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Citation: Usher, G. & Whitty, S.J. 2017. Project Management Yinyang: Coupling project success and client satisfaction. *Project Management Research and Practice*, Article ID 5523. <http://dx.doi.org/10.5130/pmmp.v4i0.5523>

ISSN 2207-1415 | Published by UTS ePRESS | <http://pmmp.epress.lib.uts.au>

RESEARCH ARTICLE

Project Management Yinyang: Coupling project success and client satisfaction

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DOI: <http://dx.doi.org/10.5130/pmmp.v4i0.5523>

Article History: Received 04/02/2017; Revised 07/03/2017; Accepted 17/03/2017; Published 01/06/2017

1.0 Introduction

Our research applies paradox theory to a project management construct to help project management researchers and practitioners understand the tensions that can exist between project success and client satisfaction. Our research highlights that although project success and client satisfaction are both present within a project management construct, they also belong to different functional systems (Luhmann:1995). Project success and client satisfaction have different systemic-discourses and use different language games to convey information (Wittgenstein:2010, Seidl:2006). These distinctions can create latent and sometimes salient tensions within the project management construct (Putnam et al.:2016) that project managers must understand, embrace, and work with.

Project management researchers are already aware of a duality that exists between the success of a project and the project participant's sense of satisfaction with the same projects (Rad:2003, Liu and Walker:1998). The former assessment is made in reference to predetermined quantitative metrics, whilst the latter is assessed against a range of qualitative and necessarily subjective measurements (Liu and Walker:1998, Lipovetsky et al.:1997). The former is based on a positivist epistemology that necessarily requires quantitative data (external to all participants) to determine whether the project is a 'success'; the latter is based on an interpretivist epistemology and assesses 'satisfaction' based on how well a project's outcomes meet the perception of value that the project participants have internally assigned to them (Dvir and Lechler:2004, Liu and Walker:1998, Liu and Leung:2002, Leung and Liu:1998).

DECLARATION OF CONFLICTING INTEREST The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. **FUNDING** The author(s) received no financial support for the research, authorship, and/or publication of this article.

Both the positivist concept of success and the interpretivist concept of satisfaction are well documented. However, in terms of the project management construct, there remains a recognised but not completely understood structural-coupling between them. We believe there is a gap in the current body of knowledge to adequately explain the integration between these two concepts within the project management construct. We have used a Grounded Theory (GT) methodology to explore the lived experience of project managers, and from this have identified a phenomenon which we have termed project management yinyang.

Project management yinyang is the state that exists when both project success and Client satisfaction are tightly coupled within the project management construct. Project management yinyang highlights that these two phenomena cannot be viewed as separate elements because the 'seed' of each exists within the other. And to truly achieve one, you must also achieve the other.

Our findings indicate that in order to create project management yinyang the project manager must embrace a paradoxical yet holistic philosophy. They must understand the complementarity, interdependency, and structural coupling that exists between the positivist and interpretivist paradigms within the project management construct. They must understand how satisfaction (Yin) and success (Yang) are created through focus. Furthermore, they must understand how project management yinyang is separate from, but borne from, the convergence of the other two elements.

2.0 Background and contiguous literature

2.1 YINYANG

Yinyang theory is a fundamental principle in Taoism (Bai and Roberts:2011). Taoism emphasises a holistic study of the universe and provides a strategy for dialectic investigation of all subjects (Bai:2008, Feng:2004, Zhang:1992). Yinyang is an all-encompassing yet flexible concept that can be adapted to any phenomena (Chen et al.:2010). Forke (1925) highlights that yin and yang mean nothing in themselves. It is only when they are utilised to express a particular relationship that they take on meaning. Hence, yin and yang only become meaningful within a specific temporal construct and when used to express a specific relationship (Wang:2013).

Yinyang is the phenomena that exists only in the union of both yin and yang. Yin is dark and represents the feminine. It is subjective and intuitive. Yang is light and represents the masculine. It is objective and rational (Jenkins:2002). Yin and yang are separate and discrete elements which occupy their own space and definable reality (e Cunha et al.:2002). However, when they operate in unison they create a third completely distinct force - yinyang. This union and the creation of a third force is referenced in chapter 42 of the Taoist sacred text (Tao te Ching), which states:

“...One gives birth to Two

Two give birth to Three...”

Tao te Ching chapter 42

In Western culture the theory of yinyang is often used to represent the concepts of harmony and balance (Wang:2013) and is most recognisable through its graphic representation the Taijitu (Figure 1).

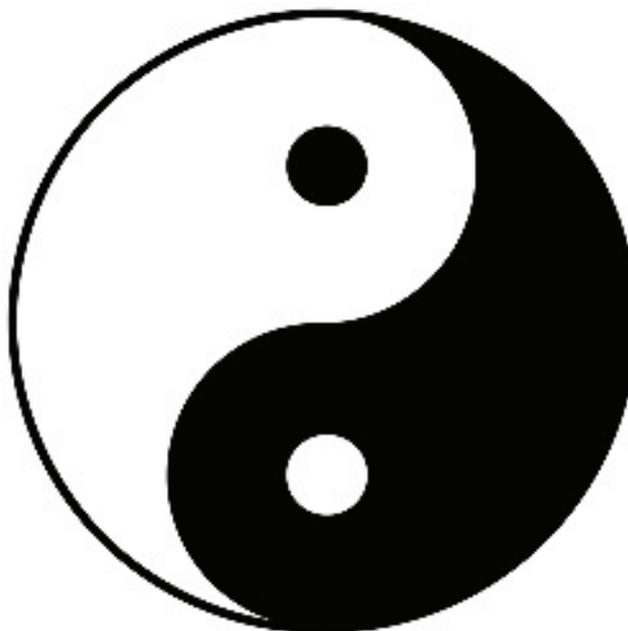


Figure 1 Taijitu (yinyang symbol)

However, to simply state that yinyang theory is about harmony and balance is to miss the complexities and subtleties of this philosophy (e Cunha et al.:2002). In doing so we miss the potential that it contains in helping to understand the current project management construct.

Yinyang depicts the duality that exists in all phenomena (Studies:2009). Yinyang represents clarity, as there is no grey in yinyang (Studies:2009). Each force is clear and defined, having its own strengths and weaknesses which are complemented by the other (Chen et al.:2010). However, at the core of each element is the 'seed' of its counterpoint (Symbols:2014) highlighting the connectivity and interdependency that exists between the two elements.

Yinyang conveys the existence of five different relationships. These are *Opposition and Contradiction* [Maodun] through which the dynamic energy is created; *Interdependence* [Xiangyi] highlighting that one cannot exist without the other; *Interaction and Resonance* [Jiaogan] through which each element influences and shapes its counterpart; *Complementarity and Mutual Support* [Hubu] through which each element provides what the other lacks; and *Change and Transformation* [Zhuanhua] through which each becomes the other in an endless cycle of dynamic flow (Wang:2013).

We intend to apply this philosophy to project management using a paradox theory and systemic discourses framework. Through this framework we will demonstrate how the dualistic elements of Satisfaction (Yin) and Success (Yang) coexist interdependently within the project management construct to create a third discrete phenomenon, which we term project management yinyang.

