# Optimistic Bias in Temporal Prediction at a MNC: The Case of Internal Development Projects at KONE Corporation

International Business

Master's thesis

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2011

## Abstract

This research seeks to examine optimistic prediction bias in the empirical world. Interest in this area stemmed from the observation that while the prevailing project planning methodologies typically encourage careful, comprehensive and rational schedule generation, the strict adherence to such methodologies may be insufficient to optimise prediction accuracy if the individual making the prediction deviates from objectivity. Temporal underestimation and schedule overruns are still a familiar fact of life in organisations, and existing research suggests that the tendency to be overly optimistic when predicting future outcomes could be responsible for a significant part of this. This tendency for excessive optimism in prediction is a manifestation of normal human cognition, and is exacerbated by motivational and various other contextual factors that can exist within organisations. Thus, implementing measures that account for and moderate this phenomena could be simple and cost effective, and yet yield substantial benefits for the organisation.

Drawing predominantly on literature based upon the planning fallacy concept, this work applies a rich theoretical framework from psychology and business literature to the case study of KONE Corporation's Global Development (GD) division. The focus of the case study was the identification of the causes and manifestations of optimistic bias in the MNC planning context. This enabled practical recommendations to be generated for moderating the systematic underestimation of project durations by debiasing temporal predictions in the organisational setting.

Qualitative interviews were conducted with GD employees, aimed at identifying the common thought processes that predominate during project schedule generation, along with the prominent planning fallacy variables identified by the literature. This was accompanied by an analysis of archived project planning data to establish patterns in the deviation between past (actual), ongoing (actual/predicted) and future (predicted) durations. Since prior studies on optimistic bias have primarily been conducted under laboratory conditions, a key contribution of this research is the development of some basic methodological guidance for examining prediction optimism in the empirical world.

The research found general support for the existence of optimistic bias and the planning fallacy in the organisational context. The comparative quantitative analysis also revealed that project managers routinely perceived the future as inherently easier than the past. Key research findings included: 1. The best-case scenario is a default manifestation of human cognition in organisational project planning. 2. While project managers universally emphasised the importance of considering their own past experiences when making present predictions, they acknowledged that they typically drew upon the experiences of their colleagues significantly less. 3. The tendency to underestimate duration due to heightened motivation for quick completion and oversimplification of the task is correlated with hierarchical position (evidence of power biases) 4. Expert biases can induce individuals to underestimate training durations in internal development projects. 5. The social context in which predictions are generated can influence the extent of optimism in these predictions. 6. The trilateral relationship between establishing highly ambitious deadlines, task completion behaviour, and project worker stress is a conditional and contentious issue, and consequently one that needs to be carefully considered in planning.

**Keywords:** Optimistic bias; planning fallacy; temporal prediction; multinational project planning; project management

## Acknowledgements

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# 1. Introduction

## 1.1 Background

*"We learn from history that we learn nothing from history."*
   — George Bernard Shaw

People have an innate tendency to underestimate the duration of future events. Manifestations of this tendency can be seen everywhere, from everyday activities up to major public projects. Individuals are generally optimistic about what they can achieve in the future, irrespective of what has happened in the past. Overly optimistic predictions are familiar and recurring, for instance in anticipating the completion of a task before lunchtime, handing in an assignment by tomorrow, or the implementation of a new IT tool by next Christmas. One of the most prolific examples of temporal underestimation in major projects is the construction of the Sydney Opera House, which original estimates made in 1957 predicted would be opened in 1963 for $7 million. A scaled-down version of the opera house finally opened in 1973 at a cost of $102 million (Hall, 1980, as cited by Buehler, Griffin and Ross, 1994; 2002). Another example is the Denver International Airport, which opened 16 months late in 1995 with cost overruns of $3.1 billion (Buehler et al., 2002).

The prevalence of significant time overruns in organisational projects has been well established in both academic literature and endless anecdotal evidence (Buehler, Griffin and Peetz, 2010a). Governments, businesses, universities, and individuals all spend significant amounts of money and effort attempting to forecast the duration and feasibility of projects (Buehler and Griffin, 1999). Organisations are perpetually plagued with systematic underestimation in planning, where time and budget overruns are often regarded as a "familiar fact of life" (Kahneman and Lovallo, 1993). Appendix A provides an illustrative insight into indiscriminate nature of optimism in future prediction – describing the writing of this thesis itself from the author's perspective.

In a review of projects in the United States across various industrial sectors in 2009, The Standish Group (2009) classified 32% as successful, 44% as challenged (late, over budget and/or downgraded from the original scope), and 24% as failures (cancelled

prior to completion or never used). The temporal planning inaccuracies that arise from excessive optimism in prediction can have substantial economic implications for organisations (Connolly and Dean; 1997) and cause job losses (Buehler and Griffin, 1999). Additionally, unrealistic targets and prolonged completion times can result in employee stress, frustration, disappointment, and reduced job satisfaction during task completion (Boltz and Yum, 2010; Weick and Guinote, 2010).

Therefore, this research aims to examine one of the most pertinent forms of planning inaccuracy for organisations: optimistically biased time predictions. The predominant explanation in the literature for systematic optimistic bias in prediction is the *planning fallacy* account. The planning fallacy, as originally coined by Kahneman and Tversky (1979, as cited by Buehler, Griffin and Ross, 1994), is defined here as the tendency for individuals to underestimate the time required to complete a given task, despite the availability of contradictory historical information. Thus, the intriguing aspect of the planning fallacy is not that individuals are excessively optimistic, but that they remain optimistic in the face of contradictory historical evidence. This presents a cognitive paradox, with people seemingly able to hold two conflicting beliefs: *"although aware that most of their previous predictions were overly optimistic, people still believe that their current forecasts are realistic"* (Buehler et al., 1994: pp366).

Hence, an important clarification is that while optimistic prediction bias is fundamental to the planning fallacy, the planning fallacy is not optimistic bias alone. The underlying mechanisms are inherently the same, although the planning fallacy requires an additional condition: personal experience or historical information that contradicts the overly optimistic prediction. This research will identify various mechanisms that underpin optimistic prediction bias, as well as review cognitions and other biases that induce individuals to overlook past experiences.

Consequently, there will be research reviewed that indicates the existence of optimistic prediction bias though not the planning fallacy (i.e. if the individual exhibiting the prediction bias has no historical information available for consideration when making their judgement). However, this will focus primarily on the "planning fallacy" account for two main reasons. First, because it provides a more comprehensive approach that

inherently encompasses optimistic planning bias. Second, because in practice it is highly likely that individuals and organisations have some historical information available to help with their judgements (i.e. it is highly probable that something similar has been done before); whether it be in developing the schedule for a large construction project, or an academic leaving work on Friday with the full intention of completing a vast amount of work over the weekend, despite their awareness that they have not completed anything close to that in weekends prior (Buehler et al., 1994; 2002). Thus, this notion that there is typically something from the past to refer to in planning means that the planning fallacy concept is particularly pertinent in real life activities.

The planning fallacy literature primarily attributes the empirical prevalence of planning inaccuracy to a variety of cognitive biases and misdirected motivations. Cognitive biases are defined here as *errors in the way the mind processes information* (Lovallo and Kahneman, 2003: 58). These underlying cognitive mechanisms that result in biased predictions are far-reaching; perpetuating a wide range of related psychological processes including the tendency to anticipate more extreme emotional reactions to future events (Buehler and McFarland, 2001), overestimating the longevity of romantic relationships (Buehler, Griffin and Ross, 1995, as cited by Buehler et al., 2010a), and underestimating the extent of future financial spending (Peetz and Buehler, 2009).

These cognitive biases induce individuals to overestimate short duration tasks and underestimate long duration tasks (Buehler et al., 2010a; Byram, 1997; Roy and Christenfeld, 2008). The specific cut-off point for what constitutes a "short" or "long" task depends on various task and contextual aspects (Roy and Christenfeld, 2008). However, laboratory research predominantly suggests that this cut-off point is typically very low, with underestimation becoming far more common for tasks greater than twenty minutes in duration (Buehler et al., 2010a; Burt and Kemp, 1994; Byram, 1997; Forsyth and Burt, 2008; Hinds, 1999; Roy et al., 2008; Sanna, Chang, Parks and Carter, 2005). Furthermore, for tasks performed outside of the laboratory lasting longer than a few minutes, systematic underestimation appears to be the norm, perhaps due in part to the multitude of possible interruptions not present in a controlled setting (Buehler et al., 2010a).

The motivation for speed in task completion has also proven to significantly influence the tendency to underestimate duration (Buehler et al., 1997; Byram, 1997). This motivational aspect can be strongly influenced by the planning environment and the incentives and pressures presented to the planner. Other influential variables revealed in the literature that can moderate or exacerbate these cognitive and motivational underpinnings include task type and duration, temporal proximity, and various social and environmental factors. All of these important planning fallacy variables will be discussed in this research, and their relevance to project planning in a Multinational Corporation (MNC) will be evaluated.

As will be detailed in the Literature Review, of the many facets of optimistic bias, some can affect individuals universally, while others are more heavily contingent on certain manipulations, attitudes, predispositions, and circumstances. Consequently, when the planning fallacy literature is applied to the empirical world, a fundamental research objective lies in evaluating and distinguishing between various individuals and groups within the organisation that can influence the project schedule. Thus, a primary component of this research and an important addition to the body of existing literature lies in identifying the key distinctions between different groups and individuals within the organisation with respect to the different attributes associated with optimistic bias. In this research, the primary area of difference was found to be the respective level of organisational hierarchy, and this aspect will therefore be discussed throughout the thesis. Establishing such distinctions should help reveal how these differences impact different individuals or groups' respective propensities to exhibit temporal prediction biases, along with how the interaction between different individuals and groups can influence excessive optimism in prediction.

Since this research will focus on planning accuracy with respect to time, it is predominantly concerned with the temporal estimation of the *planning and development* and the *execution* phases of project management (PMI, 2008). The implicit link between planning in these two phases and project monitoring and controlling is also discussed throughout the thesis.

## 1.2 Research Gap, Problem and Research Questions

This research suggests that if these cognitive, social and motivational forces are addressed it could result in further improvements in planning accuracy. Thus, this thesis aims to identify the important variables that contribute to the planning fallacy (and from where they could arise) *within the MNC planning environment*. The identification of these will be one of the primary research contributions, since the overwhelming majority of existing literature is limited to examining the different contributing aspects to the planning fallacy either under laboratory conditions or in an academic environment. Furthermore, as well as deepen the understanding of optimistic bias in the empirical setting, this integration of theory and practice should serve to provide some guidance for future research in applying theory to practice. That is, this research aims to not only shed light on *what* variables may be important for optimistic bias in a MNC and *where* they could potentially arise within the organisation, but also to advance *how* to examine these in the empirical context.

This work will synthesise the existing literature on the planning fallacy and related phenomena to construct a solid base for investigating which variables of optimistic bias are influential in the organisational context. This will not only address the academic gap, it should also better equip organisations and project managers to mitigate prominent bias-inducing variables that are not adequately addressed by prevalent management practices. Accordingly, this research will also make recommendations for further contributions and possible adjustments to organisational project planning methodology with these bias- inducing factors specifically in mind.

This research will adopt and expand upon the original and still prevailing explanation for the planning fallacy: the inside vs. outside perspective (Kahneman and Tversky, 1979, as cited by Buehler and Griffin, 1994). This concept posits that when predicting the duration of a task, human thought processes induce a disproportionate emphasis on the specific (or '*inside*') attributes of a task, whereas external – '*outside*' – information (the consideration of which has consistently proven to result in more accurate predictions) is more likely to be overlooked. Much of the subsequent literature builds on this fundamental theory, with later research identifying various motivational and

environmental conditions that can influence optimistic prediction bias by heightening or lessening the inside and/or outside views. As will be made clear with a detailed account in the literature review, the appropriate application of both the inside and outside perspectives can best moderate the inherent tendency for optimistic bias in prediction. Hence, this thesis aims to generate recommendations to pursue the *optimal application of both the inside and outside perspectives in a real-life organisational context* to help minimise the negative effects of the planning fallacy.

This research will use the case example of the Global Development (GD) division within KONE Corporation, whose primary focus is to undertake internal development projects to harmonise and streamline the work processes and IT solutions across the diverse multinational organisation. Prior research suggests that IT projects provide a suitable context for examining optimistic bias in temporal prediction. Nelson (2007) deems estimation and scheduling challenges to be the greatest threat to IT project success, and suggests that forecasting accuracy has actually worsened in this area since the turn of the century. Moreover, Abdel-Hamid and Madnick (1991, as cited by Buehler and Griffin, 2003) found that IT projects in particular are susceptible to scheduling problems, owing primarily to poor progress monitoring and insufficient management response when projects fall behind schedule. This research investigates the prevalence of different optimistic biases in internal development projects (enhancing and harmonising global processes and implementing new IT solutions) in the MNC context. Moreover, particular emphasis will be placed on the global implementation (or "*rollout*") phase of the project in this study, as this was found to be one of the more suitable phases to examine and exemplify the prominence of optimistic prediction biases in an organisational setting.

The project planning processes and KONE Way methodology have been rigorously developed and extended over the past few years, with the aim to improve planning accuracy and thereby facilitate enhanced coordination between all projects in the portfolio. However, this research posits that while these implementations have yielded positive benefits for the more rational and tangible aspects of project planning, the psychological and more intrinsic aspects of future prediction have not been focused upon to the same extent. That is, until now, there has been no specific focus on or

allowances made for optimistic prediction bias in the organisation. Consequently, despite the procedural improvements, many of the cognitive, motivational, and social variables that underpin the planning fallacy have been permitted to persist, resulting in the prevalence of planning inaccuracies due to inherently optimistic temporal estimations.

Addressing this research gap would provide an account of optimistic bias in a real-world organisational environment. Many different and often conflicting variables of the planning fallacy have been established in the research, predominantly under laboratory conditions. However, due to the myriad of conditions that can influence their salience, the pertinence of each of these variables is expected to vary significantly in an organisational context. This research therefore broadly aims to identify which of the many planning fallacy variables are influential in MNC project planning, and in doing so contribute to bridging the gap between theory and the empirical world.

Practically, addressing this research gap could generate tangible value for business through the moderation of the negative manifestations that planning inaccuracy can have for an organisation's economic interests and employee satisfaction. Identifying the key influential planning fallacy variables in an empirical context should help highlight the appropriate measures that can be implemented at the organisational, project and individual levels to help mitigate the detrimental effects of overly optimistic predictions and improve accuracy in temporal planning. This research will formulate recommendations from which best practices can be derived and synthesised into organisational operations.

The research problem can therefore be stated as follows:

*The causes and manifestations of optimistic prediction bias in a multinational organisational context.*

The subsequent research questions are:

- What are the most influential contributing variables of optimistic prediction bias in the MNC environment?

- Where could these variables arise within the organisation, and who has the capabilities to address them?
- What are the appropriate measures that can be implemented at the organisational, project and individual levels to help mitigate the detrimental effects of overly optimistic predictions and improve accuracy in temporal planning?

## 1.3 Limitations and Applicability of the Research

Optimistic bias in temporal prediction has proven to be a particularly robust phenomenon. Prediction error rates ranging from between 20 and 50% are consistently produced in planning fallacy literature (Boltz and Yum, 2010). Due to the indiscriminate nature of the cognitive biases and motivations that underpin the tendency for excessive optimism in prediction, the planning fallacy is virtually a universal phenomenon. This is because the underlying cognitions are typical human thought processes, and are not subject to external or environmental factors such as culture, experience or status. Furthermore, factors that influence the motivation for quick completion are consistent with the laws of competition that are inherent to the predominant global economic system.

To test the global robustness of the planning fallacy, Buehler, Griffin, Otsubo, Lehman, and Heine (2000; 2003, as cited by Buehler, Griffin and Ross, 2002; Buehler et al., 2010a) conducted a comparative analysis between Canada and Japan. Japan was considered a suitable candidate for comparison since its interdependent culture provides little motivation for individuals to exhibit self-enhancing biases in self-evaluation (Heine & Lehman, 1995). Nevertheless, the study found no significant differences in prediction between Japanese and Canadian participants, and thought listings showed that people typically focus on the same considerations in planning regardless of culture. Therefore, due to the indiscriminate nature of the tendency to underestimate, the findings and recommendations of this research are expected to be fairly widely applicable.

Since this research involves the extension and testing of existing theory into a new environment, its key limitation is the inherent limitations of the theories upon which it is based. Consequently, this research can only be as comprehensive as the existing

theoretical foundations that underlie it. There may well be some additional contributing variables that are as yet unseen that would not be included in this analysis. This has implications for various methodological decisions that will be discussed in detail in the Research Method chapter.

## 1.4 Thesis Outline

Overall, this thesis is organised in a way that will establish a solid theoretical foundation or 'lens' through which to examine the case environment, describe the research approach and methodology, present the empirical findings and then relate these back to the existing theory to enable conclusions and practical recommendations to be drawn. The following chapter will firstly provide a comprehensive review of the existing planning fallacy literature to establish the foundations for examining optimistic bias in the multinational planning context. The Research Method chapter will then describe the methodology via which the empirical findings were collected and analysed. Subsequently, the Results chapter will describe the case environment. This is sequenced with the intention of providing an overview of the organisational environment along with the predominant challenges and variables within it suggested by the literature to influence both the actual project duration and the propensity to underestimate this duration. The findings are then compared and contrasted to the existing literature to establish consistencies, deviations, and gaps with the predominant theory. Finally, recommendations are made to address the identified biases, followed by suggestions for future research.

# 2. Literature Review

The tendency to underestimate future duration is a particularly robust phenomenon, consistently supported by empirical studies under a variety of conditions that will be discussed over the course of this chapter. The purpose of the literature review overall is to provide a summary of the most appropriate applications of the inside and outside perspectives when making predictions in accordance with the theory. The implications of the planning fallacy variables for the empirical organisational context will be discussed throughout the review, along with possible practical implications for debiasing as suggested by the literature. This information will guide the research approach and selection of methodology in the case study.

This Literature Review will first examine the classical explanation of the planning fallacy: the inside vs. outside perspective. A discussion of the contributing cognitive, motivational and social mechanisms identified by research will follow, along with any relevant contextual conditions that can influence their saliency and influence. This will also include brief descriptions of the practical implications for project planning in the empirical world. The prevalent concepts of the planning fallacy literature will then be summarised and illustrated in a conceptual model. Subsequently, the importance of temporal planning accuracy in the project management environment will be discussed. Finally, the success rates of various empirical attempts to debias predictions will be reviewed specifically in order to establish the most appropriate ways of approaching the mitigation of optimistic prediction bias in practice.

## 2.1 The Cognitive Account

This chapter provides an overview of the underlying cognitive biases that perpetuate optimistic prediction bias and the planning fallacy. It begins with the original, most encompassing and still prevailing explanation: the inside vs. outside perspective. This is followed by an overview of scenario thinking; a prevalent manifestation of the inside view. Together, these concepts suggest that the inside view is disproportionately adopted; intuitively implying that consideration of the outside perspective is implicit to

the planning fallacy's moderation. This is only partly that case, however, as the third section suggests by presenting evidence that breaking up a task using the inside view is beneficial to planning accuracy. Fourth, a summary of related cognitions is presented to deepen the cognitive story behind optimism in planning. Finally, an alternate explanation (memory bias) to the planning fallacy is acknowledged and its relevance for this research is discussed.

### 2.1.1 The Classical Explanation – Inside vs. Outside View and the Use of Memory

*"Insanity: doing the same thing over and over again and expecting different results."*
— Albert Einstein

The predominant explanation for the planning fallacy's existence, first proposed by Kahneman and Tversky (1979, as cited by Buehler and Griffin, 1994) in their initial description of the problem, is that that individuals place excessive emphasis on *singular* (task specific) information and neglect to properly incorporate *distributional* (external and historical) information when making predictions. These two sources of information relate to two contrasting modes of forecasting. The use of singular information is now explained as the adoption of the *inside view* (Kahmeman and Lovallo, 1993), where the task is treated as novel and unique, and only information specifically pertaining to the task and how it will be completed is considered in prediction. In contrast, the *outside view* incorporates the use of distributional information in prediction; primarily the past durations of similar tasks (Kahneman and Lovallo, 1993).

The inside and outside perspectives can be conceptualised here as the principal mediums through which different planning fallacy variables can affect optimistic prediction bias. Other variables of optimistic bias introduced over the course of this Literature Review will primarily influence optimism in temporal prediction by inducing either a change in the ratio of inside vs. outside perspective adoption, or a change in the way in which these views are applied in prediction (or both). Consequently, the rest of the literature concerning the planning fallacy and optimism in planning will be integrated and organised around this fundamental concept.

The importance of the outside view for temporal prediction is evident in the fact that predictions that correspond closely with past outcomes have consistently proven to be more accurate (i.e. less optimistically biased) than predictions that do not consider

distributional information (Buehler et al., 1994; 2010a; Kahneman and Lovallo, 1993; Lovallo and Kahneman, 2003). However, depending on the type of prediction, the inside view may not always produce an excessively optimistic forecast: Kahneman and Lovallo (1993) use the example of parents predicting whether their troubled teen will ever make something of his life (statistics show he will although it doesn't seem like it at the time). Nonetheless, excessive optimism is still the typical outcome of the inside perspective for most predictions. This is because the inside view is particularly susceptible to the pitfalls of scenario thinking, the myriad of cognitive biases that can exacerbate optimism in prediction, and the anchoring on the present and the extrapolation of current trends (Kahneman and Lovallo, 1993).

