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Explaining attribution in information technology projects

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Abstract

Purpose – The purpose of this paper is to explore the relationship between project failure and success and an individual's attributional style and level of seniority. Information technology (IT)-related projects are often complex because of the need to work with a range of stakeholders and satisfy diverse expectations, and thus projects often fail.

Design/methodology/approach – A case study of a large government organisation was undertaken: interviews and focus groups were conducted and used as primary data for qualitative analysis.

Findings – Line and executive managers have the tendency to increasingly make more pessimistic attributions than support workers, believing that failure was likely to persist in the future because of the inability to influence management and stakeholders. Support workers have the tendency to be more optimistic than line and executive managers and this has implications for self-serving evaluation practices.

Originality/value – The application of the attribution theory provides insights into project success and failure and the discrepancies between line managers' and employees' job satisfaction.

Keywords Project failure, Employee retention, Attribution theory

Paper type Research paper

Introduction

Researchers estimate that a significant percentage of all information technology (IT) projects are failures (i.e. abandoned) (Conboy, 2010). In addition, researchers also estimate that 30 to 60 per cent of all IT projects are partial failures (e.g. cost overruns and time overruns) (Goldfinch, 2007). With this disproportionately high rate of failure, it is unsurprising that IT project failure is frequently cited as the primary challenge facing the IT profession (Standing *et al.*, 2006).

Despite the high rate of IT project failure, there is limited research on the emotional and behavioural impact of IT project success and failure on individuals at varying job responsibility levels (i.e. support worker, line manager and executive manager). This is despite the increased recognition given to social psychology in IT research (Venkatesh *et al.*, 2003), evidence indicating approximately 10 per cent of IT professionals exhibit moderate or severe depressive symptoms, and that IT professionals frequently endure

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criticisms and accusations of obfuscations and cover-ups from failed projects hitting media headlines (Connolly, 2006).

However, understanding the emotional and behavioural impact of IT project success and failure on individuals is a challenging proposition because of the dynamic and complex social and technical environment of projects (Kendra and Taplin, 2004). The social environment of projects is recognised as an important differentiator between projects and a moderator of individual emotions and behaviour (Goldfinch, 2007; Kappelman *et al.*, 2006; Wallace *et al.*, 2004).

The purpose of this research is to understand the emotional and behavioural impact of IT project success and failure on individuals at varying job responsibility levels whilst taking into account the social environment. To achieve this outcome, the research will use an individual differences variable termed attributional style, rooted in social psychology and widely adopted by business researchers to understand differences in individual emotions and behaviour (Cort *et al.*, 2007).

An individual's attributional style is indicative of the habitual way in which individuals explain their own success and failure based on an event (Zullow *et al.*, 1988). Attributional style is capable of revealing whether an individual will tend to experience job satisfaction, performance and success in an occupational environment (optimistic attributional style) or have a tendency to be less productive and less persistent over the long term (depressive attributional style) (Ashforth and Fugate, 2006; Furnham *et al.*, 1994).

Understanding the attributional styles exhibited by individuals in the IT project domain can make a significant contribution to our knowledge of project management, given the limited research into individual emotions and behaviour within this domain (Standing *et al.*, 2006). In particular, attributional style provides the opportunity to identify the important causal dimensions that affect individual emotions that lead to a behaviour consistent with mastery of the IT project domain (e.g. ability to effectively apply knowledge, skills, tools and techniques to IT projects) (Duncan, 1996; Weiner, 1985). For instance, IT support workers may attribute failure to external causes as a means of protecting their self-worth at the expense of being a potential barrier to learning (Duval and Silvia, 2002).

The paper is structured as follows. Firstly, background information on attribution theory is presented. The case study research design is explained followed by the findings from interviews and focus groups. Finally, we discuss the implications of the work for research in IT projects and also for IT practitioners.

Attribution theory

Despite the problems associated with completing projects, there is limited research on the emotional and behavioural impact of project success and failure on individuals. This is partly because of the complex nature of the project environment, where the individual is part of a team with its own social dynamics (Kendra and Taplin, 2004). The objective of this paper is to examine where and how individual emotional and behavioural features impact on project management. We use an individual differences variable from social psychology-termed attributional style (Cort *et al.*, 2007).

An individual's style indicates the way in which an individual explains their own success and failure based on an event. Attributional style is capable of revealing whether an individual will tend to experience job satisfaction, performance and success

in an occupational context (optimistic attributional style) or have a tendency to be less productive and less persistent over the long term (depressive attributional style) (Ashforth and Fugate, 2006; Furnham *et al.*, 1994).