2.2 PARADOX THEORY, SYSTEMIC DISCOURSES AND STRUCTURAL COUPLING

Competing demands are inherent within any organisation or system due to the limited availability of resources such as time, money and personnel. These competing demands create tensions (Smith and Tracey:2016, North and Fiske:2016, Kistruck et al.:2016). The existence of these tensions has become so prevalent in modern organisations that Ashcraft

and Trethewey (2004) have stated that dealing with the tensions created by paradox is the “new normal” for managers. Often these tensions are not immediately recognisable. They can lie dormant or latent within a system until some specific action or environmental factor gives them salience (Luhmann:2006, Smith and Tracey:2016).

Paradox theory provides a framework for understanding these latent and salient tensions within systems and provides strategies for managing them (Smith and Lewis:2011). Paradox theory highlights the importance of developing conceptual clarity to understand how tensions are created (Smith and Lewis:2011). This clarity is developed by establishing boundaries between the paradoxical elements so the distinctions are recognisable (Smith and Tracey:2016, Quinn and Cameron:1988). Once the boundaries and distinctions are clear, an integrative model for managing the paradox can be developed (Luhmann:2006, Seidl and Becker:2006, Smith and Lewis:2011).

Typically paradox theory research has focused on tensions that are created by contradictory elements that exist simultaneously within a system and persist over time (Lewis:2000). However, Sutherland and Smith (2011) have proposed that this definition be broadened to include elements that are not necessarily oppositional, but rather are conceptually distinct and interdependent. As Janssens and Steyaert (1999) and Putnam et al. (2016) have noted, it is dualism not contradiction that lies at the heart of paradox relationships. And these dualisms can be treated as interdependent and compatible rather than just conflicting and separate. For the purpose of our paper we have adopted Sutherland and Smith’s (2011) definition of paradox. We view success and satisfaction as two paradoxical phenomena within a project management construct. Phenomena which are conceptually distinct but still interdependent and compatible.

One of the benefits of drawing a distinction between paradoxical phenomena within a system is that it allows observers to understand how the systemic-discourse of each phenomenon differs from its counterpart (Seidl:2006). Understanding the underlying systemic-discourse of different phenomena within a system is crucial, as many of the latent tensions within a system exist at the boundaries and intersections of these discourses (Luhmann:2006).

In expounding the theory of systemic-discourse, Luhmann (2006) highlights how the paradoxical boundaries can be identified by examining the different functional systems at work within the meta-system. These different functional systems use different codes and logics to derive meaning and value. For example, Luhmann (2006) notes how a scientific system assesses the validity of information using a binary system of either true or false; whereas an economic system assesses an outcome as either satisfactory or dissatisfactory based on whether the value of the outcome exceeds the value of resources necessary to generate it.

Where a system only draws upon a single functional systems it is internally consistent as it self-references its own internal logic and code. Therefore no tension can exist (Luhmann:2006). However, when two or more functional systems coexist within a meta-system, tensions will be created as these systems attempt to communicate with one another using their own specific language-game (Luhmann:1995, Wittgenstein:2010, Lyotard:1983). Language-games create tensions between systems because although these systems might appear to be communicating about a common issue, they are using fundamentally different codes and logics (language) to make sense of their world (Luhmann:2006), and these different languages are “... ruled by different regimes, untranslatable into the other ...” (Lyotard: 1993, p. 200).

Because it is impossible for different functional systems to communicate directly with each other (Wittgenstein:2010, Luhmann:2006, Seidl and Becker:2006) a process of deconceptualisation and reconceptualization occurs at the boundaries and interfaces of these systems (Spee and Jarzabkowski:2011). This process is often confused by actors within each of the different functional system as communication. However, it is in fact a form of structural coupling (Seidl:2006) through which concepts from one functional system are broken down (deconceptualised) into packages of information that are recognizable within the second functional system. These packages of information are then consolidated within the new framework (reconceptualised) so value and meaning can be assigned to them.

Where a strong correlation between the deconceptualised and reconceptualised information occurs the system is said to be tightly-coupled. Conversely, where there a weak correlation between this information occurs the system is said to be loosely-coupled (Luhmann:1995) As we shall demonstrate later in this paper, the project management construct has one of these internal boundaries between the functional systems of success and satisfaction. These two functional systems often operate in parallel and stimulate one another through structural coupling. However, they are in fact two distinct functional systems which utilize two very different language games.

2.3 SUCCESS (YANG)

More often than not project management practitioners consider their projects to be successful when they can demonstrate quantifiable performance against metrics that have been predetermined at the outset of the project (Thomson:2011, Atkinson:1999). Traditionally, project managers have used the constraints of the Iron Triangle such as time, cost, and quality as the key metrics by which the success of their project is evaluated (Atkinson:1999, Winter and Szczepanek:2008, Thomson:2011). This reliance on predetermined performance metrics, the collection of quantifiable data to assess whether these metrics have been achieved, and the belief that success can be judged as an objective reality, belies the positivist epistemology of the traditional definition of success (Saunders et al.:2012, Edirisingha:2012).

The language-game associated with this definition of success indicates that it falls into Luhmann's (1995) scientific system. In this system, success is judged on the basis of true/false responses to whether predetermined performance metrics have been achieved.

Proponents of the positivist school of thought, also referred to as the "Factors School" (Söderlund:2011), have undertaken innumerable research activities to identify what criteria and factors, and what conditions and characteristics should be measured to help project managers achieve success. These studies have resulted in a plethora of new metrics beyond those of the traditional Iron Triangle, for project managers to assess in the hope of increasing the chances of success (Morris and Hough:1987, Morris:1994, Sayles and Chandler:1992, Pinto and Mantel:1990, Belassi and Tukel:1996, Cleland and King:1983, Locke:1984). The underlying assumption of this body of work is that success is a phenomenon that can be measured by gathering enough empirical data to provide descriptive statistics that cannot be 'logically' refuted, and therefore must rationally 'prove' the success or failure of the project (CII:2011, Söderlund:2011).

Despite new measurable criteria being available to project managers, the likelihood of achieving success under the positivist paradigm still remains elusive. The CHAOS report (Standish:2009) estimated that even with new and expanded measurement criteria, 24% of the projects they investigated were failing and a further 44% were challenged. The report also noted that these results "...represent the highest failure rate in over a decade..." (Standish:2009).

To the positivist, this disconnect between measurable metrics and success can be traced back to a failure in the criteria used to evaluate the project. As Stretton (2014) states, the continued failure of projects demonstrates “...an urgent and obvious need to develop comprehensive data on causes of project failures – preferably validated by appropriate and agreed criteria as to what constitutes success/failure...”.

Although the means to achieving success might appear relatively straightforward to those who view projects from the positivist perspective, other project management researchers have raised concerns as to whether the continual addition of objective performance criteria is the best developmental path for the profession. Atkinson (1999) states that the “...iron triangle rhetoric which has been followed over the last 50 years...may have resulted in a biased measurement of project management success. Creating an unrealistic view of the success rate...”.

Many researchers have noted the deficiencies that adopting a positivist epistemology can create within the context of project management. Specifically, this approach leads to a belief that universal standards for success can be developed (Nicholas:2004, Dewulf and Van Meel:2004). Others argue that the focus on these “explicit and measurable factors” (Dewulf and Van Meel:2004) result in project managers placing more focus on achieving tangible “critical success factors” (Dietrich and Lehtonen:2005, Cooke-Davies:2004, Liu and Walker:1998, Ribeiro et al.:2013) than on intangible project criteria, such as understanding the value perceptions which project participants have assigned to the project outcomes (Bryde and Robinson:2005, Thomson:2011).