Cognitive intuition naturally promotes the use of the inside view in prediction. Planners typically adopt this perspective automatically, immediately perceiving the project and team as unique and then extrapolating current trends into the future to develop projections. Based on Zukier's (1986, as cited by Buehler et al., 1994) *narrative mode*, whereby individuals construct a logically sequenced narrative concerning a future outcome using the information at hand, Buehler et al. (1994) found that people tend to formulate a single (and typically optimistic) scenario when planning or predicting future outcomes.

This scenario construction is a manifestation of the inside perspective, and the inclusion of past experiences into the planning narrative is obstructed by three factors (Buehler et al., 1994). First, the implicit future orientation of prediction may prevent planners from looking backward in time. Second, the ambiguous nature of defining "similar" projects can reduce the reference class and make comparison more difficult. Third, *attributional processes* can diminish the subjective relevance of past experiences to the current prediction, particularly when they involved a negative outcome. People tend to attribute past failures to factors beyond their control while taking credit for past successes. For example, Lovallo and Kahneman (2003) refer to a study of letters to shareholders in annual reports, which found that favourable outcomes tend to be attributed to factors within organisational control, such as corporate strategy or R&D. In contrast, executives were more likely to blame unfavourable outcomes on uncontrollable external factors such as inflation or weather.

Through attributional processes, people tend to attribute past planning failures to external, unstable, and specific factors that are unlikely to reoccur, thereby diminishing the relevance of these failures to the future scenario. So even when people are able to easily recall past experiences they are quick to discount them as unimportant. Further, the more unfavourable the implications are for the current plan, the more likely the historical information is likely to be written off as inconsequential. In their analysis of thought processes in planning, Buehler et al. (1994) found that when generating temporal predictions, participants rarely considered their own previous experiences with similar tasks, and when they did they mostly drew upon experiences that helped justify their present optimism. Forecasts were also overwhelmingly introspective; participants rarely considered factors external to the task at hand or even their own characteristics and limitations.

Interestingly, the one difference that did occur in Buehler et al's (2000; 3003 as cited by Buehler, Griffin and Ross, 2002; Buehler et al., 2010a) cross-cultural comparison was that Japanese participants did not display the same attributional tendencies as their Western counterparts. Japanese planners were more likely to assume responsibility for their own past failures, although they were much kinder to their peers, explaining peer failings as subject to more specific, external factors. For Canadian participants it was the opposite case, consistent with the conventional attributional processes outlined above. However, the Japanese participants still demonstrated a similar degree of optimistic bias in their predictions, implying that biased predictions can still prevail in the absence of the motivation to explain away past failures. (Buehler et al., 2000; 2003, as cited by Buehler et al., 2002; 2010a)

The classic prescription for reducing optimistic prediction bias in practice is the adoption of the outside perspective in planning (Buehler et al., 1994; Kahneman and Lovallo, 1993). An example of a technique that directly enforces the outside view is Reference Class Forecasting (RCF) (Lovallo and Kahneman, 2003). RCF *requires* that forecaster base their predictions on the outcomes of a distribution of comparable projects. Considering that Roy et al. (2005; 2008) suggest that people are still inclined to believe that previous tasks took less time to complete than they actually did, explicitly providing accurate historical information should complement encouragement

of the outside view. RCF is therefore an appropriate example, as it involves aggregating and adjusting the actual outcomes of previous projects.

## 2.1.2 Best-Case Scenario Planning

*"History will be kind to me for I intend to write it."*
   — Winston Churchill

The tendency to overlook distributional information in planning also extends to the consideration of alternate future scenarios. This section will describe how human cognitions typically induce a disproportionate emphasis on a single, optimistic future scenario. Buehler and Griffin (2003) found that with complex tasks and projects, an enhanced future-focus can induce increased optimism in planning without the luxury of control over task completion barriers. Hence, the effect on predicted completion time is greater than actual completion time and the planning fallacy is exacerbated.

Although the probability of one particular project setback occurring may be unlikely, the probability of at least one of a combination of potential delays occurring is considerably higher; a fact that is mathematically sound although cognitively counterintuitive (Kruger and Evans, 2004). In fact, people often conceive the opposite: tending to overestimate the likelihood that all events will occur, yet underestimate the likelihood that at least one event will occur (Bar-Hillel and Neter, 2002; Tversky and Kahneman, 1983). This improper probabilistic reasoning is further compounded with the addition of unforeseeable future obstacles to these foreseeable ones. The *availability heuristic* suggests that people base their predictions and attribute greater likelihood to future possibilities that are more easily brought to mind (Tversky and Kahneman, 1973). Accordingly, individuals do not usually make a concerted effort to seek for missing information and are usually content with the information readily available or readily retrievable (Fischhoff, Slovic, and Lichtenstein, 1978, as cited by Byram, 1997; Tversky and Kahneman, 1973; 1974). Consequently, in accordance with the inside perspective, people have a tendency to downplay the likelihood of future interruptions to their plans.

Consistent with this notion, Newby-Clark, Ross, Buehler, Koehler, and Griffin (2000) found that people focus overwhelmingly on a single favourable scenario, and the introduction of additional possible scenarios does little to change their predictions.

When asked to formulate worst-case, realistic, and best-case scenarios, people tend to present 'realistic' scenarios that are virtually indistinguishable from their best-case scenarios (Griffin, Dunning and Ross, 1990; Newby-Clark et al., 2000). Byram (1997, Study 1) also found that best guess predictions differed little from "optimistic" predictions. Furthermore, when compared with actual completion times, the pessimistic scenarios generated in these studies were consistently more accurate than then other scenarios (Byram, 1997; Newby-Clark et al., 2000).

Therefore, even when alternate future scenarios are constructed, the real difficulty lies in encouraging people to perceive these as relevant to their predictions. One possible explanation for this is that when people imagine a single future outcome they become more convinced that it will occur (Koehler, 1991). Moreover, people tend to attribute relatively higher probability to more favourable outcomes (Buehler and McFarland, 2001; Newby-Clark et al., 2000). This implies that the generation of more pessimistic scenarios should have little impact on prediction accuracy because the individual's confidence in the favoured scenario occurring could still be maintained, and the additional scenarios disregarded.

In the organisational context, the generation of one project scenario is common practice, since the single, detailed plan is a typical requirement in project planning (Kerzner, 2006; Pitagorsky, 2007). This emphasis on concrete detail and specific planning could provoke excessive confidence in the generated plan in accordance with scenario thinking. Hence, because project managers are routinely required to develop detailed future plans, the risk of overconfidence in their predictions and likelihood of alternate scenarios being overlooked is potentially high.

The limited benefits of additional scenario generation means that alternate methods should be pursued to remove the project plan from the best-case scenario in the empirical world. To counteract the intuitive perception that all will go exactly as planned (Newby-Clark et al., 2000; Taylor and Brown, 1988), planners could be made explicitly aware of the objective likelihood of obstacles or disruptions in task completion. Techniques such as breaking up the task into subcomponents can also help make obstacles to completion more focal relative to concrete plans. The result of this is

a more comprehensive inside perspective that is less dominated by thoughts of success. This will be discussed in the following section.

### 2.1.3 The Case For the Inside View – Unpacking and Segmentation

On the basis of the information presented thus far, one might expect that the abandonment of the inside view in favour of the outside view to be a logical debiasing technique to mitigate the planning fallacy. However this is not necessarily always the case. As this section will establish, the reason that the inside view is typically detrimental to planning is that the intuitive inside view is incomplete rather than fundamentally flawed. Furthermore, the application of the outside view is more difficult when the project is novel and unique and becomes simpler when the project is more easily comparable to others. Consequently, the relevance and applicability of each view to the scenario is often ambiguous, so Kahneman and Lovallo (1993) recommend trying both in such instances. Furthermore, a more detailed inside perspective can also yield additional information that could improve planning accuracy.

Kruger and Evans (2004) introduced the notion of *unpacking* a task into subcomponents as a means of bringing to light additional task considerations and obstacles to completion. They showed that in doing so, unpacking a task can effectively reduce the optimistic bias in planning, and that this effect is greater when the task is more multifaceted and complex. This implies that by making task subcomponents more visible and accessible, additional information becomes apparent which can then be integrated into the prediction. Forsyth and Burt (2008) furthered this finding by experimenting with task segmentation. This is essentially the task unpacking process with the additional step of predicting completion times for individual subtasks and then aggregating these to obtain a total. They found that the sum of subtask time estimates was consistently higher (and hence more accurate) than the time predictions for the task as a whole.

This finding means that the inside view is effectively comprised of two conceptually distinct and opposing thought processes: the unpacking process and scenario thinking; or process of developing a more concrete future plan within the inside view. The latter involves stating explicitly how the central, higher level task components will be execute

while still ignoring hidden or non-focal task components (Buehler, Griffin and Peetz, 2010a). Doing so can increase the planner's confidence in the scenario they have generated and increase optimism in prediction (Buehler and Griffin, 2003). In contrast, unpacking extends the forecast time to completion by bringing to light additional subcomponents. Accordingly, as Kruger and Evans (2004) showed, the impact of unpacking might only be significant when the task is particularly complex and layered. Byram (1997) and Connolly and Dean (1999) tried to debias time predictions for relatively simple tasks using this task-dividing technique, finding it to have minimal effect on prediction accuracy. This suggests that all task components were apparent enough at face value.

Interestingly, neither Kruger and Evans (2004) nor Forsyth and Burt (2008) found the unpacking/segmentation of multifaceted tasks to be a natural cognitive process. People appeared to intuitively prefer a holistic view, suggesting that breaking a task into smaller parts could be cognitively taxing and run counter to everyday decision-making processes. This implies that the inside perspective is actually incomplete rather than wholly bias-inducing. Because individuals tend to adopt the intuitive aspect of the inside view and neglect the unpacking process, the inside perspective typically exacerbates optimistic bias in planning.

Although unpacking a task can help attenuate optimism providing it sheds more light on previously ignored task attributes, the tendency to overlook task obstacles is still only one factor of many that can contribute to underestimation. For example, a study by Kahneman, Krueger, Schkade, Schwarz and Stone, (2004) that asked individuals to reconstruct their day found that the sum of all daily activity times added up to less that 24 hours. This suggests that even in retrospect there are still other cognitive biases at play that allow some underestimation to prevail. These cognitive biases underpinning underestimation and excessive optimism in prediction will be examined more closely in the subsequent section.

Overall, it is clear from the research concerning inside and outside views that the sufficient and appropriate application of each of these contrasting perspectives is necessary to provide an objective yet sufficiently detailed approach to time prediction.

Practical debiasing attempts and encouragement to adequately apply these perspectives in organisational planning need to be comprehensive, to prevent an emphasis on one view from resulting in the overlooking of the other. The inside view appears to be necessary to properly understand the problem and identify all of its subcomponents, while the outside view helps inject objectivity by comparing between similar projects and past experiences. The inside-outside perspective concept comprises the foundations for planning fallacy theory, and various aspects of these perspectives will be revisited as the literature review unfolds and additional variables are introduced and discussed. Next, this review will take a closer look at some of the peripheral cognitive heuristics that also relate to excessive optimism in planning.

### 2.1.4 More Psychological Attributes and the Tendency to Underestimate Duration

Thus far, this chapter has focused on the tendency for people to adopt a narrative mode when construing the future – thereby generating concrete, specific plans when predicting future outcomes. This cognitive bias is the predominant explanation for the planning fallacy as it specifically encourages the intuitive adoption of the inside view in prediction. So it is this cognitive *focus* that is believed to primarily contribute to optimism in prediction. However, this is also accompanied by a myriad of other complementary attributes of human cognition that also contribute to planning optimism. An understanding of these cognitive biases is intrinsic to a deeper understanding of the way in which future plans are construed.

In a review of preceding psychology literature, Taylor and Brown (1988) identified three of the most common cognitive processes that create positive illusions of reality and thereby contribute to optimism in prediction: Unrealistically positive views of the self, the illusion of control, and unrealistic optimism about the future. These three cognitive processes can both complement and amplify the scenario approach (i.e. the bias-inducing component of the inside perspective) to exacerbate optimism in prediction. Hence, an understanding of these can help clarify the tendency to approach future time predictions optimistically.

Firstly, individuals generally have an overwhelmingly positive perception of themselves, deeming positive personality attributes to be far more characteristic of self

than negative traits (Brown, 1986). Furthermore, the tendency for individuals to perceive themselves as "better" than others with respect to personality attributes and desirable abilities has also been empirically substantiated (Brown, 1986; Dunning, Meyerowitz and Holtzberg, 2002; Svenson, 1981; Taylor and Brown, 1988). One of the more glaring examples of this is 94% of college professors believing that they do above average work (Cross, 1977). Another arises in Svenson's (1981) study on individuals' perceptions of their relative driving ability, which found that the overwhelming majority of participants believed that they were both safer (88% of US participants and 77% of Swedish participants) and more skilful (93% of US participants and 69% of Swedish participants) than the median driver.

The tendency for unrealistically positive evaluation also extends beyond the self. Not only do individuals also perceive their friends and relatives as inherently "better" than others (Brown, 1986), any group that they are involved in is naturally considered better than comparative groups (Taylor and Brown, 1988). This bias in evaluation has implications for the propensity to exhibit optimistic planning biases in the organisational setting, where temporal planning routinely involves group interaction (Heath and Gonzalez, 1995). The impact of the social context on planning optimism will be discussed in more detail in Section 2.4.3.

Baumeister, Heatherton and Tice (1993) also found that inflated self-perception could induce people to overestimate their future performance and therefore make excessive commitments. Moreover, their inability to meet these targets in reality could be further undermined by the additional pressure that they put on themselves or their tendency to sacrifice accuracy for additional speed in completion (in tasks where such a trade off exists).

Individuals are also prone to the illusion of control; tending to believe that they have at least some degree of control over events that in reality purely determined by chance (Langer, 1975; Taylor and Brown, 1988). Langer's (1975) series of experiments found that when factors suggestive of skill (such as competition, choice, familiarity, involvement) are introduced into chance situations, people become more confident in their predictions even though objective probabilities don't change. This suggests that

the conceptual line between skill and chance events becomes subjectively blurred by human cognition, and people often perceive a level of personal control over their environment beyond what can be justified.

Finally, research suggests that most people are future-oriented (Buehler and Griffin, 2003; Gonzales and Zimbardo, 1985, as cited by Taylor and Brown 1988), implying an innate tendency to focus narrowly on specific future plans in prediction (Buehler and Griffin, 2003). Furthermore, people tend to believe that the future will be rosier than the past; bringing more positive and less negative outcomes to them than to their peers (Weinstein, 1998(b), as cited by Armor and Taylor, 2002). However, this inherent disposition does not necessarily translate to optimistic predictions. Armor and Taylor (2002) suggest that people are not blindly optimistic, and that in general, optimistic predispositions are only moderately related to domain-specific expectations and performance. Buehler and Griffin (2003) also found no significant link directly between either dispositional outlook or mood and predicted completion time.

Importantly, these three positive illusions are significantly more prevalent in what could be considered psychologically "normal individuals"; implying that natural, 'healthy' human cognitions induce optimistically biased perceptions of the future. In reference to the commonly accepted signs of stable mental health, Taylor and Brown (1988) showed that – despite the obvious contrast with an accurate self-perception – these three positive illusions have beneficial effects on many of the commonly accepted criteria of positive mental health; namely happiness and contentment, the ability to care for others, the capacity for creative, productive work, and, implicitly, positive self-regard. In contrast, it appears as though depressed people generally do not share these biases to the same extent, giving them more balanced and hence more realistic predictions of future outcomes (Taylor and Brown, 1988).

### 2.1.5 An Alternate Explanation: Memory Bias

This section will present an alternate explanation of optimistic prediction bias suggested by Roy, Christenfeld and McKenzie (2005). Their view is conceptually distinct – though not necessarily exclusive – to the prevailing one that people generally neglect to incorporate memory into their predictions. They propose that individuals actually do

consider past experiences when making predictions, but due to *memory bias* (i.e. inaccurate appraisal of the past) they make inaccurate estimations.

In addition to the widely accepted phenomenon of underestimation in future time prediction, various studies have shown that people also tend to underestimate the duration of past events (Boltz and Yum, 2010; Burt and Kemp, 1991; Kahneman, Krueger, Schkade, Schwarz and Stone, 2004; Roy et al., 2005; Roy, Mitten and Christenfeld, 2008). People generally find it harder to recall information related to past failures compares to past successes (Silverman, 1964, as cited by Taylor and Brown, 1988), and tend to cast past performances in a positive light; perceiving past outcomes to be more positive than the reality (Crary, 1966, as cited by Taylor and Brown, 1988). These findings support the memory bias account, which posits that predictions are biased because they are based on the individual's (biased) estimation of the past duration; rather than the (unbiased) actual duration.

For the purposes of this research it is unnecessary to weigh in on this debate, as these two alternate explanations do not necessarily conflict with one another. Rather, this thesis will adopt the predominant assumption that people tend to discount past experience in formulating predictions, and also accept that the notion that individuals' inaccurate recollections of past durations can further exacerbate this problem. Hence, in this instance the two factors could work in tandem to exacerbate temporal underestimation. Moreover, both have similar and consistent implications for planning; i.e. enhancing the saliency and consideration of accurate past-task durations when making current time predictions.

## 2.2. Organisational Pressures and the Effect of Motivation

Along with the cognitive factors discussed above, motivations for early task completion also play a key role in the exacerbation and justification of excessive optimism in prediction. This section will discuss this impact of the motivation for fast completion on the tendency to underestimate duration. Such motivations can arise from external factors such as the organisational pressures and financial incentives, as well as the intrinsic motivation to complete tasks quickly and successfully.

The motivation for earlier completion has been empirically proven to exacerbate optimistic bias in time prediction. This is due to the greater impact motivation has on predicted rather than actual task completion behaviour (Buehler et al., 1997). In empirical research, the motivation for quick completion is typically manipulated by financial incentives. Studies by Byram (1997) and Buehler et al. (1997) showed that individuals make significantly shorter time predictions when offered financial incentives for early task completion. Further, there was no significant difference in actual time completion in either study. Thus, the optimistic prediction bias was exacerbated as the forecasts became more inaccurate with the introduction of external motivation.

These results imply that people can be motivated to give a shorter prediction without reflecting upon whether they can actually achieve it (Byram, 1997). However, Buehler et al.'s (1997) analysis suggests that rather than being blindly driven by motivation (where people's wishes directly become their predictions), people are more indirectly influenced by motivation through its effects on an intervening cognitive process: Kunda's (1990) *motivated reasoning*. This suggests that the information, beliefs and reasoning strategies used to justify decisions are at least in part determined by the judge's motives (Kunda, 1990). This implies that the introduction of early completion incentives can alter the planning perspective adopted by the planner.

Accordingly, Buehler et al. (1997) found that when presented with incentives for earlier task completion, individuals adjusted their focus to task attributes that helped justify their additional optimism. Study participants with the speed incentive alone were less inclined to base their predictions on previous experience than participants in the other conditions. Additionally, when presented with the speed incentive, participants increased their focus on future plans and reported fewer thoughts about future impediments, fewer thoughts about using the past as a guide and more thoughts about discounting their past experiences. Thus, temporal focus appears to be the mediating variable in the effect of motivation on time prediction, showing how the inside and outside perspectives can be the mediums through which different variables affect optimistic prediction bias. People are more likely to adopt an inside perspective – focusing on factors that suggest an earlier completion time (such as concrete future

plans) – and more likely to discount external information (such as previous experience, possible future impediments) when motivated to do so.

In practice, project managers commonly face a variety of organisational pressures that heighten the motivation for quick task completion (Buehler, Griffin and MacDonald, 1997; Lovallo and Kahneman, 2003). These arise in the initial proposal and approval phases, and can continue throughout the life of the project. Due to the limitations on time and money, competition for new project approval can be intense. Planners are often motivated to present their projects as the most attractive for investment, which has two negative implications for portfolio management. First, it can exacerbate optimistic bias in forecasting. Second, it means that the projects that get approved are more likely to be optimistically biased, resulting in greater probability of disappointment and coordination problems. (Lovallo and Kahneman, 2003)

Buehler and Griffin (2003) identified three possible high level pressures that could potentially affect optimism in planning large public projects: The presence of commercial or political pressure to maintain a public conviction that some optimistic target is attainable, the specifications of a project being upgraded to an unreasonable "wish-list" of features, and the poor monitoring of progress and lack of management attention when projects fall behind schedule (something particularly notable in the software industry).

Additional organisational pressures prevailing throughout the project's duration include the emphasis on speed by top management (both intrinsically and extrinsically; for example via financial incentives), and the suppression of pessimistic dispositions and heralding of positivity and 'team spirit' among employees (Lovallo and Kahneman, 2003). Group participation and discussion can provide additional motivation for optimism in prediction, and the influence of social forces on time underestimation will be discussed in detail in Section 2.4.3.

Overall, this research on motivational factors in planning accuracy suggest that the motivation to finish tasks earlier can encourage planners to delude themselves and justify optimistic predictions by adjusting their focus when planning (Buehler et al., 1997; Byram, 1997). Moreover, Lovallo and Kahneman (2003) suggest that various

organisational pressures and the (mis)use of financial incentives can produce misdirected motivations in organisations. The practical implications for this are clear: minimise the motivation to finish early and emphasise the importance of planning accuracy. Practically this could mean the removal of any financial incentives that encourage quick project completion, perhaps instead providing incentives for prediction accuracy (Buehler et al., 2010a). In addition, any intangible organisational pressures that emphasise speed and discourage disagreement should also be revised (Lovallo and Kahneman, 2003).

