process rather than merely an instrumental process. An example of this can be seen in the construction industry in where a social process is integrated with project management [14]. As part of this integration, cultural factors are considered through the creation of project alliances. Project alliances is considered a mode of integrated project delivery in which networks agree to collaborate, set aside self-interest, and accept joint responsibility for project errors and risks [8, 14].

This paper argues that planned, coordinated efforts to influence culture across networks involved and impacted by projects can contribute to a reduction in the number of projects that fail. However, it may require consideration of culture to be more prominent than currently presented in existing project management methodologies and frameworks.

Against this contextual backdrop, we address the following research question in this paper: “*Can integrating activities to influence culture within project frameworks reduce the risk of projects failing to meet stakeholder satisfaction*”. Our research is exploratory as there have been no studies to date that have used actor-network theory to examine the integration of culture within project management frameworks. We commence our paper by introducing the theoretical underpinning for the research (Section 2). Then, we present case studies focused on sample of communities in Western Australia, which provides a setting to examine our research question (Section 3). The results of our study are then presented (Section 4). We next discuss our results and identify the strengths and limitations of the research (Section 5) before submitting the paper's conclusions (Section 6).

II. LITERATURE REVIEW

A. Culture in project management as a basic concept

To guide organisations through the complexities of initiatives being project managed requires a commitment from leaders and managers to plan and undertake activities to influence culture from the current state to a desired state.

To help address these complexities, in the late 1980's the benefits of artificial intelligence (AI) were recognised as making the project management process easier and more thorough [15]. However, high failure rates of projects continued. Although AI can assist project management, it may actually increase the need for activities to mitigate culture related risk such as including activities to create a culture in which resistance to AI in project management is reduced [15].

We recognise culture is defined and considered by academics in a variety of ways [16-18]. These various definitions have common characteristics that include a relationship to history, shared traditions, and customs. According to Hofstede, et al. [19] the characteristics of culture are holistic, and influence individuals as well as groups of people. In this study, culture is defined as the attitudes, beliefs, practices, values, shared identities, rituals, customs that distinguishes the group and members of the group from others [20]. Culture is difficult to change, difficult to measure and classify; and can be embedded into artefacts [16, 17].

This paper considers culture from two perspectives: organisational culture, which has a stronger emphasis on practices within organisations, and the culture within communities where people live, which has a stronger focus on values [16, 19, 21]. The differences between organisational and community culture are related to values and practices. A person's core values are acquired from their community and embedded within them during their youth [16, 19, 21]. According to Alvesson and Sveningsson [16] the culture of the organisation can influence the values of a person, however, the likelihood of their core values changing in a significant manner are considered low. Conversely, a person can learn new practices, rituals, and

customs that help them, and others identify them with their workplaces. This is supported by the view that “culture is habitual behaviour but this characteristic does not mean it cannot alter or evolve over time” [22].

Project leaders and managers should consider the need for culture change within networks that will be influenced by projects and undertake activities to facilitate such change [16]. Within organisations are networks that include the executive team, corporate services, information technology, business operations, and sales and marketing. These networks interact with one another to deliver products and/or services to customers. Each of these networks may have differing roles, perspectives, and cultures [16].

An example of networks interacting to consider and act on influencing culture is emerging trend within the construction industry referred to as project alliances. Project alliances increase instances of project success by considering cultural factors as part of integrated project delivery [14].

In successful, complex initiatives, the actions of leaders and managers develop the culture, the expertise, and change the way actors and networks interact. Furthermore, as AI, automation, robotics, and other digital technologies evolve and become more mainstream, there are opportunities transform governance, thus allowing opportunities for more efficient delivery of products and services [23, 24]. To foster these changes, organisational leadership and management develop and implement strategies and identify the actors and networks to advance them [25]. These changes are often resisted, and not initially embraced [26-28]. The literature describes reasons for this resistance, including organisations' leaders and managers providing little clarity about how to achieve a change in culture and neglecting to encourage and support knowledge sharing across multidisciplinary teams [22].