The identification of these deficiencies has led to a new school of thought being explored by project management researchers. This new outlook challenges project managers to move beyond objectively assessable performance criteria that result in a scientific-based true/false language-game, and to start incorporating more intangible “human factors” into their assessment (Shenhar et al.:1997, Cooke-Davies:2004). This move to intangible human factors requires project managers to view the management of their projects from new perspectives and functional systems.

2.4 SATISFACTION (YIN)

One alternate epistemological perspective to positivism is that of interpretivism (Edirisingha:2012). An interpretivist paradigm within a project management context postulates that the idea of success, as defined by positivistic criteria, is not as important as the satisfaction ‘felt’ by the project participants at the completion of the project (Lipovetsky et al.:1997). We believe this paradigm displays the language-game of Luhmann’s (1995) economic system. In this paradigm project outcomes are assessed by how closely they align with the stakeholder’s expectations. Or put more simply, whether the stakeholders believe the project’s ‘pay-off’ was worth the effort.

Understanding the importance of satisfaction is relatively easy. However, defining and measuring satisfaction is infinitely more difficult (Lipovetsky et al.:1997, Kärnä:2014). This is because people assess the value of a project’s outcomes subjectively (Shenhar et al.:1997, Kärnä:2014, Barrett:2000). These assessments are based on emotional responses derived from the intangible value that project participants have assigned to these outcomes (Sanvido et al.:1992, Parfitt and Sanvido:1993).

Many researchers have noted that as the discipline of project management develops, there is an increasing understanding of the importance that perceptions and expectations have on the participant’s final evaluation of the project outcomes (Dalcher and Drevin:2003,

Turner:2014). These perceptions and expectations form the basis of their final assessment of whether they 'feel' satisfied with the final project outcomes (Wuellner:1990, Chan and Chan:2004).

Horowitz (2005) explains that modern project managers operate in an environment where even positivistically 'successful' projects can be considered failures if they do not to deliver what the stakeholders were expecting. Hoffman (2007) echoes these sentiments and states that while meeting deadlines and staying within budget may appear to be the most obvious challenges, managing the expectations of the project participants may be the greatest difficulty a project manager will face. Davis (2014) agrees, adding that in the 21st Century project managers will see more of a focus on satisfaction as a means of evaluating a project's final outcome.

This growing call amongst researchers for satisfaction to form a significant component in the determination of a project's ultimate value highlights the need for project managers to understand the undeniable link (i.e. structural coupling) between the interpretivist and the positivist epistemology within the project management construct.

As Yang and Peng (2008) have noted, the project participant's satisfaction with the project often includes a belief, perpetuated by the discipline of project management itself, that success should be objectively measured against time, cost and quality. This creates a coupled system through which the project's objective criteria (positivist assessment) can positively or negatively influence the project participant's level of satisfaction (subjective assessment).

The existence of this structural coupling highlights that project managers cannot truly separate project success from client satisfaction. These two phenomena cannot be isolated from each other and assessed independently. Although success and satisfaction are distinct systems, each utilizing its own language-game, they operate in parallel and are interdependent systems within the project management construct. So much so, that it could be argued that without success there cannot truly be satisfaction. And without satisfaction there cannot truly be success. Or as the philosophy of yinyang explains, the seed of each resides in the heart of the other. Therefore, any framework which project managers adopt to manage success and satisfaction must embrace this paradoxical relationship.

2.5 PROJECT MANAGEMENT YINYANG

Over the past two decades project management researchers have begun to focus on how the two epistemological standpoints of success and satisfaction complement each other within the project management construct. Researchers such as Pinto and Mantel (1990), Turner and Zolin (2012), Parfitt and Sanvido (1993) and Cooke-Davies (2004) have proposed the concept of '*project management success*' as a completely separate phenomenon to that of either success or satisfaction.

We found the concept of *project management success* to be problematic for two reasons. Firstly, as defined earlier in this paper, the concept of 'success' carries with it a particular epistemological perspective and language-game. Hence, to use this word to define a paradoxical relationship which requires the existence of both the positivist and interpretivist paradigms could create a bias in the understanding of the phenomenon itself.

Secondly, we found the concept of *project management success* was poorly defined within the literature. Some authors discuss project management success as the acceptable completion of the technical aspects of the project as evidenced by the traditional positivist metrics (Atkinson:1999, Stretton:2014). Others describe it as a 'second order' metric

Table 1 Project management yinyang

Relationship	Project Management Yinyang	
Phenomenon	Satisfaction	Success
Epistemology	Interpretivist	Positivist
Perspective	Subjective	Objective
Assessment criteria	Perceived value	Predetermined quantifiable metrics
Functional System	Economic	Scientific
Represented by	 Yin	 Yang

that includes a review of the project after it has been operational for a certain period of time (De Wit:1988). Others use project success and project management success almost interchangeably to describe a wide range of evaluation criteria including: measurement against strategic objectives (Cooke-Davies:2004, Jugdev and Mathur:2006, Killen et al.:2012); whether the final project outcomes work as expected (Karlsen et al.:2005); meeting project participant's expectations (Hoffman:2007); and meeting the psychological expectations of the project participant's in relation to interpersonal relationships (Chan and Chan:2004). Despite the inconsistencies that appear to exist within the project management literature about the concepts of success, satisfaction and the relationship that exists between them, it is clear that a differentiation between these three phenomena is justified (Shenhar et al.:1997, Cooke-Davies:2004).

For the purpose of this paper we elected to conceptualize these three discrete phenomena through the philosophical construct of yinyang. Within this construct satisfaction (Yin) is considered to be derived from an interpretivist epistemology which values the invisible, the intangible, the implicit and utilizes an economic language-game. Complementing this, success (Yang) is considered to be derived from a positivist epistemology which values the visible, the tangible, the explicit and utilizes a scientific language-game. From this understanding, this paper considers project management yinyang to be an integrative state that requires the duality of both phenomena to be present and influence each other. This duality is conceptualised in Table 1.

3.0 Research questions

This paper has already identified the need to create a distinction between the concepts of success (Yang), satisfaction (Yin) and project management yinyang. The literature reviewed in this paper demonstrates that there is a need for an integrative framework to help researchers and practitioners understand the paradoxical relationship that exists between these concepts as experienced and practiced in the project environment. From this foundation, a valid research question appears to be:

RQ: Could the philosophy of yinyang help project managers better understand the relationship that exists between success and satisfaction within the project management construct?

4.0 Research methodology

4.1 GROUNDED THEORY OVERVIEW

This research utilizes a Grounded Theory (GT) methodology. GT is a qualitative research method which attempts to develop novel frameworks by investigating social processes from the perspective of those who live them (Bryant and Charmaz:2007, Locke:2003). It is undertaken within a specific context and develops through a simultaneous and non-sequential process of data collection and analysis (Glaser and Strauss:1967, Locke:2003, Milliken:2010). GT research is an iterative process which cannot be formally planned in advance as it must remain flexible enough to react responsively to emergent themes (Wastell:2001). As the aim of our research is to conceptualize and develop abstract meaning from socially contextualized actions (Locke:2003), GT was considered the most appropriate research method.

Glaser and Strauss (1967) argue that any GT research project should commence with the identification of a particular social phenomenon or process. This phenomenon or process should be investigated through the simultaneous collection and analysis of data to allow categories to emerge naturally (Milliken:2010). Only once these categories have become evident from the field data should the researcher attempt to group these into key themes and properties, and attempt to articulate the relationships that exist between them (Milliken:2010, Locke:2003). The final stage in a GT method is a review of the background and contiguous literature to understand how the identified themes, properties and relationships interact with the current body of knowledge (Flipp:2014).