## 2.3. Sidestepping Bias-inducing Cognitions and Motivations: Neutral Observer Predictions

This section aims to clearly distinguish between project *actors* and *observers* in temporal prediction, since this status can significantly influence the extent to which an individual is swayed by the bias-inducing cognitions and motivations discussed thus far. *Outside*, or *neutral* observers are individuals not involved in task completion. In this respect they contrast directly with *actors*, who are directly involved with task completion. Studies have shown that objective observers do not share the actors' motivations for early completion and are relatively immune to the cognitions that result in too narrow a planning focus (Buehler et al., 1994; 2010a; Newby-Clark et al., 2000). They are also far more likely to include distributional and peripheral information in prediction generation (Buehler et al., 1994; 2010a; Newby-Clark et al., 2000). This means that those further removed from the task completion should find it easier to effectively side-step the bias-inducing cognitions and motivations discussed above, and generate more objective (less biased) temporal predictions.

Encouraging input from neutral observers in planning has therefore proven to be one of the more successful debiasing techniques (i.e. manipulations that help mitigate optimistic prediction bias). Furthermore, recent research has shown that the adoption of a third person perspective could have a similar effect, by inducing individuals to think as outside observers and sidestep their natural inclinations to an extent (Buehler et al., forthcoming, as cited by Buehler et al., 2010a). Conceptually, these findings imply that the effectiveness (or objectivity) of outsider input in practice is conditional upon their

actual degree of neutrality. This will be discussed in more detail in Section 2.7, which reviews the empirical debiasing attempts from the literature.

## 2.4. Contextual and Social Mechanisms

The cognitive and motivational underpinnings of the planning fallacy discussed thus far can be influenced by a myriad of contextual variables, which need to be carefully considered when attempting to evaluate and moderate prediction bias. The optimistic bias and planning fallacy literature has identified several important environmental and social phenomena that can greatly impact the tendency to underestimate duration. These will be discussed in detail in this chapter, as the consideration (and possible manipulation) of these factors can significantly moderate the extent of the planning fallacy in practice.

Firstly, this chapter will review the trilateral relationship between the level of construal at which a task is conceptualised, the temporal proximity (i.e. the amount of time between planning and undertaking a task) and the tendency to generate biased predictions. Second, the concept of anchoring and adjustment is discussed, to further the conceptualisation of how individuals frame time and generate predictions. Third, the social aspect of the planning environment and how it relates to the cognitions and motivations of planners is outlined. Fourth, empirical findings regarding the relationships between both power and expertise and the tendency for excessive optimism in planning are reviewed. Finally, the relationship between optimistic scheduling and task completion behaviour and its relevance in this research context is discussed, since this is a common argument made in favour of optimistic plans.

### 2.4.1. Temporal Proximity

Research has shown temporal proximity, or the amount of time between when a task is planned and when it is executed, to have a significant influence on the cognitions of individuals in planning. This chapter will first discuss how temporal distance can affect the level of detail in which people conceptualise future events; as explained by Construal Level Theory (CLT). A change in the *level of conceptualisation*, or *level of abstraction*, induced by a change in temporal proximity, has consistently proven to

influence the extent of prediction optimism. Furthermore, the final part of this chapter will explain how even subjective changes in temporal distance can have the same effect.

### 2.4.1.1. The Level of Construal and Temporal Proximity

The bulk of the research on temporal proximity in time prediction is based upon the ideas and assumptions of Construal Level Theory (CLT) (Trope and Liberman, 2003). This was initially conceived as Temporal Construal Theory (TCT) by Liberman and Trope (1998) and later expanded to CLT to establish consistencies with a wider range of research paradigms (Trope and Liberman, 2003). Liberman and Trope (1998) set out to extend the prevailing notion that over-confidence and the planning fallacy arise due to the failure of individuals to incorporate non-focal considerations into their constructed scenario (Buehler et al., 1994) by introducing different degrees of schematicity. TCT (and subsequently CLT) proposes that future events can be construed at different levels, with low-level and high level construals being formulated at close and distant temporal proximity respectively. Specifically: *"in distant future* (high level) *construals, peripheral, incidental, subordinate, and contextual features are either omitted or replaced by more central and abstract features, resulting in more coherent representations"* (Liberman and Trope, 1998: 7). The key differences between the two levels of construal are summarised below in Figure 1.

| High-level construals | Low-level construals |
|---|---|
| Abstract | Concrete |
| Simple | Complex |
| Structured, coherent | Unstructured, incoherent |
| Decontextualized | Contextualized |
| Primary, core | Secondary, surface |
| Superordinate | Subordinate |
| Goal relevant | Goal irrelevant |

**Figure 1.** Distinguishing High-Level and Low-Level Construals (from Trope and Liberman, 2003, p405)

This means that construals of near future events are likely be more concrete rather than abstract, and thus incorporate more peripheral and incidental features such as potential obstacles to completion and competing time constraints. In support of CLT, Liberman and Trope (1998: Study 5) found that people expect to be able to do more in the distant future than in the near future, and that near future but not distant future plans take time

constraints and peripheral activities that present competing time demands into consideration. Accordingly, Zauberman and Lynch (2005) suggest that people generally expect to have relatively more free time to devote to future tasks because they believe that activities that compete for their time today are irrelevant to those that will compete in the future.

CLT also predicts that the influence of outcome desirability (i.e. the "why considerations") relative to outcome feasibility (i.e. the "how" considerations) will be stronger on more temporally distant predictions relative to closer predictions (Liberman and Trope, 2002; Trope and Liberman, 2003). This position illustrates a subtle yet important difference between CLT and the notion that individuals are simply overly optimistic about future outcomes (e.g. Taylor and Brown, 1988). From the latter perspective, optimism in prediction of distant future events can be explained by a higher perceived feasibility of future tasks. In contrast, CLT suggests that planners are more inclined to discount the importance of feasibility when planning tasks that are more distant, rather than perceive them as more feasible (Trope and Liberman, 2003). This is consistent with Buehler et al.'s (1994) findings that people don't learn from their previous experiences: i.e. even if historical evidence shows that their current plans are too optimistic, individuals can overlook this if the task is more temporally distant because they place less significance on the feasibility of the plan. Accordingly, Liberman and Trope (1998: Study 3) found that while plans for the distant future are contingent on task desirability, this had no significant effect on plans for the near future where task feasibility becomes a more influential consideration.

Consequently, individuals have difficulty construing temporally distant events concretely (Liberman and Trope, 1998; Liberman, et al., 2002), and have greater difficulty formulating alternative scenarios for events that are further into the future (Liberman et al., 2002). Furthermore, Liberman et al. (2002) found that in attempting to imagine such alternate future outcomes people tend to generate more extreme possibilities (either positive or negative) than they would do if the event were more proximal. This is consistent with research by Buehler and McFarland (2001) which found that people who focus more on future scenarios when making predictions (i.e. taking a more abstract inside perspective) tend to predict that they will react far more

intensely (either positively or negatively) to certain situations than people who focused more on their prior reactions to similar situations (i.e. using more concrete and relevant external information). These findings suggest that future predictions are more extreme rather than blindly optimistic, and this intensity increases with temporal distance.

CLT thus posits that predictions made closer to the future event should be more grounded in reality. Ironically, however, Nussbaum, Trope and Liverman (2003) found that individuals' confidence in their predictions concerning the future behaviour of others can actually be greater for more distant future situations due to the more simplistic construals upon which these predictions are based.

CLT is therefore consistent with the planning fallacy, as it supports the argument that people underestimate future predictions because they rely on oversimplified representations of future outcomes (Trope and Liberman, 2003). CLT shows how temporal distance can be an important mediating variable in the planning fallacy, predicting that in general, the planning fallacy bias would be greater when forecasting for tasks that are further into the future (Liberman, et al., 2002). This is because predictions for the more distant future are more likely to be based on high-level rather than low-level construals of future events. However, this may not always be the case. Subsequent research has shown that the overall effect of temporal distance on prediction is actually context-dependent, since the low-level construal of future events has two separate and directly conflicting implications.

On one hand, closer temporal proximity should increase the saliency of obstacles to completion and competing time demands (Liberman and Trope, 1998; Trope et al., 2002; Trope and Liberman, 2003; Zauberman and Lynch, 2005), resulting in more conservative estimations (Buehler et al., 1994, Newby-Clark et al., 2000). On the other, closer temporal proximity should induce a focus on more concrete plans for success; thereby increasing the propensity for optimism in planning (Buehler and Griffin, 2003; Newby-Clark, 2000). In a series of studies, Peetz, Buehler and Wilson (2010) extended CLT by examining these different types of concrete (low-level) cognitions and their respective consequences for prediction. They found that the overall effect on prediction

is contingent on which cognition (i.e. focus on either step-by-step plans or obstacles) is more focal at the time of prediction (Peetz et al., 2010).

Peetz et al., (2010) found that for real-life tasks and without cognitive manipulations, people generate more optimistic predictions when tasks are further in the future. The greater focus on obstacles in the close condition compared to the distant condition was found to mediate this effect (Peetz et al., 2010, Studies 2 and 4). This suggests that the focus on obstacles typically takes precedence over the focus on step-by-step plans when temporal distance is reduced. However, when the task was hypothetical (and the consideration of potential obstacles was hence minimised), predictions made with close temporal proximity were more optimistic than both the real task temporally close condition predictions (Study 4) and the hypothetical task temporally distant condition predictions (Studies 3 and 4). Furthermore, when additional cognitive manipulations were introduced to encourage greater focus on concrete plans for success, the two effects appeared to cancel each other out in the close temporal condition resulting in no net effect on estimation (Study 5). Importantly, in each of these studies the actual completion times across the experimental conditions did not differ significantly, meaning that any change in prediction directly translated to a net change in optimistic bias.

Together, these results suggest that CLT should hold in practice, providing that there is sufficient emphasis on potential obstacles to completion and other external factors. When obstacles to completion are non-salient (as with the hypothetical tasks), or there is a specific emphasis on concrete plans rather than obstacles (Peetz et al., 2010, Study 6), closer temporal proximity can actually exacerbate optimistic bias in planning. Interestingly, in one study the increased focus on concrete plans in the close condition coincided with a reduced focus on past recollections of completion times (Peetz et al., 2010, Study 3). This implies that temporal proximity shifted the focus somewhat from external considerations to a more inside perspective. However, *within* the low-level construals induced by close temporal proximity, Peetz et al.'s findings don't imply that thoughts about plans and obstacles are two opposing cognitive forces at opposite ends of a single dimension. Rather these appear to be two independent cognitive mechanisms that have contrasting effects on predictive optimism, and the prevalence of one over the

other depends on the context (e.g. temporal distance, task type, and potentially other factors) (Peetz et al., 2010).

There are also some aspects of high-level construals that could be beneficial for planning accuracy because they can promote adoption of the outside perspective (Weick and Guinote, 2010). For example, the abstraction of concrete scenarios can make them appear more general, which can could enable the integration of more distributional information into forecasting decisions (for instance by increasing the likelihood that planners would then incorporate their past experiences into current predictions) (Kahneman and Lovello, 1993). This means that conceiving information at the more conceptual level could help broaden the reference class and help individuals overcome attributional processes. However, such abstraction must be counterbalanced with attention to task-specific detail (e.g. the benefits of unpacking from Kruger and Evans, 2004). Perceived in this way, abstraction is a double-edged sword that can be both beneficial and detrimental to planning accuracy (Buehler et al., 2010a; Peetz et al., 2010; Weick and Guinote, 2010).

In practice, the primary implications of this research on temporal proximity are "*whether, or when, it is advisable to generate forecasts well in advance of a project's start date, and the degree of confidence that should be placed on such predictions*" (Peetz et al., 2010, p719). This depends not only on the temporal distance of the project, but also on the specific processes that are emphasised and the relative saliency of different types of information at the time of planning. Where possible, requiring project managers to plan their projects closer to the commencement dates whilst explicitly encouraging an increased focus on potential obstacles to completion should help them generate more conservative time estimates. (Peetz et al., 2010)

### 2.4.1.2. Temporal Framing and Subjective Temporal Proximity

This section will review a slightly different approach to manipulating the level of construal. This was introduced by Sanna, Chang, Parks, and Carter (2005), who demonstrated how a change in temporal distance can influence prediction, *even when the change is purely subjective*. They found that different ways of temporal framing could impact optimistic prediction bias (tested in a group setting) by making deadlines

appear subjectively closer or more distant. Positive temporal framing begins with the task starting point and moves forward in time (e.g. *"starting today, we still have 2 months left before the deadline"*), thereby implying a subjectively longer task duration. Negative temporal framing starts with the deadline and works backward (e.g. *"given the deadline, we only have 2 months left"*), implying a shorter remaining duration. Importantly, since the temporal shift is purely subjective, the actual deadline does not differ between frames. Sanna et al. (2005) found that individuals presented with negative temporal frames perceive the impending deadline as substantially closer than when presented with positive temporal frames. This induces them to make more conservative (and hence less optimistically biased) predictions of task completion time.

Moreover, this effect appears to be mediated not only by thought *content* (i.e. focus on plans vs. obstacles; consistent with CLT and Peetz et al. (2010)), but also by thought *accessibility* (i.e. how easy it is to generate thoughts of success vs. failure). Sanna et al. (2005) manipulated thought accessibility by introducing conditions where people were asked to list thoughts about successful task completion. Thoughts of success are made more difficult to formulate when people are asked to generate many of them. In doing so they conclude that there can't be very many examples of success, or else it wouldn't be so difficult to bring them to mind (Swarz, 1998, as cited by Sanna et al., 2005). The results showed that when people experience greater difficulty in bringing to mind thoughts about success relative to thoughts about failure, the optimistic bias was less pronounced.

Boltz and Yum (2010) extended Sanna et al.'s work on temporal framing manipulations by separating the conceptualisation of time and linguistic framing manipulations. First, their research distinguishes between the ego motion perspective and the time motion perspective; two different ways in which time can be perceived relative to the self. In the ego motion perspective: *"time is considered a stationary backdrop through which individuals move and as they do so, the future is ahead and the past is behind"* (Boltz and Yum, 2010, p896). Conversely, in the time motion perspective: *"individuals regard themselves as stationary entities as time moves toward them"* (Ibid, 2010, p896).

Accordingly, Boltz and Yum (2010) suggest that Sanna et al.'s (2005) temporal framings included two subtle yet separate manipulations: for example, the ego motion perspective was apparent in the condition where the term "from when this task begins" was used (implying a more distant ending time), and this was reinforced by a linguistic term – "still" (suggesting a longer experimental session). In contrast, Sanna et al.'s (2005) negative temporal condition suggests a time motion perspective ("from when this task ends") that is accompanied by linguistic reinforcement (i.e. the use of "only").

The studies found that adopting the ego motion perspective significantly increased the perceived distance of the ending time and hence the optimistic prediction bias (Experiments 1 and 2). Additionally, prediction optimism was significantly exacerbated by the inclusion of positive linguistic manipulations implying longer task duration (Experiment 2). Furthermore, two different priming manipulations for time conceptualisation were used in different conditions to equal effect, despite one (the linguistic prime) being far subtler than the other (videos). This perhaps suggests that one's conceptualization of time is a highly sensitive variable that can be easily primed using multiple cues from the surrounding environment (Boltz and Yum, 2010).

These results support the notion that the planning fallacy should be more apparent when one adopts an ego motion perspective. Boltz and Yum (2010) attribute this to the perception that the individual is moving away from a past that is increasingly distant towards a future that is construed as less impending than it would be from a time motion perspective. Consequently, in accordance with CLT, the authors infer that the conceptualization of the same future deadline from an ego motion perspective is more abstract. Individuals are hence less likely to consider all of the relevant details and potential obstacles. Moreover, since they essentially have more "control" over time movement, individuals are freer to formulate an ideal scenario in which everything goes as planned. Together, these factors should contribute to greater underestimation in prediction if an ego motion perspective is adopted. In contrast, the time motion perspective presents a more imminent, less controllable, and thus less idealized future, resulting in less optimistic predictions that are based on more concrete conceptualisations of the future and incorporate more external factors.

Boltz and Yum's findings also display robust evidence for the existence of the planning fallacy in a laboratory setting where task durations are relatively short. Since underestimation is likely to be magnified when forecasting tasks involving long-term planning and estimates for project completion dates (Griffin and Buehler, 2005), Boltz and Yum (2010) expect that this effect should be amplified in real-world circumstances.

The impact of temporal framing on perceived temporal distance appears to be quite robust, and people tend to be easily manipulated by alternate temporal frames. A further illustration of the wide applicability of such manipulations is Chandran and Menon's (2004) findings that varying temporal framing can induce significant subjective differences in perceived health risk. They found that framing health hazards as occurring every day versus every year (i.e. by using the same statistics in different units) induces people to perceive them as more proximal and concrete. As a result, this negative temporal framing seemed to help moderate peoples' inherent self-positivity biases by increasing their concern and anxiety about the health hazards, their perceived likelihood that they could be personally affected, and their intentions to exercise precautionary behaviour.

In summary, this research on temporal proximity and the level of construal demonstrates that the consideration and manipulation of temporal proximity, the relative emphasis on different planning considerations, and temporal framing in prediction could help organisations understand and moderate the prevalence of optimistic bias in project planning.

### 2.4.2 Anchoring and Adjustment

This chapter will discuss the anchoring and adjustment process and its relevance in temporal prediction. When generating predictions in the face of uncertainty, individuals tend to base their predictions upon irrelevant "anchors" and adjust insufficiently from these (Epley and Gilovich, 2004, 2006; Tversky and Kahneman, 1974). Tversky and Kahneman (1974) coined this the *anchoring and adjustment heuristic*. While this research will not explicitly investigate this cognitive bias in the empirical context – laboratory studies and observation are more suitable methods for examining anchoring and adjustment) – it is important to understand the basic process, since it influences and

correlates with some of the other optimistic biases discussed. Moreover, due to these correlations with other biases and cognitive processes, measures taken the address the planning fallacy variables in practice could also indirectly moderate the anchoring and adjustment process. This chapter therefore aims to examine these linkages, and thereby enable the subsequent identification of measures that could help account for anchoring and insufficient adjustment in the research recommendations. This will begin by looking at the anchoring and adjustment heuristic in general and then show why it is relevant to temporal prediction. It will then discuss the relationship between the anchoring and adjustment thought process and temporal proximity in time prediction.

In their original conception of the anchoring and (insufficient) adjustment heuristic, Tversky and Kahneman (1974) presented a now classic example of anchoring where participants were asked if the percentage of African nations in the United Nations was greater or lower than an arbitrary number, and then asked to guess the real figure. Results showed that peoples' estimates strongly corresponded with the initial figures that they were presented with, suggesting that their predictions were anchored on the initial (irrelevant) figure and then adjusted from it.

The anchoring and adjustment process is believed to underlie many intuitive judgements, and insufficient adjustment is often used to explain judgement biases (Epley and Gilovich, 2001, 2004, 2006). Even subtle and implicit ("self-generated") anchors can naturally trigger this heuristic to induce a judgemental bias, and it is from these anchors specifically that insufficient adjustment typically takes place (Epley and Gilovich, 2001, 2005). Further, implicitly encouraging or discouraging adjustment from an anchor can result in estimates further from or closer to the anchor respectively (Epley and Gilovich, 2001, 2004).

Perhaps the most plausible explanation for insufficient adjustment from anchors is that people start at the anchor and stop adjusting as soon as their adjustments fall within an implicit range of plausible values (Chapman and Johnson, 2002; Epley and Gilovich, 2004, 2006). This is because this adjustment and testing process is cognitively taxing when the anchor is self-generated (Epley and Gilovich, 2004, 2005, 2006).

In the context of temporal prediction, the anchoring and adjustment explanation for underestimation under uncertainty is that people obtain their time prediction by adjusting forward from the starting point, testing the plausibility of the prediction, then repeating this process until the first plausible prediction is made (LeBoeuf and Shafir, 2009). In this way, individuals "satisfice" by stopping at the lower range of plausible predictions (Epley and Gilovich, 2004, 2006; LeBoeuf and Shafir, 2009). LeBoeuf and Shafir's (2009) studies replicated the findings of both Sanna et al., (2005) and Buehler et al. (2010b), showing that requesting people to generate predictions in terms of days starting from the beginning point (i.e. Sanna et al.'s (2005) positive temporal framing) typically yields relatively lower estimates.

This implies that discouraging the use of positive temporal frames should somewhat remove the process of anchoring and adjusting from the starting point in prediction generation. Accordingly, LeBoeuf and Shafir, (2009) found that making predictions of undetermined future events based on dates (i.e. using a calendar) produces less biased temporal estimations than those based on days to completion Additionally, increasing the time unit size (e.g. from days to weeks or weeks to months) yielded somewhat greater estimates. This is likely due to more significant unit-based adjustments. That is, there would be greater absolute adjustment in the same number of adjustment steps with larger temporal units. (LeBoeuf and Shafir, 2009)

To assess the potential to effectively manipulate the anchoring and adjustment process, one must distinguish between *self-generated* and *external* anchors. This is because insufficient adjustment does not account for judgemental biases for *all* types of anchoring. Strack and Mussweiler (1997) found evidence to support their argument that anchoring based on externally provided figures is actually a special case of semantic priming, and thus not subject to this process of insufficient adjustment. Consistent with Strack and Mussweiler's (1997) contention, Epley and Gilovich (2005) found that both financial incentives for accuracy and warnings about insufficient adjustment could increase the adjustment from self-generated anchors, but not from anchors provided by external sources. Furthermore, in their seminal study on estimations regarding African nations in the UN where random anchors were supplied by the experimenters, Tversky and Kahneman (1974) found that financial incentives for accuracy did not reduce the

anchoring effect or increase adjustment. This implies that the ability to influence adjustment-based anchoring effects via manipulations that encourage increased effortful thought is limited to adjustments from self-generated anchors, due to the effortful nature of the adjustment process (Epley and Gilovich, 2005, 2006).