The origins of attribution theory can be traced to the work of Heider's (1958) naive psychology and Rotter's (1966) social learning theory. Naive psychology is "the principles we use to build up our picture of the social environment and which guides our reactions to it" (Heider, 1958, p. 5). A key feature of social learning theory is *locus* of control and is based on whether an individual perceives they can influence their own destiny (Rotter, 1966).

Attributional theory, as posited by Bernard Weiner through several iterations, represents one of the most comprehensive theoretical models about the influence of attributions on behaviour. Weiner (1972) based the original attributional model of achievement motivation around the assumption that "individuals allocate the causes of success and failure to four elements: ability, effort, task difficultly and luck" (Weiner, 1972, p. 240). These causal elements were previously identified by Heider (1958) and were linked to the two causal dimensions of *locus* of control and stability by Weiner (1972).

The *locus* of control represents the internal and external *locus* of control from Rotter (1966), whilst stability was introduced to represent the causes which are perceived to fluctuate over time (Weiner, 1972). Stability was derived from Heiders's (1958) work, in which he contrasted dispositional and relatively stable characteristics such as ability and task difficulty with unstable characteristics such as effort and luck (Weiner, 1979), as presented in Table I.

Based on this research and the growing body of research into the attribution process, Weiner (1979) presented a revised attributional theory of achievement motivation. The revised attributional theory incorporated several significant changes. The most notable is the inclusion of the controllability causal dimension.

The controllability causal dimension was originally identified by Heider (1958) through personal (intentional) and impersonal (unintentional) causes and, subsequently, incorporated into the achievement domain by Rosenbaum (1972) as intentionality (Weiner, 1979). The inclusion of this causal dimension into Weiner's (1979) attributional theory is based largely on Rosenbaum (1972), who argued that causal elements such as mood and effort were both internal and unstable when they were instead quite distinct (Weiner, 1979, p. 6). This acknowledgement tending to support Malle (2004) who criticised Heider's (1958) personal and impersonal causal dimensions as having lost the dimension of intent in the translation to internal and external causes. However, unlike Rosenbaum (1972); Weiner (1979) argued that intent instead reflected control as "a lack of effort does not signify that there was an intent to fail" (Weiner, 1979, p. 6). In conjunction with the inclusion of controllability, Weiner (1979) renamed the *locus* of

Table I.
Determinants of success and failure

	Locus of control	
Stability	Internal	External
Stable	Ability	Task difficulty
Unstable	Effort	Luck

Source: Based on Weiner (1972, p. 240)

control as the *locus* of causality to reflect the fact that it was "conceived as a backward looking" (Weiner, 1979, p. 6) instead of forward looking, as presented by Rotter (1966). The revised attributional theory of achievement motivation based on this update is presented in Table II.

Whilst not incorporated in Weiner's (1979) revised attributional model of achievement and motivation or subsequent work, Weiner (1979) made specific reference to the fact that a fourth causal structure of globality from Abramson *et al.*'s (1978) reformulated model of learnt helplessness could be incorporated into the model. This causal structure would be based on global (can affect a variety of situations) and specific causes (limited to narrow and specific situations).

Whilst Weiner's attributional model of achievement motivation is notable for developing dimensions for achievement outcomes, Weiner's work is also notable for integrating attribution theory with expectancy of success and emotions. This integration has enabled researchers to "understand the effects of attributions on the dynamics of behaviour" (Anderson and Weiner, 1992, p. 307).

Research design

To capture the meanings of attributions and social relationships, a qualitative research approach will be utilised in this research. Qualitative research can be described as:

> […]multi-method in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them (Denzin and Lincoln, 1994).

This approach is particularly well suited for capturing the knowledge of IT project participants within their social and cultural context (Myers and Newman, 2007).

The following two research questions will be addressed in this research to achieve the stated purpose: does attributional style vary as an individual's level of seniority changes for a successful and failed IT project and, if so, then why?

The two research questions investigate the differences in attributional style between job responsibility levels and identify differences in causal dimensions that contribute to mastery of project management.

The case study selected for this research uses interviews and focus groups conducted within a large Commonwealth government department located in the Australian Capital Territory. The organisation was selected because it had an extensive IT project portfolio with IT workers at different levels of seniority; the same work context would allow a focus on differences in attributional style; one of the researchers had knowledge of the organisation.