4.2 OVERVIEW OF GT APPLICATION TO THIS RESEARCH

We have applied the GT method to our research using a two-phase approach. We commenced with an identification process (Phase 1) which codified a particular social phenomenon within the project management construct. With these phenomena identified we purposively selected case studies which appeared to exhibit a clear demarcation between success and satisfaction. These case studies were analysed to help provide us with guidance on key categories for a more detailed investigation. The Phase 1 analysis identified three broad categories from within the data which provided parameters for our Phase 2 investigations.

The categories identified in Phase 1 were used to guide semi-structured interviews during the investigation process (Phase 2). The data collected through these interviews resulted in an additional four categories being identified. The seven categories were then subjected to a three-stage analysis, which resulted in these categories being classified as two themes and their associated properties. A flowchart of our methodology is included in Figure 2.

4.3 DETAILED RESEARCH METHODOLOGY

Our research took place over a six-month period and was conducted in two phases. Phase 1 commenced with the codification of a phenomenon observed by one of the authors who is a consulting project manager working in the Australian construction industry. The phenomenon was that the completion of a seemingly successful project did not always result in the project participant's feeling satisfied with the project outcomes. Based on this observation, we postulated that the phenomenon was the result of project participants using different assessment perspectives in their evaluation of the project outcomes.

To help us identify the elements for more detailed research, we purposively selected two recently completed projects as case studies. These case studies were specifically selected because

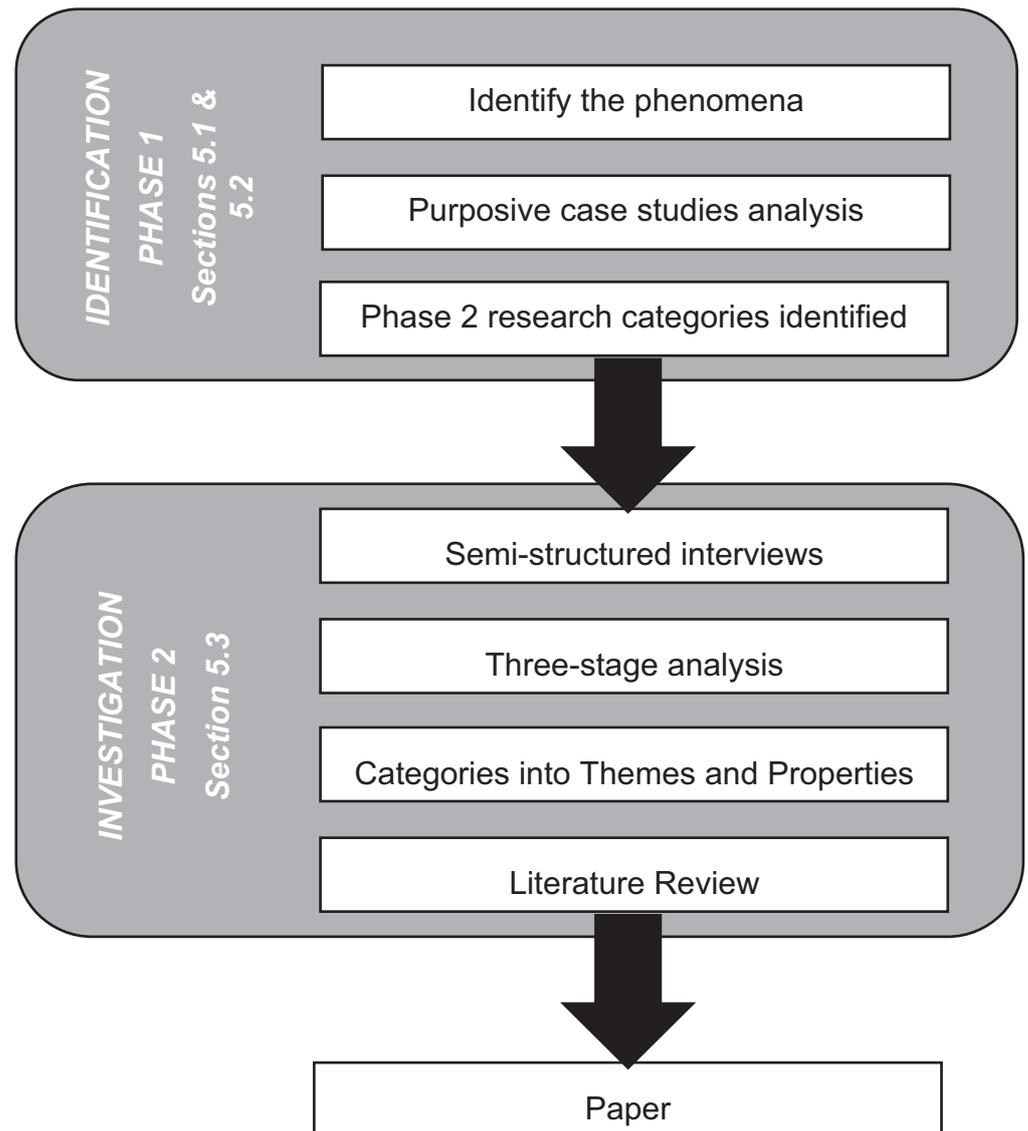


Figure 2 Overview of the Project Management yinyang GT methodology

they appeared to contain a clear demarcation between concepts of project success and client satisfaction. Using a targeted selection process like ours is not unusual in a GT methodology where the case studies can become an object of study in themselves (Patton:1990). Because we have purposively selected these cases, we consider them to fall into the “instrumental” classification noted by Stake (1994, 1995). We made a conscious decision to select two projects delivered by the same project manager as the subjects for the case studies. The rationale for this decision was to reduce variables that may have existed in the application of project management methodologies and the personal characteristics of the project manager.

The analysis of these case studies commenced with inductive category construction (Kuckartz:2014). This was achieved by paraphrasing and abstracting the salient points within the cases. Once identified, these were subjected to a comparative thematic analysis (Tuckett:2005) and consolidated into three generalized categories. These three categories became the key areas for our Phase 2 investigations. The categories identified through the case study analysis are noted in Table 2.

Table 2 Categories identified through the case study analysis

Case Study	Category
1	Duality Focus
2	Duality Multiple Expectations

Table 3 Project management yinyang: Categories and data collection method

Category	Data collection method
Duality	CS1, CS2, Interviews
Focus	CS1, CS2, Interviews
Multiple expectations	CS1, CS2, Interviews
Success	Interviews
Satisfaction	Interviews
Multiple pathways	Interviews
Funnelling	Interviews

Phase 2 of the research was conducted using semi-structured interviews from a theoretical sample of ten practicing consultant project managers. The interview participants were all male with between five and ten years' experience as project management practitioners. At the time of conducting our interviews, all of the participants were managing multiple projects within the Australian construction sector. Their clients included eight government departments or agencies (Federal and State), four institutions (education and health), and six private organisations (data centres, retail, residential and industrial). The interviews were digitally recorded and transcribed into Nvivo for data analysis. The recordings, transcripts and associated data analysis are retained on a password protected computer. To protect their privacy, interviewees were assigned a re-identifiable code (PM01-PM10) during the transcription process.