Despite this stipulation, this research assumes that the findings of Epley and Gilovich (2001, 2004, 2005, 2006) regarding insufficient adjustments and the possible manipulations are applicable to temporal planning (as demonstrated by LeBoeuf and Shafir, 2009). This is because in time prediction there are typically no externally provided anchors, so anchors that arise should be self-generated. Furthermore, the other cognitive and motivational mechanisms underlying optimistic bias in prediction suggest that an individual's 'range of plausibility' should be inherently optimistic. Thus, these findings concerning anchoring and insufficient adjustment imply that this heuristic could further exacerbate the planning fallacy by inducing individuals to stop adjusting at the boundary of an already optimistic range.

Finally, is the potential influence of the anchoring and insufficient adjustment process over dynamic temporal proximity. This is something that hasn't been specifically addressed by prior research, although it could arguably relate to time prediction. The anchoring and adjustment heuristic – when combined with the research on temporal proximity and its influence on prediction – introduces the possibility that if projects are planned well in advance and then reviewed and adjusted later on, the subsequent adjustments to the plan may be insufficient to reflect the present circumstances or potential obstacles (which at that time would be far more salient).

Consequently, planners may be hesitant to either abolish the original plan and start fresh, or sufficiently adjust their forecasts to reflect the present conditions and considerations, because the new estimations are still anchored on the original ones. Moreover, since the original estimations become self-generated anchors – which the planner knows to be fairly accurate but probably still imprecise – adjustment from these predictions becomes cognitively taxing, and is therefore likely to be insufficient.

In sum, the findings of LeBoeuf and Shafir (2009) both support and provide an alternate/complementary explanation for Sanna et al.'s (2005) research and

recommendations regarding temporal framing. The apparent prevalence anchoring and adjustment process enhances the importance of discouraging positive temporal framing when trying to reduce optimistic bias in prediction. The use of larger temporal units (e.g. months rather than weeks) in planning could also encourage greater adjustment from the anchoring point. Finally, providing financial incentives for accuracy and warnings about insufficient adjustment from anchors could also help planners increase their cognitive effort and make more substantial adjustments (thereby generating more accurate predictions).

Additionally, as discussed it is intuitively possible that the anchoring and insufficient adjustment heuristic could relate to planning revisions at different temporal distances. Predictions made at close temporal distances could be anchored somewhat on earlier predictions, thereby allowing any optimistic bias induced by greater temporal distance to perpetuate. To counter this in practice, organisations could actively encourage project managers to generate fresh plans rather than (potentially insufficiently) adjust their old temporal forecasts.

### 2.4.3 The Influence of Social Forces

This chapter will discuss the influence of social collaboration on optimism in temporal prediction. A common justification for group discussion in planning is that is improves prediction accuracy (Buehler, Messervey and Griffin, 2005). However, research suggests that the widespread belief that group discussion has a mediating effect on excessive optimism (e.g. due to the "increased objectivity" it brings) is misguided. In reality, if group members share the same motivations and emotional investment in the project, the case should actually be the opposite. Importantly, discussion with others differs from consultation with neutral observers in this context, as the individuals involved in planning all have similar objectives and motivations for timely completion.

Buehler et al. (2005) found that group discussion induces people to intensify their focus on specific plans and strategies for task completion, and generate more positive future scenarios than they would individually. This translates to greater optimism in planning, resulting in a reduction in the predicted completion time yet no significant difference in actual completion time. Consequently, group discussion can exacerbate the planning

fallacy by increasing the inclination to "plan for success" – i.e. to focus more selectively on factors promoting successful task completion and to suppress thoughts about potential barriers to success.

Buehler et al. (2005) identified four possible root causes for individual optimistic biases being heightened by group discussion. Firstly, persuasive arguments theory (Vinokur and Burnstein, 1974, as cited by Buehler et al., 2005) suggests that the information and arguments raised in a discussion will tend to support some initially biased view.

Secondly, conversing with others vindicates individuals and gives them more confidence in their own initial (inherently optimistic) views. In Buehler et al.'s studies, participants in the group conditions focused more on positive future scenarios and less on possible impediments to completion and negative task characteristics than participants in the individual conditions. Group participants also focused more on positive (group) characteristics. In this way, the emphases on optimism and 'team spirit' become mutually reinforcing, and unrealistic visions of the future are validated by the group (Lovallo and Kahneman, 2003). Moreover, the additional emphasis on positivity in a group setting should be further exaggerated by the way cohesive groups inherently evaluate insiders more positively than outsiders (Brown, 1986; Taylor and Brown, 1988). This combination of a more explicit focus on positive attributes, as well as an overly positive perception of such attributes mean that the group is particularly prone to generating optimistic predictions.

Third, people have a tendency to converge their views with others in a group setting for want of fitting in, and are therefore more likely to amplify optimism and suppress pessimism to appear more of a 'team player'. Furthermore, this tendency may be even stronger in the organisational environment, where collective goals and 'team spirit' are explicitly emphasised and pessimism is habitually perceived as disloyalty and is thereby naturally discouraged (Kahneman and Lovallo, 1993).

Fourth, individual accountability for the final estimate – as well as for any negative repercussions arising due to unrealistic forecasting – may be diffused somewhat in a collaborative planning environment (Buehler et al., 2005).

Other research suggests that the desire to be perceived favourably by others could also influence time prediction. In studies by Pezzo, Pezzo and Stone (2006), self-presentation concerns appeared to increase the extent to which people can hold the two conflicting beliefs that exist in the planning fallacy. Their results showed that when asked to communicate their predictions publicly rather than anonymously, people typically predicted far shorter completion times, resulting in a greater optimistic bias. Additionally, although still optimistically biased, the anonymous predictions appeared somewhat grounded in reality; as indicated by the modest overall correlation between predicted and actual completion times. However, this correlation was absent in the high self-presentation condition, perhaps implying that social influences could take precedence over cognitive processes that ensure predictions are somewhat realistic.

In real world circumstances, much of planning is done in a group setting, and even when project managers formulate their final predictions alone they usually seek information, opinions and advice from others (Heath and Gonzalez, 1995). Organisational forecasting decisions are typically outlined in team meetings using step-by-step plans as justification. To help mitigate the effects of group discussion on optimism, it could be beneficial to formulate individual forecasts and then pool them together, and to introduce collaboration with more neutral observers (Buehler et al., 1994; 2010a).

An explicit emphasis on planning accuracy relative to completion speed could also help redirect the focus of the group, consistent with the redirection of organisational pressures that induce external motivations for quick completion. Buehler et al. (2005) also suggest that task type could potentially influence the extent of optimism induced by group discussion. One possibility is that more conjunctive tasks (i.e. where members are more interdependent and consequently have limited overlaps in their roles) could be less susceptible to optimistic bias because group members may be more inclined to think like neutral observers (Buehler et al., (2005).

In addition to social forces, optimistic prediction bias can also be affected by the relative position of the planner within the organisational hierarchy, as well as their level of expertise. These will be discussed in the ensuing chapter.

### 2.4.4. Power and Expertise

This chapter will discuss the influences that power and expertise can have on prediction optimism. It will first examine the direct influence that power can have on basic human cognition, resulting in a stronger focus on the inside view in planning. This will be followed by an overview of how a higher level of expertise can cloud an expert's judgement when predicting the task completion times of novices.

Guinote (2007) suggests that at the basic cognitive level, power enhances the tendency to selectively emphasise readily accessible information to the detriment of secondary and peripheral information. Accordingly, Weick and Guinote (2010) found that power results in more optimistic time predictions. They found this to be mediated by the tendency of people experiencing greater power to focus more narrowly on task-specific information and the desirable outcome (i.e. enhanced scenario thinking), and less on information that could reduce the optimistic bias in predictions. This cognitive focus can also be conceived in terms of CLT, where power results in greater abstraction. Powerful individuals appear to formulate higher-level construals of tasks, thereby overlooking impediments to completion (Weick and Guinote, 2010).

Furthermore, powerful individuals also typically prioritize task information differently to their subordinates and experience higher motivation to see tasks completed quickly and successfully. This motivation further induces them to focus more strongly on desired outcomes and less on potential obstacles and setbacks (Weick and Guinote, 2010). The enhanced focus on task-specific information effectively facilitates an inside view in planning, and reduces the emphasis on factors external to the focal goal.

The notion that power can exacerbate optimism in prediction is particularly important for practice because it identities those at higher levels of organisational hierarchy as particularly susceptible to biases in forecasting. Further, since people in positions of power typically have greater motivation for fast and effective task completion, this effect should be even greater when the stakes are higher (Weick and Guinote, 2010). Not only does the resulting planning inaccuracy have negative economic implications for the organisation, overly ambitious scheduling can also put employees under excessive pressure and stress (Weick and Guinote, 2010). These findings also indicate

that planning accuracy could be improved by encouraging those in powerful positions to consider and incorporate task information outside of their focal goal, as well as place greater weight on the predictions of individuals in positions of lower power.

The high expertise of planners can also exacerbate optimistic prediction bias if they are planning for novice employees. Hinds (1999) compared the prediction accuracy of time estimates for novices completing new tasks made by experts, intermediates and the novices themselves. The studies found that experts displayed a far greater optimistic bias in their predictions of novices' completion time prediction than did intermediate users or the novices themselves. The intermediate users were the most accurate (i.e. the least optimistically biased). Novices also made quite inaccurate predictions, although this to be expected as they should have little knowledge of the task they are to undertake.

Hinds (1999) attributed the relative inaccuracy of expert planners primarily to the availability bias: experts appeared to use anchoring and insufficient adjustment based upon biased memories of their own novice experiences. This implies that experts could have a hazy memory of exactly how long it takes to learn a new task, and thus underestimate this duration when predicting for others. Intermediates made far more accurate predictions, suggesting that since their own experiences are fresher in their minds, their memories of these durations are less biased. This is consistent with the memory bias argument (Roy et al., 2005, 2008). Experts also appeared to anchor their predictions based on their own competences and make insufficient adjustments to account for the difference between their skill level and that of a novice (Hinds, 1999).

Interestingly, experts were virtually immune to the debiasing manipulations applied in Hinds' research, whereas the debiasing techniques had some influence on the predictions of intermediate users. This could imply that the manipulations induced memories and considerations that were far more salient and less abstract for intermediate users compared to experts (i.e. intermediate users remember more clearly what it is like to be a novice). Hinds (1999) presents three possible explanations for this. First, this could be due to the difficulties experienced by experts in understanding the problems faced by novices, even when they were reminded of them (because they

themselves could easily overcome such difficulties). Second, experts might be overconfident in their initial estimations, and thus unwilling to change (although this was not supported by the reported confidence levels in Study 2). Third, it could be that although these two debiasing techniques were ineffectual, others could potentially have an impact.

These findings suggest that possible practical measures to moderate optimistic prediction bias in the organisational context include providing feedback on the accuracy of experts' predictions (so that they can learn from their mistakes), involving intermediates in the planning process, and gathering information directly from novices concerning their abilities or past completion times to integrate into their predictions.

### 2.4.5. The Impact of Ambitious Scheduling on Task Completion Behaviour

The notion that optimistic plans can positively affect the productivity of employees during task completion is a common argument made to support the generation of optimistic plans, as well as a point of some contention in the planning literature. This section discusses the impact of optimism in prediction on task completion behaviour. As will be made clear, the validity of this argument hinges almost entirely upon the planning context and nature of the task.

There are several theoretical approaches that support the notion that optimism in prediction should influence completion behaviour (for reviews see Buehler et al., 2010a, p48; Buehler et al., 2010b, p24). These include motivational, goal setting, and consistency theories, which predict that envisaging positive future outcomes can induce increased effort and commitment in completion behaviour, thereby reducing completion time. In addition, optimistic predictions could potentially impact task completion behaviour by eliciting a greater focus on the exact conditions under which the task will be completed.

If this were the case, optimistic task completion estimates would be self-fulfilling; with individuals striving to earlier actual completion times due to the additional motivation that an earlier predicted finishing time induces. This implies task completion outcomes would eventuate that could not be explained by the planning fallacy.

In examining the process by which optimism can improve prediction accuracy by influencing completion time more than prediction, Koole and Van't Spijker (2000) looked at generation of *implementation intentions*. They describe implementation intentions as concrete action plans that specify when, where and how a task will be executed. This process differs from scenario thinking because it induces planners to highlight potential obstacles to task completion *given the specific task completion environment*, whilst also building wilful commitment to task completion (Buehler et al., 2010a; Koole and Van't Spijker, 2000).

Koole and Van't Spijker's (2000) studies found that the formation of implementation intentions could indeed induce a more significant effect on actual rather than predicted completion time. Additionally, implementation intentions reduced the number of interruptions (perhaps implying that implementation intentions tempt people to seek out environments where they are less likely to be disturbed), which contributed to this reduction in completion time. However, while these findings are seemingly inconsistent with the planning fallacy concept, this apparent contradiction can be explained through an important clarification.

Crucial to the debate surrounding the influence of optimism on task completion behaviour is the task type itself; specifically in the distinction between *closed* and *open* tasks. This clarification virtually harmonised the empirical findings of studies previously thought to be conflicting. Closed tasks can be completed in a single setting and are therefore relatively impervious to outside disruption once started. Furthermore, the barriers to completion in closed tasks are predominantly internal (such as forgetfulness, a lack of motivation, and weakness of will) and are hence more controllable. Open tasks require multiple steps to be completed at different times or in different locations. The barriers to completion for open tasks are primarily external (such as competing projects, unexpected problems in the task itself, and missing resources) and are consequently far less controllable. (Buehler and Griffin, 2003; Buehler et al., 2010a; 2010b)

Buehler et al., (2010b) found that any impact that increased planning optimism has on task completion behaviour is greatest at the very beginning of task commencement, and

quickly diminishes as the task progresses. Therefore, for closed tasks, which can be completed in a single sitting with minimal interruptions and predominantly internal barriers to completion, increased planning optimism resulted in both an earlier starting time and earlier completion time. However, since the behavioural effect typically diminishes quickly, over the more extensive and multistage course of open tasks it had no overall effect on completion time. In Buehler et al.'s (2010b) experiments, even though the additional initial optimism induced an earlier starting time for open tasks, they still did not finish any earlier than the control group (Studies 4a, 4b).

Koole and Van't Spijker (2000) suggest that increased optimism in prediction can encourage increased focus on concrete plans. As already discussed, Buehler and Griffin (2003) showed that this relationship also works in reverse. Therefore, an increased focus on concrete future plans in open tasks (where there is little control over task completion barriers) should result in an earlier predicted completion time whilst having a negligible effect on actual completion time (Buehler and Griffin, 2003; Buehler et al., 2010b). This suggests that increased optimism in planning open tasks should inevitably exacerbate the planning fallacy.

To support these findings, Buehler et al. (2010b) also identified relevant studies from previous literature that applied manipulations which significantly affected the predicted task completion time, and classified the tasks involved as either relatively closed (Buehler et al., 1994, Study 4; Koole & Van't Spijker, 2000, Study 1; Pezzo, Pezzo et al., 2006, Study 1) or relatively open (Buehler et al., 1997, Study 1; Newby-Clark, Ross, Buehler, Koehler, & Griffin, 2000, Studies 1, 3, and 4; Buehler & Griffin, 2003, Studies 1 & 2). A quantitative review of these found that differences in prediction optimism were far more likely to translate to differences in completion behaviour for closed tasks.

Overall, this reveals clear implications for when it might be beneficial to generate knowingly optimistic predictions. Because the impact of planning optimism on task behaviour is limited to closed tasks, any attempts to increase prediction accuracy (i.e. by inducing a greater effect on completion behaviour than prediction) should be restricted to this task type alone. The research suggests that optimism in planning closed tasks could potentially serve as additional motivation and help obtain stronger employee

commitment that could positively affect task completion behaviour (i.e. induce people to work faster), thereby resulting in a shorter actual task duration. On the other hand, if the task is relatively open one should not expect a sustained or significant behavioural difference due to greater optimism in prediction.

## 2.5. Summary of the Planning Fallacy Theory

A summary of planning fallacy theory is illustrated below in Figure 2. This was initially presented by Buehler et al (2010a), and has been expanded through the integration of additional theoretical concepts.
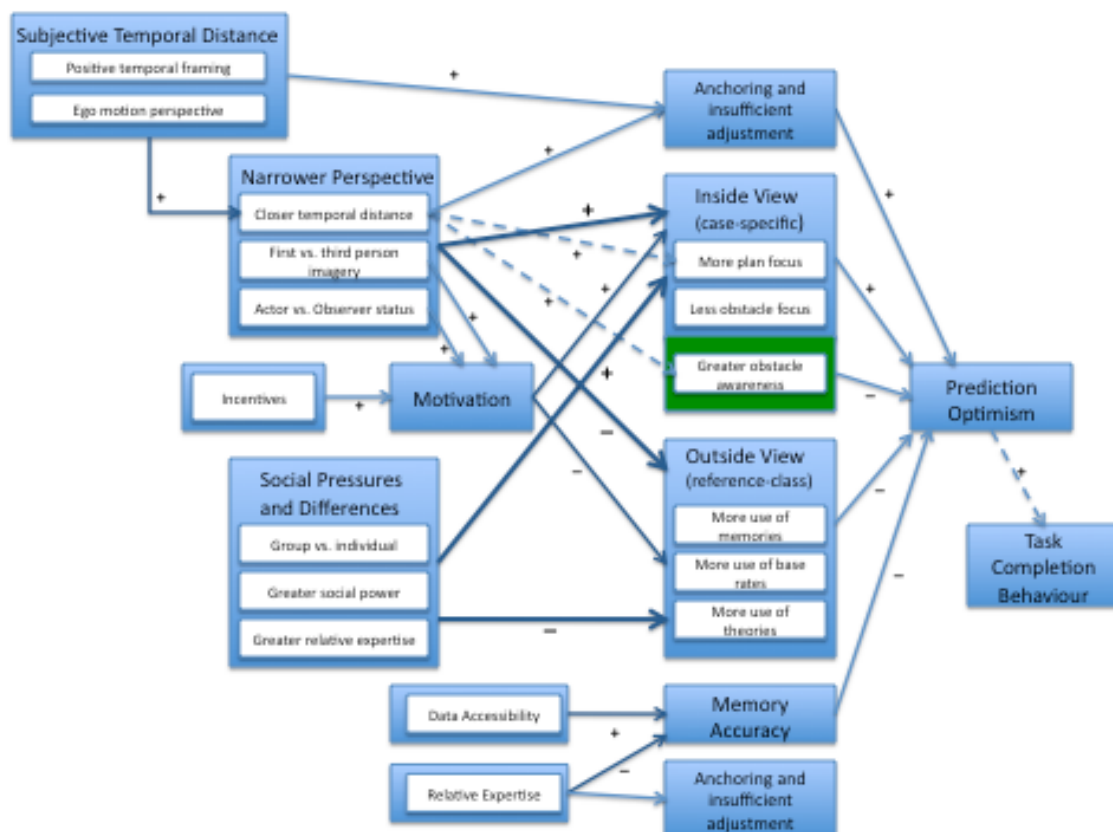


**Figure 2.** The Conceptual Model of the Planning Fallacy (adapted from Buehler et al., 2010a, p25)

Several additions and modifications have been made to Buehler et al.'s (2010a) model to enable the integration of every concept discussed. Importantly, as established over the course of this Literature Review, the inside view is separated into manifestations that exacerbate planning optimism (i.e. those that perpetuate focus on specific plans and less on obstacles; essentially scenario thinking) and that moderate planning optimism

(i.e. revealing additional task subcomponents and obstacles). The positive aspect of the inside view is indicated in green.

Conditional relationships are indicated by a dotted line; i.e. the relationship between temporal proximity and the contrasting components of the inside view, and the relationship between prediction optimism and task completion behaviour. The effect of memory bias account and its conceptual correlation with Hinds' (1999) expert biases have been included under 'Memory Accuracy' and 'Relative Expertise' respectively. 'Data Accessibility' is also included here to accommodate for the notion that access to accurate historical data should help planners overcome biased recollections of past events. In addition, the anchoring and adjustment process, which is considered to occur concurrently with the inside and outside views, appears twice in the figure. The established link with expert's thought processes is indicated at the bottom of the figure, with the intuitive though as yet empirically unproven links with temporal distance (both actual and subjective) illustrated at the top.

The following section will describe the importance of planning accuracy in the empirical world, and discuss some practical areas within organisational project planning that may relate to the propensity to underestimate duration.

## 2.6. Optimistic Prediction Bias in the Project Management Environment

This section aims to relate the theory presented thus far to project planning in the organisational context. This entails a brief discussion of project management literature to convey the significance of temporal planning accuracy in organisational projects, and provide some direction for the ensuing research through the identification of some areas where optimistic biases could potentially arise.

Realistic temporal estimation is routinely acknowledged as one of the most important and most challenging aspects of project management (Pitagorsky, 2007). Project time management is one of the Project Management Body of Knowledge (PMBOK) guide's (PMI, 2008) nine project management knowledge areas, and is arguably one of the more susceptible to subjectivity since it directly entails future prediction. This section will

briefly summarise the key themes of the planning fallacy literature with respect to the project management environment in an organisational setting to establish a clear direction for this research. Planning fallacy biases are expected to manifest both at the *project level*, meaning the cognitive and motivational biases of the individual project manager), as well as the *portfolio level,* which encompasses the influence of different hierarchical levels to the project managers as well as from attributes of the social context in which predictions could be generated.