Although studies indicate the level project failure is excessive, widely used project management methods and standards such as the Project Management Body of Knowledge (PMBOK) and Projects in Controlled Environments (PRINCE2) remain focused on premise that time, cost and quality [2] are fundamental to project success.

The enhancement of sociotechnical projects' effectiveness can be achieved by incorporating a more comprehensive range of risks that may typically be included within existing project management frameworks and methodologies [29]. Furthermore, project success can be influenced by the careful examination of the interplay among risks associated with leadership and management, culture, process, and technology networks. The authors aim to explore each of these networks individually in separate papers and subsequently integrate these perspectives into a comprehensive study. The primary focus of this paper are risks associated with the culture network.

To contribute effectively to project success, risks are initially identified and categorised as either strategic or operational risks. Strategic risks influence operational

networks and culture is considered a strategic network. These risks are incorporated into project management activities and prioritised based on their potential long-term and short-term consequences. This prioritisation takes into consideration various factors, such as historical data, expert opinions, agreed benchmarks, severity assessments and the risk tolerance of the organisation. High-risk elements are monitored, and mitigation measures are implemented to reduce the risk.

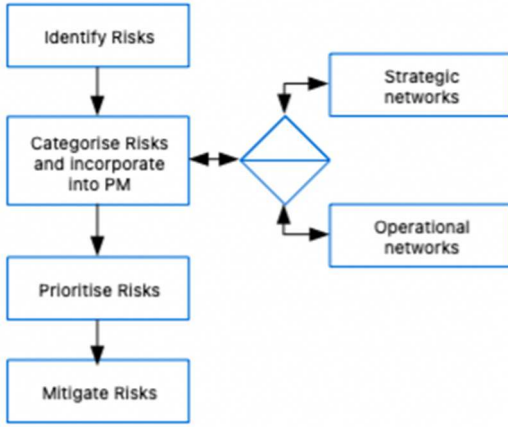


Fig. 1. Flowchart of project risk identification and mitigation.

B. Actor-network theory

Actor-network theory (ANT) was selected as a suitable research framework as it enables consideration and examination of dynamic, iterative and socially constructed phenomenon and how they interact [30, 31]. The use of ANT in project management provides a more reflective of the complex perspectives, including the dynamic interaction and the transformation of networks involved as projects evolve. According to Callon [32], ANT aligns well with identifying and tracing association between project human and non-human actors and processes.

A benefit of ANT is its ability to consider and analyse iterations, or changes to a project as it progresses from the concept stage, to the development and completion stages [10].

Within the ANT framework, the relationships between the actants (e.g., human and non-human processes) and their respective networks interact with the purpose of resolving conflicts and promoting stability [31-33].

There are four stages of ANT: problemisation, interassessment, enrolment and mobilisation. From an operational perspective, these stages overlap instead of operating in a sequential manner.

Stage	Description
Problemisation	The initial stage in project management where relationships are initially defined and charters are established.
Interassessment	The stage in project management where operationally the project exists and relationships among actors are dynamic in their enactment of accountability.
Enrolment	In the project management context (Callon,1986) enrolment is the stage when relationships are translated successfully by actors through the use of power.
Mobilisation	The methods are generalised and able to be mobilised or translated for use in other similar projects.

It is important to note that ANT is not primarily focused on the study of social networks but rather on actors' interpretations and translations of a project as it evolves through the various stages from conception to integration. Within actants, there exists an actor-network that determines how the actor translates activities, influences its engagement, interaction, and involvement with other actors.

We expect to see that projects will follow stages described by Callon (1986). During these stages project expectations are translated through well-defined organisational governance documents including risk registers and project management methods and standards such as the PMBOK and PRINCE2. Relationships between actors and networks evolve through the project stages. We anticipate that ANT provides a framework to study and verify how culture and other strategic and operational networks are embedded and contribute towards project progress.

III. RESEARCH METHODOLOGY AND BACKGROUND

The essence of this paper is the study of the ways in which five community organisations, based in five different Western Australian (WA) local government areas utilise digital technologies as a primary means of engaging with residents and to support and extend the residents' knowledge of their local communities. The five community organisations are categorised as social enterprise, community enterprise, and local government.