The analysis of the interview data was conducted using a three-stage approach (Algeo:2012). The first stage involved a process of open coding to identify emergent concepts from within the data (Flipp:2014, Glaser:2007, Bryant and Charmaz:2007). As a result of this open coding process, four additional categories were added to those identified through the case study analysis. This brought the total number of identified categories to seven. These categories are noted in Table 3.

The second stage of the analysis involved a process of axial coding. Through this process we classified the categories into themes and properties so that we could identify the basic elements of a theory to explain the phenomenon under investigation (Flipp:2014). Through this process the categories were consolidated into two themes and five associated properties. These themes and properties are identified in Table 4.

The final phase of analysis involved selective coding (Dey:2007). This process involved a review of the key themes and their properties to understand how they interrelated (Flipp:2014, Wastell:2001). Following this final analysis a review of the background and contiguous literature was undertaken to understand how the themes, properties and relationship interacted with the current body of literature (Milliken:2010).

Table 4 Project management yinyang: Themes and Properties

Theme	Properties
Duality	Success Satisfaction
Focus	Multiple Pathways Multiple expectations Funnelling

5.0 Data Collection and Analysis

5.1 CASE STUDY 1 [CS1]

This project was delivered for the Australian Department of Defence. The stated outcome of this project was the development of training area facilities to support new capabilities for seven discrete user groups. At the project's commencement the project manager confirmed the project budget (\$ 8 Million) and the required timeframe for delivery (18 months for design and construction) with the project sponsor's representative.

The project manager engaged directly with the user groups to determine their expectations in relation to the functional requirements of the facilities through an initial user requirements briefing and four separate design review workshops throughout the design development process. In the final month of the design process the project sponsor's representative was deployed to another position and a new project sponsor's representative was appointed.

After the completion of design, but prior to the commencement of construction, the new sponsor's representative advised all parties that the project budget had to be reduced to \$5.4 Million. Based on this new information the project manager undertook a scope reduction workshop with project sponsor and user group representatives, the design team, and the construction Contractor. The outcome of this workshop was a reduced project scope and an endorsed, prioritized, and costed list of scope items to be reintroduced into the project as risks were retired and contingency funds were released. The Contractor agreed to the reduced scope and the construction contracts were duly executed.

The physical construction of the facilities took 9 months. Throughout this process the project manager met with the project sponsor's and user group's representatives at least once a month to discuss the progress of the project. All variations were reviewed and approved by the sponsor's representative prior to being executed by the project manager. During construction the project manager worked collaboratively with the Contractor and the representatives of the sponsor and user group to implement the risk mitigation strategies necessary to reduce the contingency allocations. As the Works progressed and risk contingencies were retired, and the project manager was able to reintroduce three previously removed scope items from the endorsed scope list.

Two weeks prior to Practical Completion the original sponsor's representative was reintroduced to oversee the final delivery of the project. During his absence from the project the original sponsor's representative had no visibility of the project nor was he involved in any of the communication regarding scope reduction, risk mitigation strategies, and reintroduction of deliverables.

The project was completed 0.15% under the revised project budget. The Contractor was awarded Practical Completion two days prior to the revised date for Practical Completion. All identified defects were rectified and closed out within four months of reaching Practical Completion.

Three months after Practical Completion was achieved, the project manager facilitated a Post Occupancy Evaluation and Lessons Learnt workshop. This workshop was attended by the sponsor's and user group's representatives, design consultants, the Contractor and the project manager. At this meeting the sponsor's and user group's representatives commended the project manager and Contractor for completing the project on time and under budget, and advised they felt the project was successful and were generally satisfied with the project outcomes. However, the returned sponsor's representative expressed displeasure regarding the functionality and operability of the project deliverables due to the removal of scope items as a result of the reduced budget.

5.1.1 Analysis of Case Study 1

The open coding analysis of Case Study 1 [CS1] identified the following categories relevant to this research:

5.1.1.1 Duality

CS1 indicates the concurrent existence of both the positivist concept of success and the interpretivist concept of satisfaction within this project. The case study shows that metrics for success (positivist epistemology) were agreed at the commencement of the project (cost, time and functional requirements). These provided prescribed measurement criteria for determining the project success. The project participant's perceptions (interpretivist epistemology) regarding the project outcomes were captured during the user requirements briefing and subsequently confirmed during the design review workshops thereby providing a framework for understanding the expectations regarding the project outcomes.

The feedback received from the project participants at the Post Occupancy Evaluation and Lessons Learnt workshop regarding the 'success' of the project references the performance metrics as the evaluation criteria used. However, the objective 'success' of the project did not result in satisfaction with the project outcomes on behalf of the returned project sponsor's representative. This appears to indicate a duality within this project between the successful delivery of the project outcomes and this particular stakeholder's expectations of what the project was attempting to deliver. This duality indicates the existence of a paradoxical relationship.

5.1.1.2 Focus

The re-scoping workshop undertaken as a result of the reduction in project budget indicates that both the performance metrics (positivist assessment) and project participant's expectations (interpretivist assessment) changed throughout the project to address unforeseen challenges. The reduction in project budget and the subsequent scope contraction demonstrated in CS1 indicates that success cannot always be judged by reference to the originally agreed performance metrics.

CS1 appears to indicate that both the positivist-based success criteria and the stakeholder's expectations regarding the future project outcomes are flexible. CS1 demonstrates that external influences can impact on both objective and subjective assessment perspectives. These influences appear to create opportunities for project

participants who may view the project from either the positivist or interpretivist paradigm, to reassess their understanding of the emerging reality, and develop a clearer more focussed understanding of what the final project outcomes will actually be and what they can expect from them.

5.2 CASE STUDY 2 [CS2]

This project was undertaken for a not-for-profit service provider in Australia. The stated objective of this project was to prepare a business case for the development of a mixed-use, intergenerational, community-living precinct. The project manager was engaged to undertake scope definition through semi-structured interviews and group workshops, to procure the technical disciplines required to develop a master-plan, and to draft a business case for endorsement by the sponsor's governing body.

At the commencement of the project the project manager confirmed the project budget (\$ 0.35 Million) and the required timeframe for delivery (6 months for business case development and submission) with the project sponsor's representative.

To gain approval through the Organization's governance structure the project manager was required to obtain endorsement from five levels of governance with representatives from ten different departments. Many of the governance representatives had never been involved in a construction project before, other than residential construction. The representatives of these groups had wide-ranging expectations regarding the final outcomes of the project that affected the development of the business case. These expectations included differing opinions regarding what facilities should be included for assessment, the allocation of capital and operational costs in relation to those facilities, differences in project priorities, and disagreements regarding funding models.

The project manager engaged with each of the user and governance groups individually to gather and document their expectations in relation to the project outcomes. This information was consolidated into a user requirement matrix and provided to all user group and governance groups representatives. The project manager then facilitated a meeting with all the representatives and gained consensus from the combined group on each of the project requirements and how important each element was to the overall Organization. This process resulted in a fully-documented user requirements brief that outlined and prioritised all the stakeholder's expectations regarding the final project outcomes.

From the information in the user requirements brief, four master-planned options were developed and endorsed by the governance structure for inclusion in the final business case. Multiple funding options were explored for each master-planned option, and the associated financial hurdle rates were assessed. At the submission of the project deliverable, the project had run 18 weeks over the original forecast (75% over time) and had cost \$0.49 M (40% over budget).