A single project is naturally linked to directly to the project portfolio overall; a relationship that further emphasises the high importance of accuracy in project management (Martinsuo and Lehtonen, 2007). The effective management of individual projects is crucial to the efficiency of the portfolio, since disruptions at the project level have direct implications for portfolio management (Elonen and Artto, 2003; Martinsuo and Lehtonen, 2007).

Based on the way in which individuals typically construe the future, the inclusion of distributional information in project planning should significantly benefit time planning accuracy. Indeed, Pitagorsky (2007) recognises past experience as one of the foundations of effective estimation, along with commonly understood objectives and a realistic assessment of expected conditions. However, the paradox of the planning fallacy suggests that due to attributional cognitive processes and an inclination toward the inside perspective, such experience might be overlooked despite its criticality for accuracy in estimation. This point was clearly established by Pitagorsky (2007) in an anecdotal account of the real-world consideration of past experiences:

*If the projects you are doing are fairly repetitive – say you are renovating kitchen after kitchen, installing the same software application over and over again, or putting on a wedding every week – then make sure there is a historical record of the time, cost, and conditions for the projects you have done and use it to estimate future projects. Take into consideration similarities and differences between past and future projects. Everyone I run into knows this. Few do it. (Pitagorsky, 2007, pp 70-71)*

Additionally, any inclusion of relevant experiences could be skewed by memory bias. This means that even with active consideration of distributional information, the

schedule can still plagued by some degree of subjectivity. Thus, this research is essentially trying to gauge to what extent to pragmatic nature of project management can overcome the inherent biases that hinder the incorporation of experience into present predictions.

This will entail an evaluation of the actual extent to which similarities between projects are identified and historical information is integrated into current predictions. For project managers, optimising the use of distributional information in planning means overcoming any attributional biases, and filtering out the superficial differences between projects to identify their more fundamental commonalities. In addition to exploring the practical application of prior experience, this research will seek to identify other prominent biases at the project management level.

Moreover, this research will also look beyond the project level to the potential impact that upper levels of hierarchy can have on temporal prediction; i.e. how can the social environment and pressures from above impact project planning optimism in an organisational context? Pitagorsky (2007) suggests that the two predominant afflictive emotions in organisational estimation are greed and fear: greed from the upper management that leads them to make unrealistic demands, and fear from the project manager who feel compelled to accept them. This research will therefore aim to identify the underlying cognitive and motivational explanations for project sponsors championing optimistic deadlines and believing that they may actually be obtainable.

The final section in this Literature Review will discuss the attempts made to debias temporal predictions in the existing literature. This should provide some direction for practical recommendations to be made in accordance with the empirical findings of this research.

## 2.7. Debiasing the Planning Fallacy

The literature reviewed thus far has provided a theoretical base for this research, and the consideration of the multinational context has facilitated the identification of variables predicted to be important for this research. These will guide the research objectives and methodology, with the variables suggested by theory to be important comprising the focus of investigation in the empirical part of this thesis. This section aims to

summarise, compare and contrast the empirical debiasing attempts conducted thus far, along with their conditions and limitations, to establish a feasible foundation to help guide the ensuing research recommendations (i.e. in the Recommendations chapter).

This chapter is sequenced in a way that presents the incremental refinements to debiasing prediction optimism. The majority of empirical debiasing attempts have aimed to correct the flawed prediction process by increasing the salience of distributional information, "hidden" task components and potential obstacles to completion, and have been met with varying degrees of success. Alternatively, as previously mentioned, some studies have also attempted to sidestep the cognitive biases in planning by using neutral observers to make predictions for actors. This has shown to be one of the more successful debiasing techniques, and will consequently be discussed in greater detail than alternate methods. The difficulties in the practical application of this technique will also be discussed, as the success rate appears to be contingent on many different variables that can influence observer 'neutrality'.

The task of debiasing predictions has proven to be reasonably difficult in practice. Generally speaking, many of the studies thus far have experienced limited success in improving both optimistic bias and prediction accuracy (Roy et al., 2008). While some studies experienced success in reducing the *absolute* miscalibration of participant estimations (i.e. the accuracy of the mean prediction), they typically had greater difficulty improving the *relative* miscalibration (i.e. the correlation between predicted and actual completion times)(Roy et al., 2005). So although the overall optimistic bias was generally reduced due to the manipulations, these studies could not consistently improve in the variability in prediction, meaning that predictions were just as likely to be overly pessimistic as overly optimistic.

This limited success highlights the innate embeddedness of human cognition and the complexity of the planning environment. Subsequent advances in the literature can help explain some of these unsuccessful attempts and highlight some of the limitations involved. In doing so, these advances provide a progressively more refined research structure for future attempts.

An example of how initially negligible findings can spawn theoretical refinements is in the breaking down of tasks to reduce underestimation. Both Byram (1997) and Connolly and Dean (1999) found that breaking down the task had no significant impact on time predictions, although they were both using relatively closed tasks with a low level of complexity and thus limited "hidden" components. In contrast, Kruger and Evans (2004) showed that unpacking more complex and multifaceted tasks could increase time estimations by shedding light on otherwise hidden subcomponents.

Similarly, comparisons between successful and unsuccessful attempts can also illustrate the conditions under which manipulations can take effect. For example, the contrasting empirical findings regarding the predictions of neutral observers (relative to actors) could perhaps be explained by the availability of distributional information. The premise behind this manipulation is that neutral observers don't share the same interests and motivations for rapid and successful task completion as actors, and should hence be immune to many of the biased cognitions that result in overly optimistic predictions. Neutral observers don't have the same motivations as actors to negate past failures and attribute them to unique external factors (Buehler et al., 1994), or discount possible completion barriers as unlikely to happen (Newby-Clark et al., 2000), and are therefore more likely to consider these when making predictions.

In testing this, Buehler et al. (1994) and Newby-Clark et al. (2000) found that predictions made by neutral observers were generally more conservative than predictions made by the actors themselves, whereas Byram (1997) found no significant difference between the two. A possible explanation for this contrast is the difference in the availability of distributional information between the studies. Observers that made significantly longer time predictions than actors were presented with either the specific thoughts and/or plans of actors (Buehler et al., 1994, Study 5) or one of three scenarios generated by the actor (Newby-Clark et al., 2000, Experiment 5). These studies found that observers were far more likely than actors to base their predictions on the available information and hence made more conservative time predictions. These studies also involved more open tasks with durations of several weeks, so there is greater scope for prediction error and the use of distributional information is arguably more important than it would be for a closed, shorter task with minimal interruptions.

In contrast, Byram's (1997, Experiment 3) experiment required participants in the observer condition to predict how long it would take the "average" person to complete a relatively closed with a short duration (median completion time was 71 minutes), finding a small but insignificant difference from actor predictions. These observers were not presented with any additional distributional information (aside from the task instructions), so it is possible that in the absence of this they conceptualised how long it would take them to complete the task and then based their prediction on this. The results of these studies therefore support the notion that neutral observers are far more likely to consider distributional information and potential obstacles when making their predictions (Buehler et al., 1994; Newby-Clark et al., 2000), and suggest that the greater the accessibility of such information, the more beneficial it is to the reduction of optimistic prediction bias. Observers are also less likely to lower their predictions of an actor's completion time in the knowledge that the actor has been offered some tangible incentive for fast completion. Actors, on the other hand, reduce their own estimates in the face of such incentives (Mulhern, 2006, as cited by Buehler et al., 2010a).

An important stipulation here is the extent of 'neutrality'. Perhaps a good way to conceive this is the extent to which the observer is likely to rely on distributional information when making predictions about actors. For instance, since positive self-perception also extends to family, friends and close associates (Brown, 1986; Taylor and Brown 1988), third-party estimates might be no more accurate if there is high familiarity between observer and actor. Once observers learn something about the acting individual, they become far more likely to rely on this case specific information at the expense of distributional information when making their predictions, to the detriment of prediction accuracy (Epley and Dunning, 2001). Task familiarity could also affect the neutrality of observers. The experts in Hinds' (1999) study could hardly be considered "neutral" in this sense; with high task familiarity meaning that their predictions were based predominantly on their own (biased) memories and intuitions. In this vein, Weick and Guinote's work on power suggests that this could also compromise observer neutrality.

Similarly, the motivation for fast completion can also compromise observer neutrality. A study by Buehler and Griffin (2009, as cited by Buehler et al., 2010a) found that

when presented with incentives for the actor to complete the task early, observers exhibited an optimistic bias in their predictions not present in the control group. This implies that when motivated to hope for a short completion time, observers encouraged to employ a more actor-like mindset; focusing more on optimistic future plans and less on potential obstacles and past records. This shows how previously 'neutral' parties can change their cognitions to justify their optimism when motivated to do so. Thus, in an organisational context, consultation with individuals working on the same project would generally not inject objectivity into the prediction, since team members have shared cognitions and motivations (Buehler et al., 2005).

Buehler, Griffin, Lam and Deslaurier (forthcoming, as cited by Buehler et al., 2010a) found an alternative to bringing in neutral observers to make predictions. They found that while people typically adopt a first-person perspective in prediction, adopting a third-person perspective when making predictions can elicit cognitive processes that are closer to those of neutral observers than actors. Taking a third-person perspective reduces the tendency to focus predominantly on optimistic future plans and increases the consideration of potential problems and other external factors, leading to increased (and hence more realistic) task completion estimates. Furthermore, the third-person perspective also reduces the tendency to adjust predictions due to any prevailing motivation to finish quickly. In short, an individual employing a third-person perspective acts in close accordance with how a neutral observer would act.

Roy et al. (2008) also found support for their notion that correcting memory can improve the accuracy of time prediction. In three experiments, participant predictions were consistently more accurate when they were provided with actual durations of previous completion times compared to when they were asked to generate their own estimation of these. This is consistent with the memory bias argument. However since the supply of feedback was the only manipulation, this may have been quite a heavy-handed intervention. Participants might therefore felt obligated to use the information because it was explicitly provided, which would be consistent with Buehler et al.'s (1994) explanation.

Important to note is that these experiments involved relatively short and closed tasks. For this reason, Roy et al. (2008) acknowledge that the interventions used here might not hold in longer and more complex real-world instances. These are much more susceptible to interruption, competing time constraints, and other external obstacles. Nevertheless, it could be argued that providing correct historical information to project planners should not generally be a costly practice. Considering the evidence for memory bias in cognition, the benefits for this could be reasonably expected to outweigh the costs, particularly in instances where planning accuracy is of higher importance. Providing such information should also help with the inclusion of distributional information in prediction, regardless of the extent of memory bias.

Finally, both Byram (1997, Study 1) and Newby-Clark et al. (2000) attempted counter scenario thinking and improve prediction accuracy though use of multiple scenarios (optimistic, best guess and pessimistic). All studies found that these manipulations had no significant effect, with people tending to make overly optimistic predictions regardless of the type of scenario(s) they developed. Further, even if the pessimistic scenarios were deemed substantially more plausible they still appeared to have no influence on actor prediction (Newby-Clark, 2000). In contrast, observer predictions were influenced by both the scenario with which they were presented and its relative plausibility (Newby-Clark et al., 2000). This research is consistent with the notion that even when negative potential obstacles and alternate scenarios are brought to light, they are often disregarded by actors as unlikely or inconsequential, regardless of their plausibility.

However, since this cognitive tendency to overlook negative and accentuate positive aspects to justify and maintain optimism is particularly strong, these negligible finding could perhaps be due to the strength of the manipulations. Buehler et al. (1994) found that only under an extreme manipulation – where they were requested to formulate (in writing) a hypothetical scenario that directly incorporated their past experiences, then use this in formulating their current prediction – did people's past experiences (and alternate considerations) actually affect their current prediction. Similarly, Connolly and Dean (1997) found that when individuals were explicitly asked to imagine an extreme

(yet plausible) outcome they were inclined to allow a wider range of feasibility in their predictions.

In contrast, simply asking people to recall and consider past experiences proved insufficient. Individuals are be particularly apt at disassociating past experiences, pessimistic future outcomes and potential obstacles from their present predictions (Buehler et al., 1994; Byram, 1997; Connolly and Dean, 1997; Hinds, 1999; Newby-Clark et al., 2000). Very strong manipulations are therefore needed to counter such strongly embedded cognitions.

In sum, the planning fallacy literature provides a dense foundation upon which to base an investigation into optimistic bias in scheduling organisational projects. This research will now attempt to identify some of the more pertinent cognitive, motivational, and environmental variables of optimistic prediction bias in the MNC planning context, and subsequently derive suitable recommendations to address these based on the relative success of prior debiasing attempts.

# 3. Research Method

## 3.1 The Research Approach

This chapter aims to introduce the general research methodology decisions made in this thesis. The bulk of the existing literature on the planning fallacy aims at advancing and refining the theory by establishing further causal mechanisms under varied laboratory conditions. These laboratory studies primarily involve the comparison of prediction times between different sample conditions under different manipulations. However, because this research is concerned with the application of these theoretical findings within a multinational organisational context, the focus is different. The purpose is not to contribute or redefine the underlying causes of the planning fallacy per se; but to determine which are the more important mediating variables for the planning fallacy in the empirical world.

Because the application and evaluation of planning fallacy theory in the multinational project-planning context is a fairly novel research area, the methodology should be explained and justified clearly and in sufficient detail. Consequently, this Research Method chapter delves into fairly specific detail in some areas, with the hope of developing and justifying a more general template to enable future research to further examine the planning fallacy in the empirical world. Thus, the provision of suggested research methods for exploring these concepts in practice is a key contribution of this research.

The case study, or the examination of a phenomenon "*in its naturalistic context, with the purpose of "confronting" theory with the empirical world*" (Piekkari, Welch, and Paavilainen, 2009, p569), is hence by definition a suitable research strategy for this purpose. A single case – the Global Development (GD) function of KONE Corporation – is selected and examined holistically to enable the exploration of different levels where the planning fallacy may occur. GD is the IT support and global strategy implementation function within KONE. Its primary objective is to harmonize the IT systems globally, thereby facilitating the implementation of a common "KONE Way" methodology to yield cost and efficiency benefits from an increasingly global MNC.

A mixed methods approach will be adopted, consisting predominantly of qualitative analysis along with some simple quantitative analysis. The use of case-based interviews is considered to be the most suitable qualitative method for attempting to gauge the most important variables of the planning fallacy in the MNC context.

Overall, the research methodology is based upon solid theoretical foundations that guided much of the initial research decisions, although allowances for scope flexibility are granted by the holistic nature of the study. The application of established theory in a novel context is indicative of a fairly positivistic approach (Yin, 2009), and accordingly the research methods were initially based quite stringently on the existing theory outlined in the literature review. Accordingly, the initial research boundaries are based primarily upon the deduction of existing theory. However, the methodology deviates somewhat from positivist assumptions through the investigation of emergent issues and the acknowledgement that results could potentially be influenced by subjective interpretation.

A methodological complication is that due to the wide range of possible planning fallacy variables, the research methods applied here should be more suitable for identifying and examining certain types of these variables. For example, employee motivations are intuitively more readily obtainable from qualitative interview than the presence of anchoring and adjustment processes or the prevailing conceptualisation of time. Thus, the factors that are not as easily identifiable by interview are less likely to be included in the findings as 'prominent' planning fallacy factors. To address this, the recommendations of this research will include some suggestions for addressing these less-identifiable biases, since theory posits that they should exist in some capacity.

This chapter will now attempt to justify the choice of research methodology used to achieve these research goals. Rather than include a separate section for the reliability and validity of different aspects of the research method, these issues are addressed throughout the chapter within the relevant sections. It will commence with the justification for the suitability and selection of the specific case. This will be followed by a description of the research approach and data collection methods used, focusing more specifically on the goals and challenges of the interview process. Finally, the

methods of data analysis, the possibility of researcher and sample biases and the capacity to draw general conclusions from this research will be discussed.

## 3.2 Research Design

This chapter will present justifications for the choice of research context, design and case selection based on their consistency with the research aims and the literature. It will first establish why the multinational context is suitable for examining, testing, and extending planning fallacy theory in the empirical world. The choice of research design will then be outlined and explained, followed by a justification of the selection of the case itself.

### 3.2.1 The Use of the MNC as a Research Context

A common approach in studies using the MNC as a research context is to "*incorporate additional context-specific variables into existing models in an effort to better capture the phenomenon at hand*" (Roth and Kostova, 2003, p886). In doing so, the basic explanatory mechanism of the theory is unchanged, although additional variables can further complement the existing model by introducing further complications and hence a deeper understanding of the phenomenon.

This is the approach taken here, with the planning fallacy applied to planning in a multinational organisational context. The underlying mechanisms are the same, although the international environment introduces additional complexities that increase the possibility of external obstacles and interruptions to project completion, thereby increasing uncertainty in prediction. In this case, projects involve rollout phases where purposely developed IT systems are introduced and adopted by front lines in most (if not all) local subsidiaries. Each country consequently has its own specific challenges stemming from cultural distances, country-specific disruptions, time and working hour differences, local requirements for tool and system customisation and extent of buy-in/acceptance enthusiasm. Thus, the author posits that the planning fallacy should be even more pronounced in the multinational context due to the additional external variables introduced by the international dimension. It could reasonably be argued that addressing the planning fallacy should hence be more important in an organisation that transcends national borders.

Roth and Kostova (2003) suggest that the additional complexity in the MNC environment arises due to both the inherently greater intraorganisational complexity and individual variability. Based on their cultural background, country of residence, and individual attributes, individuals are expected to have different expectations and different ways of working. However, in accordance with the finding that the difference between individual cognitions in making first-person predictions was found to be negligible across cultures (Buehler et al., 2000; 2003, as cited by Buehler, Griffin and Ross, 2002, Buehler et al., 2010a), one thing that is expected to be globally consistent is the propensity to exhibit optimistic biases in prediction.

Consequently, it is the disregard of such additional complexities that is expected to heighten the planning fallacy's impact in an MNC. The mitigation of the planning fallacy in a multinational context should be more complex due to the myriad of additional obstacles and considerations presented by the international dimension. However, on the other hand this means that it becomes arguably more important to shift the focus toward these potential obstacles and away from the intuitive inside perspective. It also means that the improvements in planning accuracy could be far more significant when debiasing techniques are applied in a multinational setting rather than in a domestic organisation.

### 3.2.2 The Single Case Holistic Design

Given the robust and global nature of the planning fallacy phenomenon, a clear and detailed conceptualisation of this within a single case study is considered sufficient for the purposes of this research. This is consistent with the notion that a single case study is optimal for a deep and contextualised understanding, (Dyer and Wilkins, 1991; Siggelkow, 2007) as well as McKeown's (1999) argument that a single case study is sufficient to prove the existence of a phenomenon.

Additionally, the conclusions drawn from this research are based upon *analytic* generalizations rather than *statistical* generalizations (Yin, 2009). This implies that research quality, coherence, consistency with established theory, and logically deductive conclusions that deepen the understanding of causal relationships are more important than sheer sample size. For this reason – in addition to the presence of time,

access and resource constraints – a single case study design is considered adequate and appropriate.

The single case was examined holistically to address the questions of *where* as well as *how* the planning fallacy can permeate time prediction in the MNC context. The unit of analysis in a single case holistic research design is the case itself (Yin, 2009). This approach enabled the identification of all individuals and groups involved in the project scheduling process, the subsequent investigation of their respective motivations and cognitions, and the influence of the interaction between them on prediction optimism. This allowed the development of recommendations for all levels where the planning fallacy could arise.

Given the single case design, caution must be exercised to ensure the validity and reliability of the research. The use of a single study also necessitates rigour and diligence in the collection and analysis of information to avoid the pitfalls of misrepresentation (Fletcher and Plakoyiannaki, 2011; Yin, 2009). This risk of misrepresentation is commonly addressed through the triangulation of data collection (Stake, 2005), which will be discussed in detail in Section 3.3.

### 3.2.3. Rationale for Case Selection

The case organisation and specific function were selected based on a complementary mix of representative and selective sampling rationales.

KONE Corporation is considered a representative example of a global multinational, owing to its widespread global reach and the high level of product standardisation and organisational consolidation in the elevator industry. Moreover, the specific use of KONE's GD environment was also selected for research primarily based on its representative qualities (e.g. see Yin, 2009). The cognitive and motivational underpinnings of the planning fallacy mean that this phenomenon is particularly robust, and present in almost any planning activity involving open tasks. Moreover, this case is considered to be a fairly typical organisational unit engaging in internal development projects. Justification for this characteristic rests on its use of the heavily standardised and widely adopted PMBOK methodology (PMI, 2008), the Project Management Institute's (PMI) global standard Project Management Professional (PMP) certification

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requirements for KONE Way project managers, and GD's responsibility for maintaining the IT environment and pursuing the standardisation of processes and IT solutions in a global company.

A second justification is the suitability of the GD environment for examining optimistically biased predictions specifically. KONE Way projects are intrinsically subject to the international dimension, however they face arguably a lower level of uncertainty than comparable functions and organisations. There is some dependence on third parties (primarily in tool and system development) and the extent of this varies between projects, so the threat of external interruption is certainly very salient. However, it is still assumed to be less of a risk in this context than it could be otherwise, since the focus is on internal development projects rather than projects that are run between multiple organisations. This contrasts with, for example, a major construction project that typically faces a substantial risk of being significantly delayed by the failure of one or more of the numerous subcontractors involved (Wang and Liu, 2005).