Locus of causality	Controllable		Uncontrollable	
	Stable	Unstable	Stable	Unstable
Internal	Stable effort of self	Unstable effort of self	Ability of self	Fatigue, mood and fluctuations in skill of self
External	Stable effort of others	Unstable effort of others	Ability of others and task difficulty	Fatigue, mood and fluctuations in skills of others as well as luck

Source: Weiner (1980)

Table II. Revised determinants of success and failure

This approach ensured that critical organisational support was available, such as obtaining access to individuals, which resulted in an improved response rate and ability to conduct in-depth interviews (e.g. additional time availability).

Job responsibility levels

The job responsibility levels within the case study organisation form the focal point for this research. In particular, the job responsibility levels of support worker, line manager and executive manager. These job responsibility levels are indicative of an increase in experience from support worker through to executive manager.

To ensure consistency in job responsibility levels between individuals in the organisation, the Association of Professional Engineers, Scientists and Managers (APESMA) job responsibility definition levels developed for the Australian Computer Society annual remuneration survey were used (APESMA, 2007). The APESMA job responsibility levels based around five levels that were aligned to the job responsibility levels in this research in which APESMA Levels 1 and 2 represent support workers, APESMA Level 3 represents line managers and APESMA Levels 4 and 5 represent executive managers. Based on the APESMA job responsibility levels, the three job responsibility levels in this research are defined as (APESMA, 2007): support worker, line managers and executive manager. A support worker is an individual who undertakes activities under general direction which requires the application and understanding of IT. A line manager is an individual who undertakes IT work under limited direction and typically performs the role of team leader and shows considerable originality, independence, initiative and judgment. An executive manager is an individual who undertakes IT work that involves a high level of management skills under broad direction (may report direct to a chief executive officer). The adoption of the APESMA job responsibility levels in this research will enable future case studies to be compared against findings from this research.

The application of the Work Attributional Style Questionnaire (WASQ) by Ashforth and Fugate (2006) as the research instrument for the interviews will provide researchers with significant insight into the validity of this tool for determining attributional style. In particular, prior quantitative research by Standing *et al.* (2006) using an alternate instrument [i.e. Occupational Attributional Style Questionnaire (OASQ)] in the same domain will be compared. This research is particularly significant to researchers as it represents a cross-instrument comparison using the WASQ and OASQ (Ashforth and Fugate, 2006).

Purposive sampling enabled a sample of 30 participants to be selected for the interviews and subsequent focus groups from a cross-section of the organisation based on IT project experience of successful and failed projects and IT job responsibility level. The approach ensured that critical organisational support was available, such as obtaining access to individuals, which resulted in an improved response rate and ability to conduct in-depth interviews (e.g. additional time availability). Interviews were conducted with 30 employees, which included 10 support workers, 10 line managers and 10 executive managers. In addition, five focus groups discussed the issues.

Case findings

To determine if attributional style varied with experience, reflected through increasing job responsibility levels, the first research question posed was: does attributional style

vary as an individual's level of seniority changes for a successful and failed IT project? Definitions of project success provide evidence that personal success is based around emotions (e.g. pride and joy), abilities (e.g. achieve objectives and job done right) and self-worth (e.g. loosing and winning). In addition, the definitions for project success indicate that support workers do not associate project success and failure with meeting cost objectives, which is traditionally considered part of the basic criteria for measuring project success, alongside cost and quality (Baccarini, 2007, p. 201).

All job responsibility levels exhibit an optimistic attributional style using both the WASQ and the collapsed WASQ (i.e. internality/controllability and stability/globality). All job responsibility levels tend to attribute success to internal causes and failure to external causes. All job responsibility levels tend to attribute success to stable causes. Support workers tend to attribute success to global causes and failure to specific causes. Typical support worker statements for successful projects included:

> It came down to me making sure everything was done properly. (S5)

> I put ideas forward, contributed where I could and did the best I could. (S2)

However, support workers were often quick to attribute failure to external causes:

> There was no management so it wasn't my fault. (S3)

> I had zero influence on the outcome (failure), the issues were out of my reach. (S1)

Line and executive managers attributed success across global dimension (a wide range of situations):

> Success builds reputation and influences other areas at work and outside of work. (E6)

All job responsibility levels tend to attribute success to controllable causes and failure to uncontrollable causes. However, the following pessimistic tendencies were evident such as all job responsibility levels tend to attribute failure to stable causes and line and executive managers tend to attribute failure to global causes. The reasons for these attributions from the interviews are presented in Table III.