At the presentation of the business case the Organization's representatives unanimously commended the project manager for successfully developing the business case, managing the complex stakeholder and governance environment, and mentoring the governance team. The stakeholders noted that they were extremely happy with the outcomes of the business case. As a result of their experience with this project, the not-for-profit Organization requested two more business case submissions for different development sites from the project manager, and engaged the project manager to oversee the Development Application process for the first stage of construction.

5.2.1 Analysis of Case Study 2

The open coding analysis of Case Study 2 [CS2] identified the following categories relevant to this research:

5.2.1.1 Duality

CS2 also indicates the concurrent existence of both the positivist concept of success and the interpretivist concept of satisfaction within this project. The project (business case) was required to achieve predetermined performance metrics in both time and cost, and the project participants had clear, although varied, expectations on what was to be delivered.

Based on the predetermined performance criteria this project was not a success. It was delivered well over budget and outside the originally agreed timeframe. Interestingly, this did not appear to affect the sense of satisfaction that the project participants' felt at the completion of the project as evidenced by their expressions of satisfaction and through the subsequent engagement of the project manager on additional projects. This indicates the existence of a paradoxical relationship, where the systems of success and satisfaction are loosely coupled.

5.2.1.2 Multiple expectations of project outcomes

CS2 indicates that the participant's expectation of the project's goals is not always unified. The project manager recognised this early in the project and utilised a process of detailed stakeholder engagement and consensus-building to consolidate the various expectations. This process allowed the project manager to focus the project participants' perception of what the project would deliver and create a framework for managing expectations.

5.3 PHASE 2: INTERVIEWS

Following the analysis of the case studies, semi-structured interviews were conducted with ten project management practitioners. The aim of these interviews was to help us gain a better understanding of the categories identified through the case study analysis.

5.3.1 Duality

5.3.1.1 Existence of Duality

The interviewees were asked whether they had ever completed a project that they thought was successful, but other project participants were not satisfied with the project's final outcome. Seven of the interviews confirmed that they had experienced this phenomenon. This appears to confirm the existence of a positivist/interpretivist duality, which can result in a loosely-coupled paradox within the project management construct.

5.3.1.2 Success

When asked why they felt the project was successful, 70% of the responses referenced some form of positivistic performance metrics as the basis for their assessment.

"...it's simply about time, cost and quality; and if you've come in on time, under budget and as per the approved plans ... then absolutely the project is a success..." (PM06)

However, PM06 made another interesting comment during his response.

"...If you've achieved those KPIs and the client is not satisfied, well then there's a disconnect somewhere between something in the project.... I don't think the client being unsatisfied automatically makes a project unsuccessful..." (PM06).

This comment highlights the duality of success and satisfaction within the project management construct. PM06 refers to positivistic measurements (KPIs) but also notes that these do not guarantee satisfaction. The use of the word ‘disconnect’ indicates the existence of a loose structural coupling within the project management construct. This comment appears to support our premise that a disconnect (imbalance) between the two elements is possible, and that this imbalance can disturb the project’s yinyang.

5.3.1.3 Satisfaction

The interviewees were asked why they felt some participants were dissatisfied with project outcomes that achieved the stated performance criteria.

“...it’s a subjective assessment, I sometimes think they aren’t sure why they are not happy... It’s just that they expected something but didn’t get it...” (PM02)

“...they don’t know the actual result they will get. They only know what they feel about what the actual result is going to be...and what that can bring to them is an emotional pride, celebration, achievement.... So if you’ve got the emotional thing wrong at the end, then you know that, actually, there was something along the line that they disagreed with ...whether it’s time, cost, quality, or risk, or whatever it might be... all you’re doing along the way is really just building confidence, and happiness, and awareness, and knowledge...so when they get to the end they say “Wow, look at this... it’s amazing”. (PM10)

We found the comments by PM10 particularly interesting. PM10 links the positivistic assessment criteria (Yang) of “...time, cost, quality, or risk...” to the interpretivistic evaluation criteria (Yin) of “...confidence, and happiness...” which, once again, indicates a structural coupling between these systems. This would appear to support the premise that the ‘seed’ of each system is contained within the other, and would therefore support the existence of the philosophy of yinyang within the project management construct.

5.3.2 Focus

5.3.2.1 Multiple pathways

The interviewees were asked whether they felt that, at the commencement of the project, there was only one possible outcome available to meet the performance metrics established. All of the interviewees believed that there was more than one possible way to achieve the project outcomes in accordance with the established performance metrics. PM02 noted that the emergent nature of projects dictated that multiple pathways need to be considered in reaching the final project outcome.

“...things change.... you’ve got to build in flexibility so that, over the project, you’ve got an opportunity to shuffle around or adjust stuff...” (PM02)

The concept of an emergent pathway is closely aligned with yinyang relationships of *Jiaogan* (Interaction and Resonance) and *Zhuanhua* (Change and Transformation). The emergent nature of the project management construct creates a need for the functional systems of both success and satisfaction to remain fluid so that they can interact, resonate, change and adapt to the influences which impact on the project.

5.3.2.2 Multiple expectations

In reference to the concept of satisfaction, the research participants were asked whether their clients consisted of a single entity or multiple stakeholders. When all the interviewees advised

that their clients consisted of multiple stakeholders, they were asked whether they felt the stakeholders had a common perception of the project's final outcomes.

"... Oh God no! absolutely not... if there is any commonality it will be based on any technical briefings that have been given, so they would all expect that they will get a restaurant... but in their heads I guarantee that everyone sees a different picture of that restaurant..." (PM05)

"...No, they all have quite different understandings and it's all dependent on their own experiences, and backgrounds and what their key areas [in the Organization] are..." (PM04)

We found these responses interesting as they indicated the existence of the Maodun (Opposition and Contradiction). Paradoxically however, they concurrently indicated the existence Hubu (Complementarity and Mutual Support) in that multiple disparate expectations could be brought together or focussed on a single final outcome that all parties could be satisfied with.

5.3.2.3 Funnelling

The interviewees were then asked how they transitioned from multiple possible outcomes based on performance metrics and multiple expectations, to a single final project outcome. Many of the interviewees describe a process of 'funnelling'.

"...you've got to narrow your focus...you've got to define the funnel to make sure the project ends up a point inside that funnel that matches what they [project participants] are thinking they are getting...that's the real job [as a project manager]..." (PM08)

When describing their role as project managers both PM05 and PM10 made a funnel motion with their hands.

"...you keep narrowing down the options until you all know what you are trying to deliver..." (PM05)

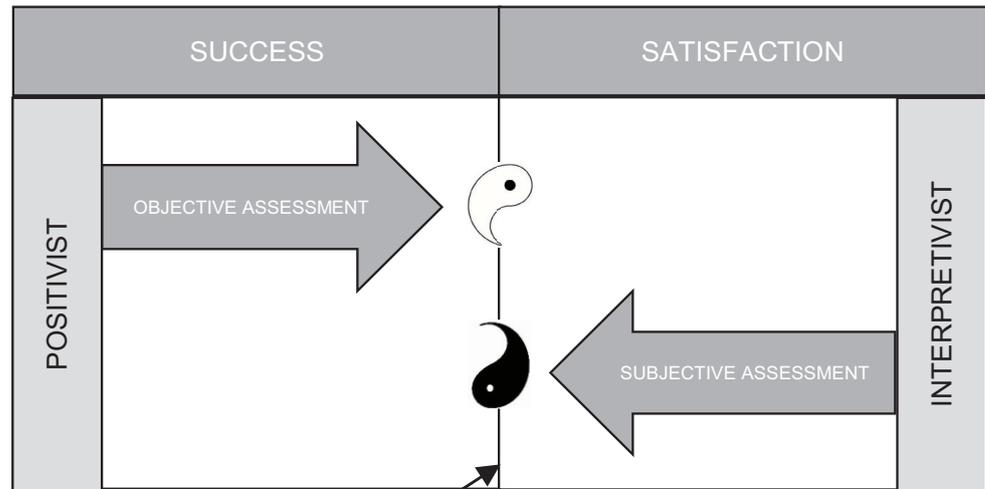
"...you've got to guide and lead them [project participants] to where you are headed..." (PM10)

This concept of funnelling appeared to be a function of the Hubu (Complementarity and Mutual Support) which we noticed while discussing the both the multiple pathways (success criteria) and the multiple expectations (satisfaction criteria). In addition, this concept of funnelling appears to be one of the processes that the interviewees used when trying to address the Zhuanhua (Change and Transformation) evidenced in the comments regarding the multiple pathways, and the Maodun (Opposition and Contradiction) evidenced in the comments regarding multiple expectations.