Projects ranging from between several months and several years are suggested, approved, monitored and controlled within KONE Corporation, and implemented by GD in collaboration with the relevant business functions and foreign subsidiaries (all internal). These types of internal projects could consequently be considered less susceptible to dramatic interruptions from external parties than projects spanning between several interdependent organisations. This is beneficial for the purposes of this research, as it means that the phenomena examined can be examined more clearly as they exist in a more stable (although by no means controllable) environment than do projects that are heavily reliant on input from external parties.

Consequently, GD project managers should have relatively less justification for blaming past failures on external and specific obstacles. Thus, optimistic biases in planning could be arguably easier to identify and more difficult to justify in this environment. This implies a selective sampling rationale (Fletcher and Plakoyiannaki, 2011; Sandelowski, 1995), whereby the case fits the preconceived criteria of providing an international environment that is still undoubtedly complex, yet more manageable than could otherwise be owing to its more internal nature.

## 3.3 Data Collection

This research adopts a mixed method approach to data collection and analysis. Primary data was collected through interviews, which will be discussed in the subsequent section. In addition, a simple quantitative analysis was conducted with the intention of triangulating the findings by substantiating the existence of prediction optimism (Eisenhardt, 1989; Stake, 2005; Yin, 2009). As previously mentioned, such triangulation of data collection methods can help overcome the risk of misrepresentation (Stake, 2005) as well as enhance research validity (Creswell and Miller, 2000). An important stipulation here is that while further evidence of systematic underestimation complements the arguments made, the exact (numerical) extent of prediction biases are not important since this case aims to develop analytic rather than statistical generalisations (Yin, 2009).

This research aims to take well-established psychological theories and test their durability in the empirical world, and determine whether any extensions or modifications are required to establish consistency with the multinational environment. This process of applying developed theories to a different research paradigm (i.e. from psychology to international business) means that the research approach involves fairly tight initial theoretical constructs (Dubois and Gadde, 2002; Yin, 2009). Accordingly, a careful review of the existing theories and the development a fairly tight (predetermined) analytical framework precedes the collection of empirical data. The boundaries of the study will also be quite clearly defined prior to commencing the empirical analysis. This is because the psychological theories being applied are widely accepted and shown to be quite robust within the psychology field, and hence the analytical framework for this case study will be fairly closely based on their prescriptions.

### 3.3.1. Qualitative Interviews

Qualitative interviews are regarded as one of the most potent means for developing a deep understanding of other individuals (Fontana and Frey, 2000; Rubin and Rubin, 2005). The qualitative interview is essentially a "*guided conversation*" (Kvale, 1996; Rubin and Rubin, 2005) and is considered suitable when the objective is to establish

common patterns or themes between particular types of respondents (Warren, 2002). Accordingly, qualitative interviews were deemed the most appropriate method for identifying and examining the cognitions, motivations, and environmental factors that can influence temporal prediction in an organisational environment. The explanatory nature of the research combined with the rich theoretical foundations provides a sound structure for the interview questions. However, the elusive, complex and interrelated nature of the underlying cognitions of optimistic planning biases imply that flexibility is necessary in interviews. Together, these factors deem semi-structured interviews, or an "interview guide" (e.g. see Patton, 2002 p283) appropriate for data collection.

The inherent flexibility of the semi-structured qualitative interview facilitated a degree of overlap between data collection and data analysis. This meant that an understanding and refinement of the interview process itself evolved over the course of data collection. This approach enables emergent themes and opportunities to be explored, and allows the case to continually evolve over the course of data collection (Dubois and Gadde, 2002; Eisenhardt, 1989). Dubois and Gadde (2002) suggest that this approach helps facilitate the matching of theory to practice and the identification of possible theoretical gaps or inconsistencies. Moreover, any new insights gained from early interviews could be expanded upon, integrated and examined more closely into later interviews.

Furthermore, the reasonably staggered scheduling of interviews also enabled this progressive examination of the data collected, thereby facilitating the espoused overlap between data collection and analysis. Thirteen interviews were conducted, and the schedule was fairly evenly distributed over a three-week period. All interviews but one were digitally recorded with the permission of the interviewee, and notes were also taken. As Patton (2002) suggests, the recording of interviews enables the researcher to concentrate more on the interview itself and enhances the accuracy of data collection. The interviews were carried out face-to-face where feasible to allow the interviewer to pick up on interesting issues that might arise or be alluded to by the reactions or demeanour of the interviewees. Face-to-face interviews are widely regarded as the most suitable frame of interaction for qualitative interviewing (Warren, 2002), owing particularly in this instance to the more natural context, a deeper understanding between interviewee and interviewer, greater likelihood of self-generated answers, and greater

effectiveness with complex issues (Shuy, 2002). Ten out of the thirteen interviews were conducted face-to-face, with the remaining three conducted via telephone.

This chapter will subsequently summarise three important aspects of the interviews in detail: the interview structure, the selection of interviewees, and the limitations of data collected via interview and how these were addressed.

### 3.3.1.1.Interview Structure

The interviews attempted to identify the cognitions or lines of thought that are most easily brought to mind during the planning process. Consequently the use of suggestions and examples that might obstruct or manipulate the thought processes of interviewees was intentionally minimised. Interview questions were intended to be as broad and non-specific, as possible to avoid the risk of priming interviewees with suggestions or examples.

An interview guide provides some scope for adaptability and responsiveness whilst ensuring a consistent direction and the optimal use of time (Patton, 2002). It also facilitates the inclusion of additional factors that could arise during the interview which were not identified in advance. Although some variance in data could result from the differing lengths and depth of interviews, the flexibility allowed by the semi-structured design is considered more important for the purposes of this research. Broad and encompassing questions were posed, and additional detail was then extracted via probing and requests for clarification or elaboration.

A brief explanation of the general research aims and purpose of the interviews was provided to the interviewees several days in advance. This was intended to help them understand the research area, without providing too specific information that could result in pre-formulated responses. The interviews lasted between 40 minutes and two hours and ten minutes; depending on the time constraints of interviewees, how forthcoming they were, and the communication medium. Face-to-face interviews were generally longer than telephone interviews in the absence of prominent time constraints. This is presumed typical of qualitative interviewing, attributed by Shuy (2002) to the inherently greater interactive naturalness of the face-to-face context. Consequently, the different areas of research were prioritised to ensure the information most appropriate

and accessible from interviews was gathered first. In accordance with the limitations mentioned below, the interviews primarily aimed to gather information on the more tangible and less ambiguous planning fallacy variables, and then delve into the more abstract, complex, and evasive areas afterward if time allowed.

Thus, the question order was carefully considered prior to interviews, and also refined over the course of data collection the process. Initial questions concerned elements considered to be more tangible and easier to bring to mind, and helped the interviewee "warm up". These included questions about background information, the social interactions and motivations of individuals involved in the time planning process, and their perceptions regarding pressures for speed in completion from stakeholders and other sources. This proved to be an appropriate starting point, with these areas appearing to be the most straight forward, the easiest for the interviewee to bring to mind, and the least susceptible to post-hoc rationalisation or attributional biases. These were followed by questions regarding the cognitive processes and environmental influences that were less salient and more difficult to articulate. Specific measures taken to address these attributional process are discussed in detail in section 3.3.1.3.

### 3.3.1.2. Interviewee Selection

Thirteen suitable candidates were identified as suitably for interviewing based on the quantitative analysis of archived data (discussed in section 3.3.2.), the nature of the projects managed, and consultation with the Program Management Office (PMO). Among these were ten current project managers, two program managers (formerly project managers), and one manager from PMO. This is consistent with a theoretical sampling strategy (Warren, 2002), whereby interviewees thought to be representative of the population were identified and selected. Candidates were approached in person or via email, and all agreed to the interview. The reasonably high number of interviewees resulted in some degree of data saturation and redundancy; considered by Stake (2005) to be another means to counter the risk of misrepresentation.

Each interviewee contributed to an overall diverse sample, and so project managers with particularly solid track records were mixed with those that had experienced more deviation between plans and reality. Further, the sample included those that had clearly

demonstrated the inclination toward predicting relatively shorter durations for future rollouts along with those that did not display this inclination to the same extent. Interviewees also had varying degrees of experience in project management, ranging from two to ten years.

### 3.3.1.3. Limitations of Data Collection from Interviews

Three key limitations have been identified with data collection from interviews in this research context. Firstly, planning fallacy theory directly predicts that any attempts at explaining the past should be inherently biased, and hence potentially unreliable. Secondly, trying to decipher the dominant planning cognitions from planners could prove difficult given the symbiotic nature of these cognitions in a real-life context. Third, a substantial amount of trust needs to be built between interviewer and interviewee to encourage interviewees. This should increase the likelihood of the interviewee relaxing and perhaps shedding light on some of the more subtle yet important aspects of the planning process.

One of the principal challenges of collecting data via interviews in this case is post-hoc rationalisation; whereby the interviewee's account of the past is a subjective and hence potentially biased interpretation. This is particularly pertinent here since planning fallacy theory explicitly *expects* that individuals will attribute past inaccuracies in time prediction to specific and external factors (Buehler et al., 1994; Lovallo and Kahneman, 2003). As mentioned above, this was expected to permeate some areas of the interview more than others.

Consequently, there are some things that cannot be credibly expected from interviews with employees directly involved in making predictions, such as objective explanations for their own past failures in temporal planning. Based on research by Buehler et al. (1994; 2000; 2003, as cited by Buehler et al., 2002; 2010a) and Lovallo and Kahneman (2003) it was expected that people (particularly those from Western cultures as in this case) would rarely accept personal responsibility for these. For this reason, interviewees were only asked to recount their own past problems and delays, but also to describe and explain problems that they have observed reoccurring (perhaps outside of their area of responsibility). Furthermore, instead of focusing only on the past, the interview

questions also tried to investigate the cognitive focuses of interviewees engaging in current planning.

In terms of Patton's (2002) categorisation of question types, this entailed the balancing of *experience/behaviour* questions (which were expected to exhibit some post-hoc rationalisation biases) in favour of *opinions/values* questions. The aim of this is to look for any evidence of the cognitive biases underpinning excessive optimism in prediction. Furthermore, considerable thought was given to the wording of interview questions to ensure that they probe for evidence of the existence of optimistic planning biases without referring to them directly.

In addition, the inclusion of the PMO manager in the interviews was intended to help sidestep these biased historical reflections, in accordance with the research on neutral observers (Buehler et al., 1994; 2010a; Newby-Clark et al., 2000). One of PMO's core responsibilities is to manage the project portfolio, for which temporal prediction accuracy across all projects becomes particularly important. Furthermore, since this particular interviewee is not directly involved in the prediction process, they should not share the motivation to attribute past failures to one-off interruptions and should therefore contribute a more objective account of the past.

Secondly, the empirical organisational context is infinitely more detailed and complex than a laboratory setting where study participants are assigned a simple prediction task under certain conditional manipulations (Buehler et al., 2003; Roy et al., 2008). Consequently, descriptions of specific thought processes that do not exist in isolation are expected to be more difficult for both the interviewee to comprehensively articulate and the interviewer to capture. This is because the different cognitions that are adopted in planning were anticipated to be less salient and more difficult to bring to mind compared with, for example, an account of who the project manager typically consults with when developing predictions.

Moreover the mental separation and individual evaluation of the multitude of considerations in complex and multifaceted projects could be cognitively taxing. Data of this type is perhaps better obtained by observation rather than interviews, however such observation in real world circumstances is likely to require time and resources far

beyond those available for a master's thesis. Unless certain laboratory-like conditions are introduced to the research process, it is anticipated that trying to get a straight and objective (unbiased and not ad-hoc) answer from interviewees regarding what exactly they focus on in planning and to what extent could present considerable difficulties.

In addition, most of the interviewees were project managers who may not appreciate the inherent implication of the research that they could exhibit delusional optimistic biases in planning. This information was not explicitly divulged, with the purpose of the interviews being to "explore the thought processes, motivations, and environmental influences that arise during time planning".

Finally, both the relationship between the interviewer and interviewee and the condition of interviewee anonymity were carefully considered before conducting the interviews. The researcher had worked with the case company during 2010, during which time had already then built up some trust and a good working relationship with many of the project managers. This is considered beneficial for the interview process, as individuals are typically more forthcoming when the interviewer has established rapport and a gained a degree of trust with them (Fontana and Frey, 2000).

The condition of anonymity was also considered beneficial for the quality and validity of the data collected through interviews. Interviewees were assured that they would not be individually identified in the research, to minimise the risk that they might alter their "on the record" responses for fear of damaging their reputation (Warren, 2002). Because the research is not investigating the interviewees as individuals, but rather as an example of the project manager or the MNC employee, the identification of the individual interviewee is considered unimportant for the findings. Moreover, the key benefits of the research (for example that recommendations for how to better support project managers would be derived from the findings) were communicated to the interviewee prior to the interviews. This created a motivation for them to yield more information. For these reasons it can be reasonably assumed that interviewee responses are honest and reliable.

In sum, the inherent limitations presented by both the nature of the phenomena being examined and the research resource constraints, had implications for the design of the interview process and hence the quality of the data collected.

### 3.3.2 Quantitative Data Collection – Rollout Comparison

Quantitative analysis was also conducted using archived longitudinal temporal planning data to attempt to empirically support the existence of the optimistic bias and the planning fallacy in practice. Buehler et al. (2010a) posit that two things are required to prove the planning fallacy's presence:

"*First, predictions of current task completion times must be more optimistic than beliefs about the distribution of past completion times for similar projects; second, predictions of current task completion times must be more optimistic than actual outcomes. A high degree of confidence is also diagnostic, but is not required by the classic definition*" (p4).

This means that longitudinal empirical data is required to establish the existence of the planning fallacy in practice, since current predictions need to be compared with both past and actual (future) outcomes. However, this quantitative analysis is limited to cross-sectional data, meaning that the present predictions cannot be compared with the actual outcomes to prove that they were underestimations. Consequently, the focus of this analysis is restricted to searching for a tendency to predict that future rollouts will be shorter than past and present rollouts; i.e. testing for Buehler et al.'s (2010a) first condition of the planning fallacy.

Thus, although this analysis can illustrate phenomena consistent with the presuppositions of optimistic bias and the planning fallacy, it can by no means provide concrete evidence of either of these. This analysis was performed simply with the intention of complementing the qualitative research with some supporting quantitative data. Findings were also used to identify suitable candidates for interview, where their inclinations for displaying biased cognitions and perceptions of pressures and motivations could be gauged specifically.

### 3.3.2.1 The Rollout Duration Comparative Analysis

Projects typically run over one to several years in total, and project environment is complex and interrelated. Consequently, an investigation into the time overruns that occur over the course of the project presents longitudinal data over an extended period that is subject to a myriad of complexities and interruptions. The planning fallacy is arguably one source of deviation between predicted and actual plans, however the degree of difficulty in untangling its influence from the multitude of other interrupting factors positively corresponds with the length of the duration that is examined. Thus, unravelling and isolating the influence of prediction bias on time overruns over the course of an entire project specifically would be a complex and tedious process, surrounded by considerable ambiguity and uncertainty.

For this reason, this analysis has identified one specific project phase that provides a convenient and suitable context for examining the planning fallacy: the *rollout* phase. KONE Way projects are separated into ten separate phases, or *milestones*. The rollout is the last phase, entailing the implementation, training and initial support of the developed tools into all relevant units worldwide. This phase begins after the tool implementation has first been developed and then tested in a pilot country, so project managers already have some relevant experience prior to its commencement. The stage is completed once the tool rollout has been completed in all relevant units. Thus, the time planning for the ongoing rollout phase illustrates the duration of completed (actual), ongoing, and planned (predicted) rollouts for a given project. The planning fallacy theory posits that the predicted duration of future rollouts should be consistently shorter than the actual durations of both completed and ongoing rollouts.

Cross sectional data was collected and the durations of completed and ongoing rollouts were compared with the predicted durations of planned rollouts. This was done through comparisons of the mean and median durations, so identify whether there is a tendency to base predictions for the future on past and present outcomes. Ten projects were identified as suitable for this, and the analysis of their plans is presented in Appendix B. To protect sensitive information, the names of the projects have been changed, and the units of measurement have not been specified. This should not impact the results, since

the ratios (rather than the actual time units) are considered to be the important output here.

### 3.3.2.2 Limitations and Quality of the Data

As indicated above, the key limitation of such a comparison is that this involves cross-sectional rather than longitudinal data. This was the case due to limitations in data availability. This means that not only can predictions not be compared to their actual outcomes (a condition of proving the planning fallacy's presence), the cross sectional data does not account for the extent of completion of the rollout phase.

Another limitation that could potentially impact data validity is the differences in country complexity (as there is some variation in the past, ongoing and future rollout units between countries). There are clearly inherent differences between the countries in which the tools are implemented; that is, some countries present more complex environments for implementation due to their relatively greater cultural and psychic distances from Western and Northern Europe (where the projects are typically formulated and scheduled) and unique languages. Rollouts in these countries would naturally take relatively longer. These differences in country complexity are difficult to account for, so in the absence of detailed parameters that would facilitate comparison one must simply acknowledge that such differences exist.

Additionally, the durations of ongoing rollouts are comprised of both actual and predicted components. This ratio of actual to predicted duration was not controlled for in the analysis, since the use of cross-sectional data and restricted sample size limited the extent of manipulations that could be accomplished here. This lead to the inclusion of a completed vs. planned rollouts comparison as well as combined completed/ongoing vs. planned.

Finally, the quality of the data might be compromised somewhat if the plans held some inaccuracies due to not being kept up to date, incomplete or because of human inputting error. To account for this, rollout plans exhibiting significant irregularities were excluded from the sample.

These limiting factors could be somewhat moderated by increasing the sample size, however the limited number of GD projects in their rollout phase makes further sample expansion impossible here. Fortunately, for the purpose of this analysis it is more the directional relationships, rather than the exact figures that are important.

## 3.4 Data Analysis and Interpretation

### 3.4.1 Qualitative Analysis

This research employs inductive reasoning to guide the interpretation and analysis of interview data. The intention of the Results chapter is to present a meaningful narrative of the project management environment, with the Discussion chapter then explicitly identifying possible areas of bias within this environment based on the existing theory.

The rich theoretical foundations meant that preliminary thematic coding could be conducted based upon *a priori* coding units (Neuendorf, 2002; Stemler, 2001). These coding categories were pre-established systematically in accordance with the existing theory. However, although these largely predefined categories guided the general direction of the research, a degree of flexibility was allowed to facilitate their revision and reorganisation, as well as enable the incorporation of some *emergent* coding units. These emergent categories arose primarily from practical problems and recommendations suggested by interviewees, facilitated by the overlap between data collection and analysis discussed above. The formulation of emergent categories required some preliminary examination of the data (Neuendorf, 2002; Stemler, 2001), and the researcher's increasing familiarity and deepening understanding of the case environment also enabled the progressive revision of category definition.

The Results chapter aims to integrate and sequence the empirical data collected in a way that is considered to provide a clear and coherent description of the project management environment. Quotes considered to be representative of the sample rather than illustrative of an individual perception (as prescribed by Charmaz, 2002) were selected and integrated into the text to deepen the description. This set the foundations for the conceptual categories to be thoroughly examined in the Discussion chapter, and integrated into a theoretical framework that aims to explain the phenomena overall.

### 3.4.2 Quantitative Analysis

Quantitative data was analysed through the comparison of mean and median durations of completed, ongoing, weighted completed/ongoing, and planned rollouts from the sample projects. As mentioned above, this is intended to supplementing the qualitative findings by establishing directional relationships through the identification of general patterns in the deviation between actual and predicted durations. Establishing some systematic tendency to perceive the future as 'brighter' (more favourable) than the past should contribute to the triangulation of empirical findings in this research.

## 3.5 Researcher and Sample Biases

It must also be acknowledged that this research itself is susceptible to biases. The key potential biases here that could potentially influence the findings and conclusions drawn are the biases of the researcher himself as well as possible sampling biases.

In this context, researcher bias could potentially lead to exaggeration of the findings. Some subjectivity in the interpretation of interview data is seemingly inevitable with qualitative research, owing to the biographical and disciplinary perspectives of the researcher (Warren, 2002). Moreover, since the researcher's core objective here is to establish and discuss the presence of optimistic bias in an organizational context, there could be an inherent predisposition to (perhaps disproportionately) attribute planning failures to optimistic prediction bias.

This acknowledgement of the possibility of researcher bias is indicative of a somewhat constructivist approach, which suggests that the researcher cannot be completely removed from subjective interpretation and conflicts with the positivist notion of a single objective reality (Charmaz, 2002). This implies that in such a complex research environment, the "true" contribution of optimistic bias to planning inaccuracy will always remain elusive. There are always disruptions and inaccuracies in project management, and all temporal estimations are inevitably surrounded by some degree of uncertainty. Consequently, there are an infinite number of possible reasons for scheduling inaccuracies, optimistic bias being but one of them. However, since the purpose of the research is simply to identify the areas in which optimistic bias could affect prediction – rather than explicitly attribute a clear and measurable proportion of

temporal planning inaccuracy to optimistic biases – such predispositions and the risk of researcher bias is not considered to be a problem.

In addition, since the overwhelming majority of individuals interviewed were project managers, this could introduce some sampling bias into the findings. While the author attempted to maintain a fairly balanced account, the results could still be skewed somewhat toward placing excessive blame on others within the organisation for scheduling inaccuracies (such as upper management). Accordingly, it must be recognised that the results and description of the project management environment somewhat represent the perceptions of project managers. However, this is considered beneficial for the research itself, since the intention is for the results and recommendations to be presented to upper management. It is beneficial for them to acknowledge the project manager's perspectives and interpretations of the organisational environment.