This study examines how the identification, management and mitigation of risks related to culture influence and contribute to project success. It investigates the potential opportunities and limitations of models and frameworks for transforming how five WA community organisations engage with residents and manage their knowledge through digital technologies.

Considered was given to how culture related activities were incorporated in the models and frameworks used to help guide the transformation of community engagement and interaction with residents through digital technologies. This includes addressing the potential consequences when insufficient consideration is given to activities that influence culture, which may contribute to the high failure rate of

TABLE I. ACTOR-NETWORK THEORY STAGES AND DESCRIPTIONS.

initial efforts to transform community engagement and the associated knowledge management process.

C. Methodology

This study is an exploratory, qualitative design, in keeping with the emerging nature of knowledge development in this area. A key consideration in integrating community and digital technology is whether the integration can result in sustained change and development across a variety of social, economic, and political networks within a community. To understand how changes have evolved, and the extent of their durability, the study incorporates a longitudinal study of comparative cases. The inductive study design enables divergent experiences to be documented at each site. This approach will offer insights into the extent to which local context is important and identify common elements across the participating organisations. The longitudinal aspect of this study enables the researcher to examine the evolution of the sociotechnical integration over time and its influence on how organisations use digital technologies to interact with community residents. The findings of the comparative cases will indicate the similarities or differences of integration approaches and their effects.

D. ANT as a method

As a method, ANT studies follow actors and observe network creators through whose perspective they attempt to interpret the process of network development.

A review of the data collected from primary and secondary sources suggested that ANT was a useful theoretical lens and method for analysing, interpreting, and explaining the data gathered from the organisations. ANT has also been applied as a method to identify reasons for projects failing in organisations and then used to guide their recovery (Pollack et al., 2013). ANT was adopted because community organisations that participated in this study engaged with residents in a relationship based sociotechnical activity, in which people, text, devices, and infrastructures take the form of interdependent networks. ANT focuses on tracing intricate networks and their associations with human and non-human networks (Doolin and Lowe, 2002).

ANT has been used in other studies to analyse, describe and guide complex projects, foster changes to organisation practice and behaviour through the use digital technologies (Linde and Linderoth, 2006), and assist people to recognise then consider the consequences of intended or not intended actions and unpredictable behaviour related to digital transformation projects (Pollack et al., 2013; Sage, Dainty, and Brookes, 2011). These ANT concepts align well to the needs identified in this study.

The types of projects that have applied ANT include information system projects, infrastructure projects, and organisational change initiatives [34]. ANT aids in examining the complex network of actors involved in these projects and understanding how they interact and influence each other.

The contribution of ANT to the success of sociotechnical projects is a subject of debate and interpretation. Some proponents argue that ANT provides a valuable framework for analyzing and mapping the diverse networks relating to leadership and management, culture (the focus of this paper), processes and technology and their mutual project relationships, which can help identify potential risks, dependencies, and sources of power [35]. This paper supports the view that by understanding these dynamics, project managers and stakeholders can better identify, categorise, prioritise and mitigate risks thereby enhancing opportunities for project success.

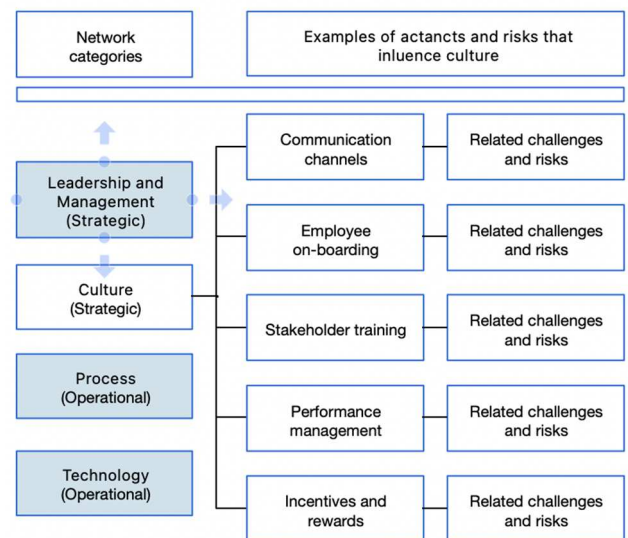


Fig. 2. Flowchart of project risk identification and mitigation.