6.0 Discussion

6.1 THEME 1: DUALITY

Our data indicates project participants assess projects from different paradoxical perspectives. The existence of this duality guided us to conceptualise the delivery of a project differently to the traditional linear approach. Rather than adopting an approach where the project has a single start point we conceptualized a framework in which the project's final outcome is being approached from two separate starting points. The first starting position is a positivist epistemology, the other is an interpretivist epistemology. From these two starting position, both the positivistic and the interpretivistic assessment of the project moves concurrently towards the project's final outcome.



Project's final outcome
 Figure 3 Yinyang framework

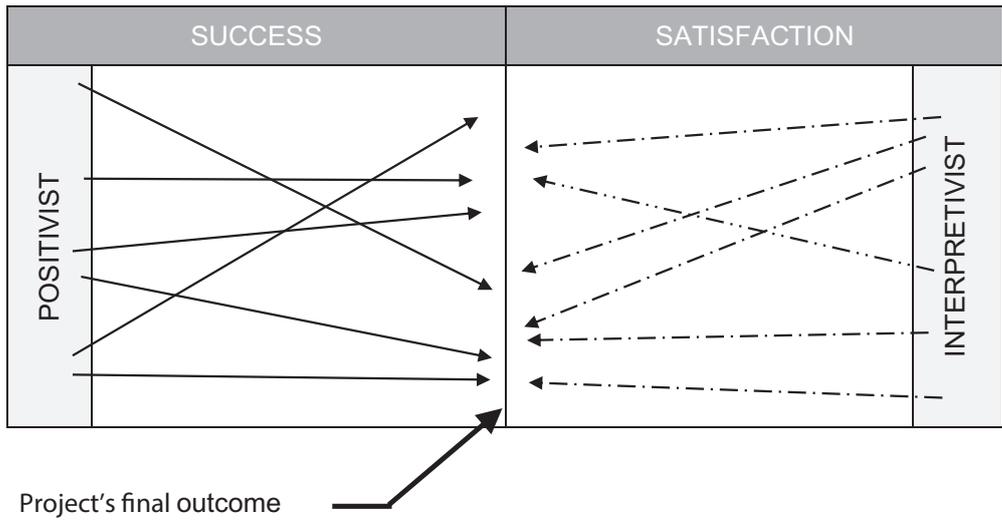
The paradoxical relationship that exists at the boundary of the positivist paradigm, which is based on rationality and objectivity, and the interpretivist paradigm based intuition and subjectivity lead us to the concept of yinyang within the project management construct. A paradoxical framework which conceptualises success (Yang) and satisfaction (Yin) within the project management construct is provided in Figure 3.

Our paradoxical, yinyang framework helps us understand why some projects can be considered a success by some project participants while other project participants are not satisfied. As represented through our framework, success (Yang) is a separate element to that of satisfaction (Yin). They are the result of two different paradigms (positivist and interpretivist) and utilize two different language-games. In our framework, the two occupy their own space and definable reality, but they are disconnected, uncoupled, and not balanced by their complementary element. Viewing our framework through chapter 42 of the Tao Te Ching, we could say that the framework shows that One (project) has given birth to Two (success and satisfaction), but the Two have not given birth to Three (yinyang). Hence, the relationships required for yinyang do not exist and there is imbalance and disharmony between the assessment paradigms. Furthermore, our framework highlights that the seed of success (Yang) lies at the centre of satisfaction (Yin), and the seed of satisfaction (Yin) lies within success (Yang).

6.2 THEME 2: FOCUS

We then applied the theme of focus to our yinyang framework. Our data indicated that there is no set path to reach the project's final outcomes when approaching it from a positivist epistemology. The interviewees noted the existence of multiple potential pathways for achieving a project's final outcomes, even when specific performance criteria (i.e. time, cost and scope) have been set.

Furthermore, the data indicates the same is true of project participant's expectations when approaching the project's final outcomes from an interpretivist epistemology. The existence of these multiple pathways and multiple expectations is conceptualized within our yinyang framework in Figure 4.



LEGEND	
→	Possible pathway to achieve project's final outcome
- - - →	Possible expectation of project's final outcome within project participant group

Figure 4 Multiple pathways and expectations within the yinyang framework

Our data indicated the existence of multiple pathways and expectations at the commencement of the project. To manage this, the interviewees described a process of funnelling. Through funnelling the project manager focuses these multiple pathways towards a single, consolidated outcome. As a complementary force to this (Hubu) the project manager also aligns the multiple expectations to create a group understanding of the project's outcome. The theme of focus and the process of funnelling lead us, once again to the concept of yinyang. Specifically, with reference to the clarity represented in the Taijitu where the project's outcomes and the client's expectations must be clarified, through focus, to allow progress towards a common goal. The concepts of focus and funnelling are applied to our yinyang framework in Figure 5.

As our framework represents, success (Yang) cannot be achieved unless the project manager can focus the direction of the project towards a defined outcome. Complementing this, unless the project manager can focus the project participant's expectations towards a specific outcome, the range of subjective assessments will be too broad to ensure a generalized satisfaction (Yin) with the project's outcomes.

6.3 CONVERGENCE AND PROJECT MANAGEMENT YINYANG

Our framework has already explained how a project's final outcome is approached from alternate paradigms; how these can create a paradoxical relationship; and how this relationship has the potential to result in disharmony and imbalance between the rational and objective assessment of the project Yang and the intuitive and subjective evaluation of the project Yin if these are not tightly coupled. We now discuss how the Two (success and satisfaction) give birth to the Three (Yinyang) within the project management construct.