Therefore, while this research should be read with these potential biases in mind, they are not expected to detract from the purpose of the research: i.e. to identify and rectify possible areas of concern with respect to optimistic bias in a multinational organisational environment.

## 3.6 Drawing Conclusions and Generalising Findings

After analysing and interpreting the data collected using the process described above, conclusions were drawn based on consistencies and discrepancies with the underlying theory. Despite Stake's (2005) espoused challenges associated with generalising results from single case studies, the conclusions reached are intended to be reasonably generalisable for similar MNCs and organisations. The rationale for generalisability is based on the representative qualities of the case outlined above, as well as the robust, universal and indiscriminate nature of the planning fallacy outlined in the literature (e.g. Buehler et al., 2000; 2003, as cited by Buehler et al., 2002; 2010a).

Overall, the positivist aspects of this methodology and the deductive approach employed to guide data codification in this research mean that it is inherently limited by any limitations in the theories upon which it is based. Firstly, anything controversial or misguided in the existing theories could permeate the data collection. However, this is

unlikely since there is widespread agreement in the literature on the set of fairly robust concepts. Secondly (and arguably more importantly), any unknown omissions from the existing theoretical constructs would also be absent from the initial interview questions, since these were guided by the literature. As discussed throughout this chapter, this general limitation is addressed by both rigour and flexibility in the research methodology.

# 4. Results

This chapter aims to present the empirical findings of the research. This entails description of the case environment, focusing specifically on the key project management considerations along with the environmental aspects that could potentially relate to optimistic bias in prediction in accordance with the planning fallacy literature. The objective here is to describe both the important variables that can influence the project duration as well as the way in which temporal predictions are generated, as these are considered interrelated and possibly bias-inducing. Thus, the chapter is organised in a way that provides an overview of the variables and challenges that project managers typically consider and encounter when planning organisational projects, with an implicit emphasis on the more prevalent potential bias-inducing aspects.

The literature reviewed in the second chapter provided a lens through which the case environment was examined and evaluated, so that the empirical findings discussed could be related back to the existing theory in the subsequent (Discussion) chapter. Owing to the nature of the empirical environment and the research methodology employed, some contributing variables of optimistic bias will feature more heavily in the ensuing analysis than others. Thus, while some of the variables discussed in the Literature Review were not readily identifiable within this research, they could still yield a potential influence on optimistic biases in the empirical setting, and provide some direction and implications for future research in this area.

An important initial point in this description of the case environment is that overall there could exist an inherent tendency for 'best-case scenario' planning; or the intuitive component of the inside perspective outlined in the Literature Review. One project manager summarised the tendency to plan for the optimal outcome:

*"As a project manager, when you do an estimate you do an ideal estimate, and I think we should be a little bit more realistic." (Interviewee I, 2011)*

Furthermore, both the mean and median comparisons in the quantitative analysis revealed that predicted rollout durations were consistently significantly shorter than

both the completed and the combined completed/ongoing actual durations. Future (planned) rollout durations were estimated to be around 30% shorter than past (completed) durations, and around 36% shorter than the weighted average of completed and ongoing durations. See Appendix B for a complete overview of the analysis, along with individual project rollout graphs. Such a consistent pattern in the results supports the assertion that there exists a natural inclination to perceive the future as intrinsically more positive than the past exists in the case organisation.

This chapter hence aims to describe various aspects of the empirical environment that could help explain, exacerbate or mitigate this apparent tendency for over optimism in temporal prediction. Thus, the intention is to depict the predominant planning considerations and aspects of the case environment that could moderate the human inclination toward scenario thinking. As will become clear over the course of this chapter, best-case plans tend to prevail in temporal estimations when key planning variables are not fully understood or considered in prediction. Additionally, differences in power and expertise, as well as social interaction within the organisation, can be linked to the tendency for optimism in prediction. The empirical findings described in this chapter will then be discussed, elaborated upon and linked with existing theory in the ensuing Discussion chapter.

This chapter will first provide a description of the case organisation and project management environment, including an overview of the scheduling methodology utilised in KONE Way projects. Thereafter, it will outline and synthesise the results obtained from the interviews. This analysis is primarily divided into two separate areas: First are the considerations and challenges encountered at the project level that have the potential to impact both the duration of a project and the propensity for optimistic biases to permeate the estimation of this duration. Second are the challenges and environmental influences that arise beyond the project level, which can both impact the project's actual duration as well as exert an influence on the project schedule. The chapter will conclude with a summary of the most pertinent aspects and challenges of the project-planning environment with respect to temporal underestimation.

Quotes from ten of the interviewees are integrated into the text to exemplify and enrich the descriptions of empirical findings. Interviewees are distinguished by number (in Roman numerals, from I to X) based on the order in which their quotes appear in the text. In addition, where the identification of a specific country is considered irrelevant for conceptualising the results, the countries used as examples in quotes from interviews will be referred to as "Country A". This is to respect the sensitivity of country-specific information. The real country name will be used if it is considered directly important in conveying the point, so this practice is not considered to impact the results.

## 4.1. Description of the Case

A broad understanding of the case environment as well as a more detailed understanding of some relevant aspects of the project management context is particularly important in developing an understanding of the specific motivations of individuals and groups that can influence the schedule of KONE Way projects.

This section will provide an overview of the case environment. This will first entail a general introduction to KONE Corporation, followed by a description of the Global Development (GD) function. The KONE Way project management methodology employed within GD will subsequently be discussed, focusing predominantly on the different project milestones. The results gathered from interviews and presented in this chapter will be concentrated primarily within the development and rollout phases, since these are where the planning fallacy is considered most likely to manifest.

### 4.1.1. KONE Corporation

KONE Corporation is one of the world's leading elevator and escalator companies. The company provides elevators, escalators, and automatic doors for new buildings, as well as solutions for the modernisation and maintenance of existing products. Founded in Finland in 1910, KONE currently operates through over 1,000 offices around the world (KONE Corporation, 2010b). In 2010, KONE had approximately 33,800 employees and annual net sales of almost EUR 5 billion (KONE Corporation, 2010a). This was comprised of 46% new equipment sales, 37% maintenance activities and 17% modernisation activities (Ibid, 2010a).

KONE has grown significantly over the past four decades to become a global leader in the industry. The elevator and escalator industry requires little local differentiation, allowing for significant benefits from global alignment to be attained. The pursuit of this corporate level strategy involving a high emphasis on cost reduction through economies of scale and a low degree of local customisation is consistent with Bartlett and Ghoshal's (1989) Global MNC typology. Accordingly, as KONE's growth was predominantly achieved via acquisition, one of the most significant challenges the company faces is the global alignment of processes, including the standardisation of high quality, competitive, and customer focused offerings worldwide.

### 4.1.2. The Global Development Function at KONE Corporation

KONE's Global Development (GD) division leads the development, implementation and support of KONE Way processes and solutions together with the Business units. '*Business units*' here refers to the local (geographical) subsidiary units of KONE Corporation, as well as other relevant business functions. The '*KONE Way*' is the way of doing business in KONE with respect to customer relations, the delivery of projects and services, the creation of new solutions, and the management and support of these activities. These KONE Way processes are embedded in the policies, systems and tools in KONE Corporation. The core objectives of the KONE Way are to remove overlaps in different process areas to improve productivity, clarify responsibilities, and enhance collaboration between functions, as well as to facilitate improvements to customer satisfaction and enable market expansion.

GD is therefore a key player in the implementation of KONE Way process solutions. GD is responsible for the KONE IT environment, constantly developing and rolling out new solutions such as software and IT tools into local units worldwide. This is in pursuit of cost and efficiency benefits from system harmonisation and the global standardization of tools and work practices, which contribute to the broader objectives of improved business performance and strengthened customer loyalty.

This is a particularly formidable challenge in an organisation that grew predominantly by acquisition, since there are vast differences between subsidiaries. The process of software design and global rollout must therefore be carefully planned and coordinated

to promote efficiency and effectiveness. Consequently, the development and implementation of KONE Way solutions are organised as internal development projects. Moreover, the fact that KONE Way projects require the cooperation of various Business units introduces additional complexities into the project-planning environment.

Increased accuracy in project planning is beneficial for work within these internal development projects as well as the coordination between projects. As established in the Literature Review, the accuracy of plans within individual projects can have significant implications for the management of the portfolio overall (Elonen and Artto, 2003; Martinsuo and Lehtonen, 2007). In this case, there are significant interdependencies between ongoing projects, particularly with respect to resources. In this case, "resources" refers to human resources, i.e. the KONE and external employees that are working on multiple projects. KONE employees generally work on multiple projects at once, and there is a limit to the number of projects that can exist in the portfolio at a given time. Consequently, project delays have a "knock-on" effect at the portfolio level; whereby inaccuracy in the planning of one can affect the timing and coordination of all projects in the portfolio as well as delay prospective projects that are due to start in the future.

Therefore, the multitude of interdependencies between internal development projects in a multinational organisation increases the importance of planning accuracy, since the implications of inaccuracy transcend the individual project. However, interdependencies also imply similarities, which could increase the amount and availability of relevant distributional information for use in planning.

An important aspect of internal development projects is the relative size of the project within the portfolio; which is often positively related to the extent to which it overlaps with or replaces existing (legacy) solutions in the local environment. The biggest tool/system developments, with more extensive and complex rollout processes are organised as programs, with individual rollouts often being organised as separate projects within the program. These have greater complexity, although have arguably

greater schedule flexibility due to the greater number of work resources and higher relative prioritisation.

At the other end of the scale are smaller projects that might last around one year. These involve a lower level of complexity, typically implementing tools that do not impinge on legacy systems to the same extent. This means that the rollout process is comparatively faster and simpler. However these projects do not have the same level of prioritisation as the top projects, meaning that there is a greater risk of potential disruption due to resource constraints and reallocations. Moreover, there is less flexibility in the schedule, since with a smaller project there is less capacity for compromise and trade-offs. For example, a larger project might be better equipped to address an urgent issue in one rollout country due to the greater amount of project resources available to be temporarily reassigned to it.

### 4.1.3. The Evolution of the KONE Way Project Management Methodology

As noted in the Introduction, the KONE Way methodology has undergone significant extension and refinement over the past few years by GD's Program Management Office (PMO), whose responsibility it is to support and facilitate the management of internal development projects. These improvements focus primarily on the tangible planning practices, which would be sufficient under the assumption that individuals acted perfectly rationally and objectively when predicting future outcomes. However, as established in the Literature Review, the way the human mind processes information, individual motivations, and the surrounding environment can all introduce subjectivity into predictions. Consequently, this section will aim to describe the existing methodology, with the ensuing chapters aiming to identify the gaps and improvements that can be made.

The GD context appears theoretically ideal for examining optimistic planning biases. It does not appear to be subject to some of the influential factors that can exacerbate the planning fallacy, providing a reasonably refined environment where clear debiasing implications may be able to be derived. Since KONE Way internal development projects are considered to be "open" and sufficiently long in duration (i.e. spanning several months/years), theory would posit the impact of prediction optimism on

completion time (i.e. due to an effect on behaviour) to be negligible (Buehler et al., 2010a; 2010b). However, as will be described in detail in later sections, this is complicated by the potential elasticity between planning optimism and speed in task completion. This means that management often consider schedule manipulation to be a means of speeding up a project; a mindset that provides an opportunity to test the findings of Buehler et al., (2010b) in the empirical world.

As briefly discussed in the Research Method chapter, The KONE Way project-scheduling methodology is split into ten different milestones. A project is initiated with the preliminary ideas being captured, researched, approved and prepared (Milestones 1-5). The new solution is then designed and developed (Milestones 6-7), piloted in a single country (Milestone 8), and then rolled out globally into all pertinent units (Milestone 9). The final milestone (Milestone 10) is the closing of the project, which occurs after the completion of all rollouts.

Two of these milestones were identified in the preliminary analysis to be especially susceptible to the planning fallacy: the rollout phase (Milestone 9) and the development phase (Milestone 7). This is due to the greater degree of complexity involved in planning, owing to the longer phase durations and the higher number of separate entities involved in both the planning and completion activities. These separate entities include individuals from different parts of the organisation as well as external contractors. Moreover, since the underlying elements of these phases are conceptually similar, distributional information should be beneficial for present prediction accuracy. This means that the planning fallacy should be evident when present optimism conflicts with historical information.

The rollout phase appeared to be the primary area of systematic underestimation that arose during the preliminary analysis. The rollout phase overall encompasses all individual rollouts, and while there are differences in the complexity and duration of different rollouts, experience can still be derived and applied over the course of the rollout phase. In this research, optimistic bias in temporal prediction will predominantly be examined at the level of the individual rollout; i.e. the time it takes for the new solution to be integrated and adopted by a single local unit. This enables the

investigation of the planning fallacy at the micro level, which in turn relates to the scheduling of the rollout process overall. Improved accuracy in predicting the duration of a single rollout should facilitate the smoother implementation of subsequent rollouts due to a lower level of disruption. Overall, this project phase provides a rich example where rollout biases can occur, and hence many of the examples used in this research will involve the rollout phase.

In addition, some of the results will concern the development phase. The use of external contractors is most typical in this phase to assist in the development of all or a component of a new IT solution. Thus, the results regarding this project phase will be predominantly focused on the potential for optimistically biased predictions from third parties to detract from temporal planning accuracy in the project overall. The following chapter will cover the primary variables that planners need to take into consideration when predicting the durations of KONE Way project subcomponents.

## 4.2. The Key Variables Influencing Predicted and Actual Durations in KONE Way Project Planning

The objective of this chapter is to provide a description how project managers generate KONE Way schedules, and the key variables that can influence the duration of KONE Way projects. An understanding of these and the linkages between them is considered essential for identifying potential optimistic biases in the case environment. This section focuses specifically on complexities and considerations that arise at the project management level, with the social context and influence of different levels of organisational hierarchy being discussed in Section 4.3.

It will first discuss the importance of project content knowledge and prior experience in organisational project planning. It will then describe the extent to which distributional information is shared and applied for project planning within the case organisation. Subsequently, it will look more specifically at the variables that generally need to be considered when scheduling internal development projects. These variables include the external parties involved, the specific culture, country (local unit) and individuals involved in the project. As will be demonstrated, an increase in project content knowledge and relevant experience can help attenuate the negative impact of these

variables can have on planning accuracy. Next, it will outline the accumulation of experience over the course of the rollout phase. Finally, the potential underestimation of training durations within project schedules is described.

### 4.2.1. Project Content Knowledge and Environmental Experience

Interviewees revealed that they predominantly rely upon their content knowledge, as well as their own prior experience when predicting project durations. The two are inherently linked, since the accumulation of experience inevitably results in deeper content knowledge. "*Project-specific*", or "*content*" knowledge in this context refers to an individual's understanding of the project subcomponents; i.e. their technical knowledge of the solutions being implemented. In this discussion, project-specific knowledge will be kept at its' conceptual level and examined holistically rather than discussed in detail to promote the generalisability of findings. In contrast, *environmental experience* entails accumulated experience with more variable and contextual aspects of the project environment, such as the country, culture, company, or individuals involved. Thus, while content knowledge is limited to the specific technical work tasks involved in a project, experience can be accumulated through prior encounters with various other aspects of the project environment.

One interviewee succinctly described the process by which they formulate a project schedule using experience and content knowledge as the fundamental basis:

*"Mainly I go from experience, factoring in my knowledge of the developers, what they are developing, and how experienced they are. I break it into a work breakdown structure, starting with the high level tasks and go into a deeper level of all the activities." (Interviewee II, 2011)*

Conceptually, greater project content knowledge and environmental experience should help with the enhancement of Kahneman and Lovallo's (1993) inside and outside perspectives by allowing the planner to comprehensively deconstruct their project whilst providing a wealth of distributional information for them base their predictions upon. In this way, the more complete inside and outside perspectives should result in the reduction of optimistic planning biases.

One project manager summarised the importance of specific content knowledge as follows:

*"To effectively manage a project you have to know what is inside." (Interviewee III, 2011)*

An important point is that the extent of (project-specific) content knowledge naturally dissipates at higher hierarchical levels in the organisation. The people working in the project have the greatest content knowledge because they are actually completing the work. The project manager may have a varied degree of project content knowledge, depending on his or her specific background. Upper management – i.e. those stakeholders above the project manager – typically have much less content knowledge, since they are more concerned with how the project fits into the bigger picture. Consequently, upper management understand the project at a more abstract level, focusing primarily on the organisational benefits it will bring.

Thus, the level of content knowledge corresponds to the level of abstraction at which the project is conceptualised. This is consistent with the findings of Weick and Guinote (2010). Upper management have a far broader organisational perspective and comparatively low content knowledge. Their primary objectives and responsibilities lie in the realisation of project benefits at the global level. Hence they conceive the project at a high level of construal, whereby the project benefits are increasingly measured in the cost and efficiency gains that can be derived at a broader level. In comparison, those involved heavily in project work see the reality and face everyday challenges and obstacles to project completion, and have a far more detailed level of conceptualisation.

When the project manager's own content knowledge is considered insufficient for planning the project in detail, they need to rely more on the temporal predictions of others working on the project that do understand all of the project subcomponents. Consequently, in such cases the project manager has to manage the project at a more abstract level, highlighting the inextricable link between the content knowledge and the level of conceptualisation:

*"In the last project I found it very good that I understood everything about the systems, so I was able to control everything. But in the following role, I didn't really understand the specifics of the system, so I felt a bit uncomfortable not understanding everything that was going on and just need to trust that everyone else knew what was going on and what they needed to do. So I was managing the project from a bit higher level. A different set of skills is needed to make sure everything goes as planned from a higher-level point of view compared to a deep down detailed view." (Interviewee II, 2011)*

Lower content knowledge therefore presents additional uncertainty, since the project manager is then reliant to an extent on the potentially optimistic predictions of others. This will be described in detail later, after the differences between individuals working in the project are discussed.

Content knowledge appeared to be the most implicit and widely recognised form of distributional information relied upon in project planning. Subsequent sections will consequently focus more on the less visible forms of distributional information that go beyond the project content itself; i.e. more dependent on context and subject to environmental complexities. These are also accumulated through experience, and thus within this context the terms "historical information", "distributional information" and "experience" can be used interchangeably.

Implicitly, the more experienced the project manager, the more distributional information they have to draw upon. Moreover, historical information can also be shared to supplement a project manager's relative inexperience in a certain area. As depicted above, a thorough project-specific knowledge is innately important for effective and accurate temporal prediction, and is universally recognised as such in planning. However, this research found that the more peripheral and environmental forms of distributional information appear to be more likely to be overlooked in prediction. The following section describes how historical information is actually applied and shared in practice to generate time predictions for KONE Way project schedules.

### 4.2.2. The Sharing and Application of Distributional Information in Temporal Planning

This section will describe how different types of historical information are considered in KONE Way project planning. The interviews revealed that while individuals universally emphasised the importance of their own personal experience as a consideration in prediction generation, the experiences of others were drawn upon significantly less. Several reasons were identified this, and these will be discussed over the course of this section. Moreover, the quantitative analysis suggested that individuals might not necessarily base their predictions as closely on the past as they reported (see Appendix B).

As outlined earlier, the application of personal experience is widely considered imperative to the promotion of temporal planning accuracy. Conceptually, personal experience is a form of Kahneman and Tversky's (1979, as cited by Buehler et al., 1994) distributional information. Project managers consistently reported their own experience as the key basis upon which temporal predictions were made. Furthermore, where personal experience is lacking, it can be substituted by the experience of others. As one project manager put it, when approaching a project task, the primary thought process unfolds as follows:

*"Have you done this before? If you've done it before, what did you do? Is it appropriate? Do it again, and if you need to change it then change it. If you haven't done it before, find someone else who has done it before. Don't start from scratch if you don't have to." (Interviewee IV, 2011)*

However, as referred to in the beginning of this Results chapter, the comparative analysis of completed, ongoing and future durations suggests that historical information is not adhered to as closely as it could be (Appendix B). This suggests the prevalence of a mindset where the future is perceived as innately more positive than the past, which conflicts somewhat with the general assertion of project managers that past experience is one of the cornerstone considerations in prediction generation.

Moreover, in practice, while project managers routinely proclaimed the importance of their own personal experience for planning accuracy, they consistently acknowledged

that they did not typically draw upon the experiences of others as frequently. As one project manager reported:

*"I don't really know the way the other project managers work. I work in my own way, and don't really have a rapport with the other project managers and don't know their ways of working." (Interviewee V, 2011)*

The interviews indicated several possible reasons for this low level of integration of others' experiences in project planning. First, the extent of similarities between different projects may be unclear. Secondly, attributional biases can allay an individual's inclination to rely on the experiences of others and make them more likely to consider them irrelevant. Third, there are time constraints to sharing knowledge and experiences. Fourth, project managers looking for a certain type of advice/experience may find it difficult to find a suitable person to talk to. Finally, there is some inclination to 'protect' one's knowledge to maintain their position as an expert relative to others in the organisation.

Firstly, the perceived superficial differences between projects limited the reference class of similar projects from which distributional information can be considered. This is exacerbated by information asymmetries between project managers regarding project details. This inherent mindset, which induces a focus on the surface differences between projects rather than their underlying similarities, is illustrated by a recollection from one experienced project manager:

*"There was nothing to compare it with, because prior to this project, the product did not exist. But then I thought: "what does it matter what product it is? When integrating anything to SAP you have to achieve certain things on this side and on the SAP side, and whatever code it is, it is still the same. And so it has proven to be." (Interviewee VI, 2011)*

Her initial focus was on the differences and the uniqueness of the new integration, however looking beyond this revealed the core similarities between this and prior projects.