For optimistic attributions, it is evident that for successful projects individuals with an optimistic attributional style will tend to attribute the cause of success to their improved confidence, ability to influence stakeholders and management, ability to develop and provide skills, ability of the project manager, ability to delegate responsibility and motivate the team, improved team morale, ability of the organisation to complete projects and realise benefits and the ability of the organisation to retain knowledge. Conversely, during failure, these individuals will attribute the cause of failure to the inability to influence management and stakeholders, inability of the project manager, inability of the team to contribute, inability to obtain organisational commitment, unstable organisational environment and the inability of the organisation to retain knowledge.

Reasons for the pessimistic attributions are presented in Table IV. It is evident that for successful projects, individuals with a pessimistic attributional style will tend to attribute the cause of success to their ability to influence stakeholders and management, ability of project manager, ability of stakeholders, ability of the team to contribute, organisational commitment and a stable organisational environment. Conversely, for failure, these individuals will tend to attribute the cause of that failure to a loss of

Level	Reason	Outcome	Measure and participant
Individual	Confidence	Success	*Globality* Improved confidence because of factors such as recognition of contribution from peers
	Influence	Success	*Internality and controllability* Ability to influence stakeholders and management *Stability* Ability to influence stakeholders
		Failure	*Globality* Inability to influence management *Controllability* Inability to influence management and stakeholders
	Skills	Success	*Internality* Ability to provide skills *Globality* Ability to develop skills *Controllability* Ability to provide skills
Project	Management	Success	*Stability* Ability to obtain a capable project manager who has experience in planning and ensuring business requirements and/or success criteria are achieved *Controllability* Ability to delegate responsibility and motivate project team
		Failure	*Internality* Inability to obtain a capable project manager who has experience in planning and ensuring business requirements are achieved *Stability* Inability to obtain a capable project manager
	Stakeholders	Failure	*Internality* Inability of stakeholders to successfully influence and control project decisions because of a lack of authority and/or communication channels
	Team	Success	*Globality* Improved team morale
		Failure	*Internality* Inability of the team to contribute to the project outcome
Organisational	Commitment	Failure	*Internality* Inability to obtain executive management commitment and sufficient resource allocations *Controllability* Insufficient resource allocations
	Environment	Success	*Stability* Ability of the organisation to successfully complete projects *Globality* Ability to realise organisational benefits from the project
		Failure	*Internality* Unstable organisational environment (e.g. high staff turnover and organisational restructures)
	Knowledge	Success	*Stability* Ability of the organisation to retain knowledge
		Failure	*Stability* Inability of the organisation to retain knowledge

Table III.
Reasons for optimistic attributions

Level	Reason	Outcome	Measure
Individual	Confidence	Failure	*Globality* Loss of confidence
	Influence	Success	*Stability* Ability to influence stakeholders *Controllability* Ability to influence management
		Failure	*Internality* Lack of initiative to influence project *Stability* Inability to influence stakeholders and management *Globality* Inability to influence management *Controllability* Inability to influence stakeholders and management
	Skills	Failure	*Globality* Adverse impact on their perceived professionalism
Project	Management	Success	*Internality* Ability to obtain a capable project manager who has experience in managing and/or directing a team and project
		Failure	*Stability* Inability to obtain a capable project manager who has experience in planning and ensuring business requirements are achieved *Controllability* Inability to delegate responsibility
	Stakeholders	Success	*Internality* Ability of stakeholders to successfully influence the project
	Team	Success	*Internality* Ability of the team to contribute to the project outcome
Organisational	Commitment	Success	*Internality* Ability to obtain executive management commitment and sufficient resource allocations
		Failure	*Stability* Inability to obtain executive management commitment and sufficient resource allocations
	Environment	Success	*Stability* Stable organisational environment (e.g. high staff turnover and organisational restructure)
		Failure	*Stability* Inability of the organisation to successfully complete projects and an unstable organisational environment (e.g. restructuring) *Globality* Negative organisational environment because of unsatisfied stakeholders and/or the realisation of lost organisational benefits
	Knowledge	Failure	*Stability* Inability of the organisation to retain knowledge

Table IV.
Reasons for pessimistic attributions

individual confidence, lack of initiative, inability to influence management and stakeholders, adverse impact on perceived professionalism, inability of project manager, inability to delegate responsibility, lack of organisational commitment, inability of the organisation to complete projects, unstable organisational environment and the inability to retain knowledge. However, based on the attributions for failure, it is evident that the ability to influence management and stakeholders (i.e. stability and globality) and the inability to influence management and stakeholders (i.e. controllability) appears contradictory when aggregated.

Whilst all job responsibility levels exhibited an optimistic attributional style, responses from the interviews suggest that line and executive managers are likely to have a more pessimistic attributional style relative to support workers. Reasons for line and executive managers having an increased pessimistic attributional style relative to support workers were subsequently explored in the focus groups. In particular, line managers and executive managers attributed failure to global causes unlike support workers who attributed failure to specific causes.