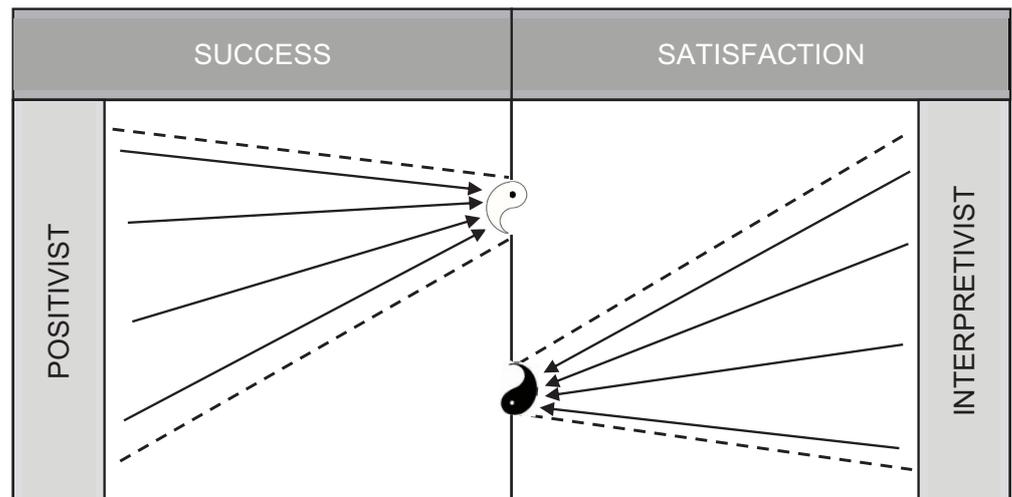


Figure 5 Funnelling in the yinyang framework

Although we recognise that project management yinyang may occur serendipitously, we believe the existence of multiple paths and expectations makes this improbable. Therefore, achieving project management yinyang will most likely occur through the direct actions of the project manager. In order to achieve project management yinyang, the project manager must first recognise the existence of the paradoxical paradigms which are at work in the project management construct. Then they must understand that the language-games of these paradigms can result in different assessments of the project's final outcomes and can result in salient tensions within the project management construct.

Next the project manager must understand that achieving focus, through the process of funnelling, is not enough to create project management yinyang. Focus is required to achieve both success (yang) and satisfaction (yin), but on its own it is not enough to create yinyang. Project management yinyang is achieved through both *focus* and *convergence*. That is the project manager must focus the multiple pathways towards a single outcome to achieve success (Yang). And they must focus the multiple expectations towards a single outcome if they are going to achieve satisfaction (Yin). However, unless the project manager has aligned these two forces so they converge there cannot be Xiangyi [Interdependence], Jiaogan [Interaction and Resonance] or Hubu [Complementarity and Mutual Support] (Wang:2013). If all of these relationships are not present, then project management yinyang does not exist. Therefore, the project manager must create focus and convergence to achieve project management yinyang. This convergence is a form of tight structural coupling between the paradoxical paradigms and is represented in our yinyang framework in Figure 6.

In order to achieve project management yinyang, the project manager must embrace a holistic philosophy. They must understand the alternate and complementary nature of the positivist and interpretivist paradigms within the project management construct. They must understand how success (Yang) and satisfaction (Yin) are created through focus, and they must understand that yinyang is born from the convergence of these elements.

6.4 LIMITATIONS AND CHALLENGES

6.4.1 Sample Limitations

Our research was conducted using a small sample of both case studies and interviewees. The sample size restricts the generalizability of our results. In addition, all our interviewees

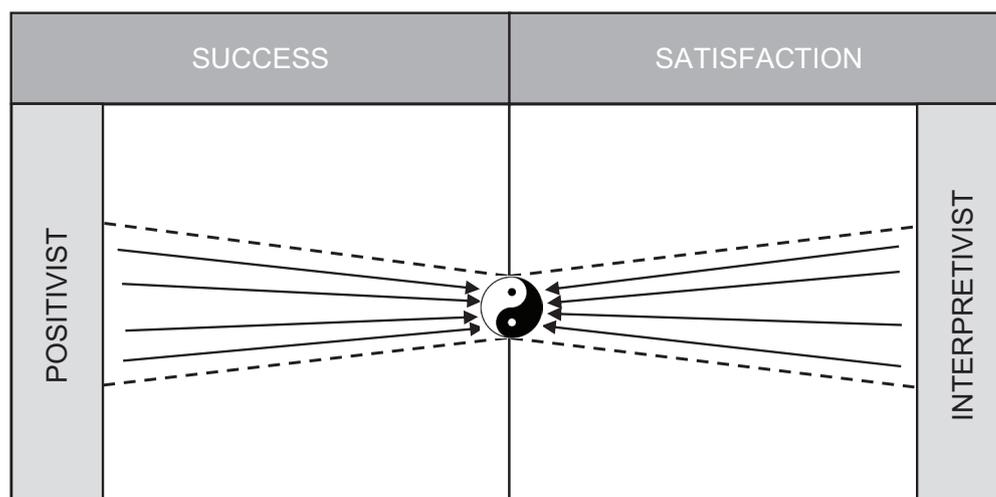


Figure 6 Yin-yang framework: Convergence

were male. This introduces the potential for gender bias in our results and may have skewed the data towards Yang (masculine) biased findings. These limitations could be overcome in future research by selecting a larger, more diverse sample of case studies and interview participants.

6.4.2 Data Collection Limitations

Our case studies were purposively selected because they appeared to include a duality within the social processes under investigation. While this is acceptable within a GT methodology we accept that a purposive selection of case studies has the potential to produce bias results.

The data collection limitations could be addressed in future research by applying the findings of this research to different projects, and by randomly selecting case studies to investigate if our findings are recognisable through these.

6.4.3 Generalisability

Both our research methodology (GT) and our research subject (yinyang) exist within specific contexts. For this reason, the ability to generalize our findings outside the context documented in our research is limited. Future research could consider applying our findings to different contexts to determine if these can be expanded and generalized.

6.5 IMPLICATIONS FOR RESEARCH AND PRACTICE

6.5.1 For researchers

Our research conceptualises project management differently to the traditional, linear representation. By creating a dualistic and complementary framework with alternate starting positions, and by conceptualizing the project's final outcomes at the centre of the project rather than the end, we have been able to provide a new perspective for understanding the project management construct. Further research into novel frameworks may offer new and deeper understandings of the relationship that exists between the elements of success, satisfaction, and project management yinyang.

The Taoist philosophy of yinyang is briefly dealt with in our research, however the complexities and intricacies of this philosophy may have more insights to offer the profession

of project management. Researchers may wish to delve more deeply into the Taoist philosophy in a quest to uncover new understandings not identified in our limited review.

Finally, future research projects could expand our findings through larger and more diverse samples, or through applying our findings to different contexts.

6.5.2 For practitioners

Traditionally project managers have approached their projects from a positivistic paradigm, focussing their efforts on the predetermined metrics of success (Yang). In recent years, this focus has begun to include the subjective element of satisfaction (Yin). However, our research indicates that understanding the existence of the yin and yang of project management is not enough.

Our research indicates that project management practitioners would benefit from adopting a holistic view of their projects, and understanding the importance of both focus (which creates both yin and yang), and convergence (which creates yinyang). This Tao-based perspective may also help practitioners understand that they are not managing two forces (success and satisfaction) within the project management construct, but three (success, satisfaction and yinyang).

7.0 Conclusion

Our research has developed a dualistic, yinyang framework to help understand how both success and satisfaction exist within a project management construct. Using a Grounded Theory methodology, we were able to identify key themes and properties from our field data. This emergent research methodology leads us to consider a Taoist construct for understanding success and satisfaction, and a third phenomenon which we have termed project management yinyang.

Project management yinyang requires project management practitioners to adopt a paradoxical and holistic perspective of their projects, in which positivist and interpretivist paradigms approach the project's final outcomes from alternate and complementary starting points. Our framework provides context for understanding that focus is required to achieve both success (Yang) and satisfaction (Yin), but convergence is required to achieve project management yinyang.

Our research identifies new avenues for research. In addition, it presents practitioners with a new perspective for managing their projects and project participant's expectations. It is our hope that by presenting this novel framework our research will help project professionals achieve project management yinyang.

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