It is important to note that ANT does not offer a prescriptive approach or guideline for project management. Its focus lies on understanding the influence of human and non-human actors on projects. However, when aligned and possibly integrated with practical project management methodologies, ANT may help reduced the high failure rate of projects.

The recognition of ANT's contribution to project success varies depending on the stakeholders involved and their familiarity with the theory [36]. In some cases, project managers and researchers have found value in using ANT to analyze and understand the complex sociotechnical dynamics at play. However, due to ANT's theoretical and abstract nature, it may be perceived as less relevant to project management practitioners who are more focused on practical project management considerations such as time, cost and quality.

This research aims to contribute to project management by assisting in synthesising the complexities surrounding the interdependence of the human and non-human actors in influencing culture and guiding projects. The actions undertaken hope to foster changes to organisational practice and behaviours to contribute to the successful transition from the current state to a desired state.

E. Data Sources

Data sources for this study included primary and secondary sources. The primary source of data was semi-structured interviews. These interviews were conducted to gain a better understanding of the opinions, behaviours and experiences of participants involved in strategic and/or operational activities related to using digital technology as part of the community consultative process.

Secondary sources included academic articles, annual reports and other government reports and publications, research reports, news reports and commentary, magazine articles, websites, podcasts and social media. The use of secondary data sources allowed this research to consider theories in a broader context and contribute to strengthening reliability and validity of existing theories (Bowler, Julien, and Haddon, 2018). Specifically, these sources provided insights into current and proposed consultative activities, plans and strategies of respective organisations' digital and face-to-face interaction with their community members.

TABLE 2. DATA TYPES, SOURCES AND PURPOSE.

Data type	Data source	Purpose / information collected	Data links to research
Primary	Interviews	How participants perceive the world, experience with their organisations past, present and future community projects.	Opportunity to understand and explore opinions, participants behaviours and experiences
Secondary	Annual reports, government reports and documents	Information about the leadership and management through organisational vision, mission, strategic initiatives, emerging operational focus.	Background information, chronology of events, key developments and accounts of events
Secondary	Websites and social media	Organisational operational insights	Background information and to provide links to past and contemporary development. Provides a link to news and other online resources

IV. RESULTS

Across the five communities that participated in the study, the activities aimed at influencing culture to support project success appeared to be more organic transformations rather than a planned, structured changes. While all five communities recognised the importance of communication

among actors and networks, only one community had a formal plan in place to sustain structured processes to keep networks informed of project progress and benefits achieved. Consequently, there was little evidence of intentional efforts by human and non-human actors to advance the project vision, or strategic plans, or incorporate substantial culture change activities within the projects. None of the five communities shared their knowledge or the experience they gained from the projects. Similarly, there was no specific framework or business model to facilitate activities to reduce the risk associated with resistance to change.

As a result, community engagement and associated knowledge management activities continued to evolve organically. These implications can influence the allocation of resources to the initiative, the speed of adoption, the ability to gain support of stakeholders, and formation of deeper alliances that can support community engagement and community knowledge management activities. Such alliances may contribute to expertise and knowledge to enrich community engagement, influence residents, and enhance community knowledge.

These results are beyond the realm of traditional project managers, project management methods and frameworks. The traditional role of the project manager consists of ensuring that the project is completed successfully, on time, and within budget, while also managing stakeholder expectations and maintaining a positive project team dynamic. However, the project could benefit from the ability to monitor and influence culture.

V. DISCUSSION

The need to influence culture, as described throughout the transformative journey, is translated through actors in a socially constructed environment. The use of ANT helps identify networks, relationships between networks and translating actors through which culture related risks are identified, and accountabilities are shaped to influence and contribute to projects success.