Discussion

The research has several implications for researchers and are summarised in this section. The main implications are centred around pessimism and self-serving attributional biases. Line and executive managers have the tendency to increasingly make more pessimistic attributions than support workers. Support workers have the tendency to be more optimistic than line and executive managers and are more likely to overestimate their role in success but not accept responsibility for failure.

Line and executive managers, in contrast to support workers, indicated through the interviews that failure would impact how they are professionally perceived, which in turn would impact subsequent projects (i.e. global consequences). For instance, if individuals perceive a project manager to be incompetent because of a significant project failure, they will be less likely to fully trust that project manager in subsequent projects (DuPont, 1988). The lack of trust is capable of compromising their ability to influence individuals and garner support for future projects that is critical for effective management.

Line and executive managers are dependent on their ability to influence stakeholders and/or management to ensure project success (e.g. ensure resource availability and change request management). In the unfortunate event that line and executive managers are unable to influence stakeholders and/or management because of factors such as organisational politics, it is highly probable that this may persist and impact subsequent projects (i.e. global consequences), making it increasingly difficult to meet expectations. The ability of managers to influence projects is pivotal to project success and highly dependent on their experience (Hyvari, 2006). The inability to influence stakeholders and/or management because of a lack of empowerment is likely to increase feelings of helplessness and organisational tension (Spreitzeir, 2007). Line and executive mangers, in contrast to support workers, are increasingly aware that project failure is not only based around project management failure but also around product failure, which has wider strategic implications that will continue to persist in subsequent projects (i.e. global consequences).

In contrast to support workers, line and executive managers are increasingly involved at the macro-level. This shift from the micro-level (e.g. skills and competencies

and performance measurement systems) to macro-level (e.g. organisational structures and supporting management practices) is accompanied by increasingly complex social and technical challenges (Kendra and Taplin, 2004). The increased complexity of these social and technical challenges typically require significant time frames to change and, therefore, are likely to impact multiple projects (i.e. global consequences). This is in contrast to challenges at the micro-level that are typically limited to a specific project.

In addition to these reasons based around globality in which the causal dimensions varied, the following broader issues also emerged from the research. Line and executive managers are increasingly likely to recognise that knowledge retention initiatives within the organisation are ineffective. The failure to retain knowledge can have an adverse impact on the likelihood of subsequent project successes (Reich and Wee, 2006). This issue compounded, particularly with contracted staff leaving the organisation after project termination. Indeed, research suggests the transfer of knowledge is a critical component of project management success (Kezsbom, 1988).

Line and executive managers, in contrast to support workers, have greater situational awareness potentially because of their involvement at the macro-level. Whilst increased situational awareness has the potential to avoid issues (e.g. visibility of looming issues), it also has the potential to translate into increased cautiousness in decision-making. This increased cautiousness in decision-making is capable of increasing pessimism (Krizan and Windschitl, 2007). Whilst increased pessimism is evident, it appears unavoidable as increased job responsibility levels are based around increased awareness (e.g. competitors and strategic planning).

Line and executive managers are likely to be more experienced. The increased experience is reflected in their recognition that causes of failed projects are likely to persist in the organisation. Line and executive managers, in contrast to support works, are likely to be impacted by increased exposure to projects. The increased exposure to projects, in extreme cases, can lead to increased pessimism prior to burn out and departure from the profession.

Managers are highly dependent on individuals to successfully complete projects. Because of the increased dependence on individuals, they are more likely to attribute success to external causes (e.g. project team and stakeholders). As a consequence of these external attributions for success, pessimism is likely to increase. It is likely that IT professionals involved with projects will refrain from hopelessness and will recover from depression when positive events occur (Needles and Abramson, 1990).

The research analysed individuals currently involved in IT projects. It is evident that significant interest also exists for a comparison of individuals currently involved in IT projects and those who have resigned (e.g. project managers who have transitioned into new careers such as teaching). The potential outcome of this research would have links to the work of Seligman and Schulman (1986), in which a pessimistic attributional style was linked to individuals who were more likely to resign (Seligman and Schulman, 1986).

It is evident that the attribution theory also has the potential to make significant contributions to information systems research. For instance, it can be used in a diversity of areas including workforce planning to address issues such as identifying which IT professionals are most likely to resign. This issue is increasingly important as organisations struggle to attract talent in a market characterised by high demand and decreasing supply of personnel.

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