ANT, as described by Callon [32] and summarised by Floricel, et al. [13], includes the stages of problematisation, interestment, enrolment and mobilisation. Each stage overlaps and interacts with each other, while each actor and network operate differently with a common goal of successful project delivery. During the problematisation stage actors are engaged through translating actants such as a project charter and/or a project scope. During interestment, deliberations between actors and through translating actants roles are accountabilities are refined, the power of leaders and managers are used to influence culture related activities. During the enrolment stage the power is applied across multiple networks to transform from the current state to the desired state. Finally, through mobilisation, the project is operational, and lessons gained can assist other initiatives.

However, traditional project management methods, when viewed through the lens and the stages of ANT, may

not sufficiently consider the culture related risks that can improve chances of successful project outcomes.

For project success, culture related risks need to be identified, prioritised and addressed to bridge the gap between the current situation and the desired situation. These risks may include those related to competencies, skill development, communication, engagement, interaction and other activities that influence culture. The use of ANT can assist in the identifying these risks, creating actions to mitigate them, and monitoring their progress. To ensure project success and sustainability, mitigating culture related risks may require the introduction of new artefacts, new actors, and networks to redefine, transition and operate the proposed solution [37].

VI. CONCLUSION

Although there is awareness that activities that influence culture can influence the success of projects [38], the identification and mitigation of culture related risks have yet to be sufficiently incorporated within project management methods and frameworks.

Considering projects through the lens of ANT provides an opportunity to identify and align multidisciplinary actors and networks, their criteria, and perspectives of project success. Understanding this sociotechnical challenge and taking steps to mitigate these risks can significantly influence project success.

Traditional project management methods often focus solely on the project outcomes and may not sufficiently include the risks that influence those outcomes. Without identifying and addressing these risks, they can contribute to project failure. One such risk is not adequately considering and influencing culture associated with the project. This risk may be mitigated by better alignment of the sociotechnical aspects of the project. For example, identifying and mitigating risk associated with the gap between current competencies and the need for new knowledge and skills should be incorporated into project plans. The use of ANT can assist in creating actions that foster a shared understanding of this critical success factor. This may include introducing new artefacts, actors, and networks to mitigate the culture related risk.

The objective of this article has been to explore how activities to identify and mitigate risks related to culture influence project success through the lens of ANT. Furthermore, the paper suggests that including activities to capture and mitigate culture related risks could prove useful in increasing project success.

A. Theoretical contributions

Much is known about the reasons that projects failure, and it is recognised that existing project management methods and frameworks do not adequately address these causes. However, the solutions to reduce the high failure rate remain elusive. The importance of this study lies in its contribution to reduce the high rate of project failure by aligning culture as a risk factor in a way that complements

existing project management methods and frameworks. Mitigating these risks contribute to reducing the high failure rate of projects.

This study contributes to the literature on project management, particularly in understanding how culture influence the success of projects in two significant ways. First, it offers an informed description of how culture influence strategic factors such as project governance, accountability, activities that influence operational activities related to processes and technologies. Secondly, it provides an informed understanding of culture change is enacted in across multiple networks to contribute to project success.

This study supports the view that consideration of culture can support project success. Sustained actions to influence culture across multiple networks are crucial for the successful delivery of projects. The analysis of the longitudinal study reveals that influencing project culture is not conceptualised in the project management literature and requires more consideration and accountability from actors and networks. Activities to influence these actors and networks are often beyond the responsibility of the project manager.

The study demonstrates that project actions to influence culture was often undertaken in an ad hoc manner or without deliberate design. As the project progresses culture related plans and actions can evolve to address risks of various networks. This results in efforts to create a stabilised environment through the collaboration of multiple and diverse human and non-human networks and artifacts to influence, gain support for, and contribute to the project. From an ANT perspective the project becomes a collective social activity through which translation of being accountable is determined by actor networks. To achieve and progress the project leadership and management should be conceptualised as a collaborative activity not just having accountability vested in the project manager and project owner.

B. Limitations and further research

A limitation is the focus on the culture related networks and activities. Other networks that influence project success such as leadership and management, process, and technology networks will be the subject of additional papers. By identifying, monitoring, managing, and mitigating the risks associated with these networks, it is believed opportunities for project success can be increased.

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