Furthermore, there could be a propensity for project managers to overlook or discount as irrelevant the experiences of their colleagues. This was highlighted by one interviewee who suggested that even upon receiving advice base on similar experiences, project managers still may not apply it in their own planning:

*"They don't tap into it (the experiences of others); or they'll read it (information of previous experiences) and then still decide to do their own thing." (Interviewee IV, 2011)*

Third, busy schedules mean that project managers have limited time for knowledge sharing, and project work often takes precedence:

*"I actually spoke with one colleague who has had experience in this area before. We should have spoken more, but time is always of the essence". (Interviewee VI, 2011)*

*"I would like to spend a bit more time with some of my colleagues who are doing the same thing because we can learn a lot from each other. But we don't really have that time, and that's a pity." (Interviewee VII, 2011)*

Fourth, even of the project managers recognise the importance of historical information in planning and attempt to make time for it, they may not always know who to ask for advice in different areas.

*"It would be good if there were some visibility about who has experience in different areas; people we could use as a reference. Sometimes I think we reinvent the wheel each time." (Interviewee V, 2011)*

Currently, people are heavily reliant on their own personal networks in identifying others with relevant experience.

*"How can we share knowledge and experience in these types of projects? Right now it's about whom you know; do you know someone who has worked in the same type of project before? What were some of the challenges? You can ask around, so your own personal network comes into it." (Interviewee IV, 2011)*

Additionally, a further hindrance to the integration of experience in temporal prediction is the potential reluctance to share knowledge within the organisation. One project manager suggested that some individuals might want to remain as an expert in a certain area, and are hence reluctant to transfer knowledge to others for fear of losing this position. The interviewee explained this inclination with a comparison between knowledge sharing in internal projects and knowledge sharing in a consulting firm:

*"I find there is a big difference between working in consulting and working in a company doing internal project management with an internal team. In a consulting environment people do a project, they document everything and then give it to somebody else because they want to move on and go to another project, whereas in a company you have a lot of people who want to protect their knowledge and not share or document it in a way that can be shared, or simply not share the information. So they can keep their own area of comfort." (Interviewee VII, 2011)*

In sum, there are various barriers to the sharing and consideration of others' experiences in temporal prediction generation. Project managers generally recognised that they would be better equipped to formulate accurate predictions if they had more distributional information to draw upon – distributional information that could be acquired through the sharing of experience.

But what types of experience is beneficial for temporal planning accuracy? Aside from the project-specific knowledge discussed earlier, several key variables were identified within the organisational planning environment that need to be carefully considered in time prediction. These include the cultural, national and individual differences that eventuate from operating in the multinational environment. The next section will broadly detail these different environmental variables that can impact project duration and hence need to be considered in prediction generation, and then describe what can happen when project managers become dependent on the time predictions of others.

### 4.2.3. The Multinational Environment: Cultural, Country, and Individual Differences

This chapter will outline some of the primary areas where contextual differences can arise in internal development projects. These considerations go beyond technical

content knowledge, comprising more the inherent variances of the MNC project-planning environment. For the purposes of this research, these will be categorised as *environmental variables*, based on Pitagorsky's definition of the project environment as: "*the surroundings within which the project will be performed, including the location(s) of participants, the working conditions, and culture*" (Pitagorsky, 2007, pp 64-65).

These variations are implicit to the multinational organisational environment, introducing additional complexity and with this additional scope for the planning fallacy to influence time predictions. Although these environmental factors inherently affect all project stages, the differences are considered most visible during the rollout phase. In this phase the solutions are implemented into each individual country, and so the specific characteristics of a rollout unit's culture, country and individuals involved are most influential to the schedule here. Hence, this stage will primarily be alluded to and exemplified throughout this section, since the consideration of these variables is arguably most pertinent during the rollout.

As with external suppliers, prior experience and historical information is particularly important with these environmental variables. Experience with different cultures, countries, and individuals enables the project manager to carefully consider how these factors pertain to their current project and adapt schedule accordingly.

*"It's cultural stuff... You have to know how the countries, the companies and the people are... It's based on people, mentalities, companies, and in the end you have to make your own judgement based on that." (Interviewee III, 2011)*

### 4.2.3.1. Cultural Differences
Cultural characteristics comprise the broadest and most encompassing environmental considerations for project managers. Experience with different cultures is fairly easily attainable and can deepen the project manager's level of understanding of the rollout environment, which can then be incorporated into planning. While excessive stereotyping should be avoided, generally acknowledging and accommodating for cultural differences in the schedule can help improve prediction accuracy.

For example, interviewees generally reported that Eastern cultures often require significantly more direction and specific guidance than their Western counterparts, which can often make project tasks involving these countries take longer.

*"We had consultants in India, and the way they work is totally different to in Europe. The speed is a lot different. They are not so independent; you can't just send them something and then in two weeks it comes back. You need to really instruct all the steps that they do, so it takes twice as long." (Interviewee II, 2011)*

### 4.2.3.2. Country-specific Differences and Unit Buy-In

Country-specific differences can also heavily influence planning considerations and decisions. These country-specific attributes significantly impact the complexity and level of resistance encountered in a rollout. At the general level, there are the broad, encompassing variances such as legislation that affect all companies within that country. Beyond this, there are the more intangible and specific characteristics, attitudes and legacies of the individual local units themselves.

Solution rollout necessitates the heavy involvement and cooperation of the specific unit. All rollouts are inherently challenged by the essentially divergent primary objectives of the local unit and the Global Development team. The GD project team's primary objective in this phase is the timely integration and adoption of the new system, since this is the objective of their project in general. In contrast, the adopting front-line unit's primary focus remains elevator and escalator sales and maintenance activities. Moreover, the specific degree of complexity and resistance encountered in a particular country can vary considerably. Rollouts are typically more challenging to implement and encounter greater local resistance when the local unit is larger and has more comprehensive existing (legacy) systems that are being replaced by the new solution; since this necessitates more extensive changes in work processes. As one project manager explains, it is this complexity and resistance that can prolong the planning and implementation period:

*"If the business would accept 100% the global package then these projects would be simple… But they're never simple, because every country is different. Every country has*

*different local processes that require every rollout to be completely different."*
*(Interviewee VIII, 2011)*

At the other end of the continuum from unit resistance is unit buy-in. In this context, the level of 'buy-in' is defined as the enthusiasm for acceptance of the new tool/system. Thus, where resistance from local units can complicate and prolong the rollout, unit buy-in simplifies the rollout process and can hence reduce both the anticipated and actual completion times.

Aside from the factors discussed that can naturally abate the level of resistance, buy-in was revealed to be significantly dependent on the attitudes of the local unit employees. Higher unit buy-in means less change aversion and resistance, and greater unit cooperation. GD project managers revealed that greater unit buy-in resulted in a higher likelihood of getting suitable and competent local resources assigned to the project, and in sufficient amounts. Because local units have other primary objectives and responsibilities, the integration of new IT tools and systems is considered a peripheral activity. Consequently, other work tasks are often prioritized over activities facilitating the integration process. The risk of this is lowered by increased buy-in, with local resources more likely to be devoted to the project.

*"It depends on the country a lot, and how you sell your project. If they don't want it, they really don't want it, and they will do everything they can to postpone and not do it, but if they want it they will do it fast." (Interviewee III, 2011)*

Thus, a key challenge for the project manager in rollout scheduling is to effectively assess the level of buy-in from a local unit whilst planning for measures to help overcome this, and then incorporate this into predictions.

### 4.2.3.3. Individual Differences

Finally, there exist substantial differences at the individual level. Different individuals have different backgrounds, competences, learn at different rates, and have a different level of aversion to change. Hence, the characteristics and competences of the specific individuals involved in a project is an important consideration for the schedule.

*"Not all resources are the same. Depending on which people you get to work with in a project, it definitely impacts your timeline. When you're given somebody who has a lot of experience, you have a lot of confidence in them, and they have worked on similar projects in the past, they can do things much better and with much less supervision than if you're given a new hire or an unmotivated individual that you have to be much more hands-on with. That impacts the timeline and how fast you can get work done."* (Interviewee VIII, 2011)

This implies that scheduling inaccuracies could arise if individuals working on the project are treated as the same. Accordingly, project managers highlighted the importance of building experience with different individuals for temporal planning accuracy:

*"Especially with more complicated projects, if possible I would try to find out more about the local project manager: if someone has worked with them before, is there something I that need to understand, do they want to work independently or do they want to have really hands-on support? So my project won't be postponed because I didn't understand what they actually needed."* (Interviewee II, 2011)

Project managers should therefore take into account the specific work patterns and requirements of the individuals in their project. The following section will show how project management experience can be accumulated and applied to future predictions for the benefit of scheduling accuracy, using the project rollout phase as an example.

### 4.2.4. The Accumulation of Experience in Rollouts

The project rollout phase is the project phase that is perhaps the most vulnerable to uncertainties and complexities presented by the international environment. Since this phase overall is comprised of many individual rollouts, there is an opportunity to learn from earlier experiences and enhance the rollout process in local units that are rolled out thereafter. Consequently, despite the significant contextual differences discussed, the actual planning practices from earlier rollouts should be beneficial in guiding the plans for subsequent rollouts.

*"I've been involved in six rollouts so far for this project, and each time you learn more and say: "ok I'm not going to make that mistake next time. I'm going to make sure that I plan that accordingly next time and we're not going to be getting delayed because of that". So you try to learn from every one of the projects." (Interviewee VIII, 2011)*

*"The more rollouts you do, the more experience you'll get. So rollout 10 will be shorter than rollout 2, but rollout 2 will be just as long as rollout 1." (Interviewee IV, 2011)*

This suggests that the project manager's capacity to plan accurately should increase with additional rollouts, since there is more historical information to draw upon in schedule generation. Additionally, project-specific/content knowledge should increase in parallel with additional environmental experience. This means that later rollouts may be more easily and faster implemented due to learning from previous cases, but they could also be more accurately scheduled due the availability of historical information and sufficient content knowledge.

This can seemingly provide some rationale for the results of the comparative analysis; i.e. that future rollouts should justifiably be expected to be shorter than past and ongoing rollouts (see Appendix B). However, while this may explain some of the deviation, such consistent and substantial differences in past vs. predicted times is considered to indicate some tendency toward an overly optimistic future outlook.

Furthermore, while such progressive improvements in planning accuracy are intuitive, they may not always be realised in practice. As the following section will discuss, additional experience builds increased familiarity with the processes and solutions, which can lead to those working in the project becoming further distanced from new users.

### 4.2.5. Training

A core component of the implementation process in a rollout is the training of key users in the local unit. These key users then train the necessary local unit employees (the end users) to use the new solution in their everyday work activities. Hence, time and resources must be allocated for training in the rollout schedule. Several project managers highlighted a tendency for solution experts to under appreciate the difficulties

that new users face, thereby oversimplifying the training process. Since the technical operators who train others work on the tools and systems daily, the use of these becomes second nature and they hence tend not to consider the difficulties or initial confusions someone might experience when viewing them for the first time. As one interviewee articulated:

*"People get blind when they do their projects. They are very very familiar with every single step in the tool or system or process or whatever they develop, and they don't remember anymore what it feels like to get this new thing in front of you for the first time and say "implement this"." (Interviewee II, 2011)*

Thus, this inclination to oversimplify the training process can lead to underestimation of the time it takes to train the average novice user.

*"Our team members and the IT guys are a bit blind, they think that if you explain everything once, like: "here is the solution, you click here and here, and here and here and here, thank you, bye, call me if you have questions." And then they wonder six months later on: "Why do they still make mistakes? Why isn't everything perfect?" They've lost the point that it's their daily work, and the other people are doing it maybe once a week or once a year." (Interviewee II, 2011)*

The following part of this Results chapter will broaden the scope of empirical findings beyond the project management level to describe the various aspects of the portfolio and greater-organisational environment that could influence the propensity for optimism in scheduling.

## 4.3. Considerations at the Portfolio Level: The Social and Power Dynamic in Scheduling

This section goes beyond the project level to focus upon the collaborative environment and the influence of power on temporal estimations. It will discuss the potential for optimistic prediction biases to permeate the schedule due to the intervention and interaction between different levels of organisational hierarchy. '*Intervention*' in this context is defined as any influence exerted on the schedule that comes from a level above the project manager. Typically manifesting as either an enforced reduction of a

project schedule or the imposition of ambitious deadlines by upper management, schedule intervention invariably results in a shorter project schedule that would otherwise exist. This section will first show how temporal predictions tend to be inherently more optimistic at higher levels of organisational hierarchy. It will then clarify circumstances in which management can justifiably influence a project schedule. Next, it will discuss the different extent to which upper management can influence a schedule, before focusing primarily on instances where high-level deadlines are imposed from above. This will entail an overview of the rollout-planning phase, since this was described in detail in the interviews and appears one of the more common instances of extensive upper management intervention in scheduling. The primary focus here is the social and collaborative context in which these rollout schedules are generated and agreed upon. It will subsequently describe how temporal proximity and the level of construal can influence the planning agility at different levels. Subsequently, it will describe the potential for dependences on the temporal predictions of others to arise, followed by the implications of this for the supplier contract approval process. This will lead onto a description of the contract approval process to demonstrate how this dependence on others' predictions can introduce additional complexity when coupled with information asymmetries. Finally, it will describe the effect that intervention in the absence of sufficient justification can have on job satisfaction and employee morale.

'*Upper management*' in this context is used as a blanket term to define any stakeholder who is not directly involved in the actual project work (i.e. the solution implementation, training, and support) but has more decision making power than the project manager. Thus, in most cases upper management consists of management representatives from Global Development and the relevant Business unit, as well as the geographical business divisions who are not directly involved with the project work itself but are stakeholders in the harmonisation of global work processes and IT solutions.

The emphasis on speed and pressure on project managers from above is omnipresent in the organisational context, owing to the implicit desire for immediate benefits realisation. However the extent of tangible influence that upper management exerts on the schedule varies between projects. At one end of the continuum, there is the schedule

developed by the project manager themselves based on their own temporal predictions. At the other, there is the 'inherited' schedule, whereby the project manager receives the high-level deadlines from above. In this case it is then up to the project manager to schedule the project components within the espoused dates. In between these, the schedule is typically developed by the project manager and presented to upper management, who typically apply pressure for it to be shortened.

One project manager gave the following detailed example of management influence on the schedule she had formulated:

*"We made a good plan with the team, with the experts in the process area and from the technical side, but as it always happens, the management, when we announced our schedule: when we would have the development ready, when we could start the first front line, and then when we could go live with the front line. We gave them a certain time schedule, and the management took seven weeks off that schedule. They said: "you can make it faster". But we couldn't." (Interviewee VI, 2011)*

When asked what rationale her management gave for reducing the schedule, she replied:

*""Fast! Out to the unit. Benefits! Make it faster so we can faster implement it in the units." But unfortunately there are certain limits to what you can achieve." (Interviewee VI, 2011)*

By definition, reducing a schedule with a clearly established critical path requires the reduction of some element of the critical path (PMI, 2008). Conceptually, a reduction in duration involves some compromise in at least one of the other two *triple constraint components*; i.e. cost or scope (Pitagorsky, 2007). In practice this could mean increasing the amount of resources (project workers), increasing the project budget, or compromising on quality (reducing scope) to speed up a project task. Interviewees reported that the prioritisation of the three constraints varied between projects, and it was important to understand where the priorities lay for their particular situation.

In addition, these constraints were revealed to be imperfectly interchangeable in practice. For example, the capacity to speed up the implementation without compromising on the quality of the output can be limited by diminishing returns to

labour and capital inputs in internal development projects. One project manager described such limitations to the reduction of the critical path using the following analogy:

*"If you need to dig a hole, and the hole is one metre by one metre and one metre deep. If you put one person there to dig it takes a long time. If you put two, it's shorter, but if you put a hundred people there, nothing gets done. This is something that relates to our project too, we may not have had any more people that we could have put there, but with project and they way we progressed there were not really any things that we could have done in parallel, so we had to finish one phase, and only then could we begin the next phase. So nothing could be done so the schedule could be shortened." (Interviewee VI, 2011)*

Thus, this practice of upper management intervention is seemingly paradoxical, since higher hierarchical levels have a greater tendency to exhibit optimistic biases though a lower capacity to sufficiently justify them. This paradox will be further elaborated in the following sections, which will discuss in detail why schedules that are actively imposed onto lower levels have a high likelihood of being optimistically biased. This will focus upon the attributes and motivations of the individuals generating the predictions and the social environment in which schedule formulation can occur. First, however, a caveat regarding the justifiability of upper management intervention is necessary to clarify the underlying assumptions of the ensuing analysis.

### 4.3.1. Addressing a Stipulation: The Rationale for Management Intervention

The case described in the preceding section involved upper management intervention in scheduling without sufficient justification for why the reduced schedule could be realistically attainable. An important stipulation that should be addressed at this point is that there can be a credible rationale for upper management intervention. If an imposed reduction in predicted completion time could induce a reduction in the actual completion time, then management intervention will not necessarily exacerbate temporal underestimation and can actually be beneficial for the project. The interviews revealed that such a reduction in actual completion time could be achieved by a

reduction in the time spent on non-core work tasks, such as discussion, deliberation, and decision-making.

Strictly speaking, if the project subcomponents are clearly established and agreed upon, then the execution is straightforward; there is a critical path that is only as fast as the extent to which different activities can be done in parallel. This is where upper management intervention to reduce the schedule in the absence of sufficient justification is most detrimental to the schedule. However, if the project scope and subcomponents are not clearly defined, ongoing contention and deliberation can prolong decision–making and hinder the project progress. In this case, speeding up decision-making can actually reduce the critical path. As one manager suggests, in these cases if more time is allowed for such decision-making, more time will be taken:

*"Try to see what we don't need, try to see what we can do in another way, but don't systematically push (the deadlines). Because if you systematically push there will always be a delay. If you give people more time, they will take more time." (Interviewee I, 2011)*

Thus, in some cases there is a rationale for upper management intervention if it can induce an improvement in task completion behaviour. This is a principal caveat, with important implications for the circumstances in which upper management influence temporal planning. It means that upper management intervention in temporal planning is not universally detrimental to prediction accuracy.

This notion that schedule reductions can result in a reduction in the actual completion time by inducing a positive change in task completion behaviour broadly comprises the rationale for upper management intervention in planning, and introduces incompatibilities with planning fallacy theory that will be evaluated in detail in the Discussion chapter. However, as the following section will illustrate, the project manager should naturally be in a better position to make more accurate (less biased) temporal predictions for their own project compared to their management. This will describe a common perception within the division: that inherited schedules inevitably tend to be optimistically biased due to the relative position and motivations of those setting them.

### 4.3.2. Extensive Management Intervention: The Inherited Schedule

This chapter will describe the case where high-level deadlines are imposed upon the project manager to exemplify how a difference in hierarchical level can influence the extent of temporal underestimation. In the interviews, schedule intervention was found to common practice in project rollouts, where upper management plan at the high-level the dates a solution will be introduced and commence use in the production environment in a given country. Because the rollout phase is perhaps the most conceptually homogeneous component of KONE Way projects and an area in which upper management often intervene in temporal planning, it is considered suitable for examining the impact this intervention can have on planning accuracy. This section also aims of this is to give an overview of the social context within which rollout schedules are generated to enable the potential for the planning fallacy to arise from social, motivational, temporal proximity and power-based factors to be scrutinised in the Discussion chapter.

A common belief among the project managers interviewed was that individuals and groups that conceptualise the project at a higher level than they themselves do almost universally underestimate how long it should take to complete. As one interviewee expressed:

*"Everyone always thinks a project takes shorter than it does. So there are always unrealistic expectations… The expectations are always going to be wrong."* *(Interviewee IV, 2011)*

Consequently, when upper management exert excessive influence on a schedule it often exacerbates the optimistic temporal bias.

The rollout phase is where – after they have been developed and tested – global solutions are implemented into local units worldwide so that the benefits of global harmonization can be realized. At a high-level, the planning deadlines that are most important are the rollout start date and the go-live date. Before the actual start date there is a kick-off meeting, where management from the relevant parties involved (i.e. the global business division, GD, and local and area management employees) come together and discuss the rollout at a high level of abstraction. In a typical rollout, the go-

live date is defined as the date the new tool or system is commences its use in the production environment. Thereafter, the rollout work moves to support activities for the live tool/system.

There is no established best practice for the generation and agreement of rollout schedules. One of the key variables in the generation of a rollout schedule is the degree of influence upper management has on the schedule. At the greatest level of upper management intervention in the rollout schedule, the start and go-live dates are effectively imposed from above. It is then up to the project manager to schedule the rollout subcomponents within these two dates, as these two quotes from project managers illustrate:

*"The timelines for these projects are basically handed to me, and I just have to do whatever is possible with whatever resources I'm given, to make sure we meet the deadlines that are basically told to us." (Interviewee X, 2011)*

*"When I do my work breakdown structure, I'm given my timelines by my management saying "ok we want Country A started on this date, ending on this date, I basically take the timeframe I'm given and I build a work package that fits within that timeframe, knowing in all honesty that it's never going to be accurate." (Interviewee VIII, 2011)*

This extreme case – when high-level rollout deadlines are imposed upon project managers – can clearly illustrate the possible implications of extensive intervention by upper management for planning accuracy.

As previously discussed, both project content knowledge and prior experience within the organisational context was regarded to be the most beneficial inputs for accuracy in schedule formulation. Consequently, project manager predictions should be inherently more accurate than those inherited from above ceteris paribus in accordance with their greater content knowledge. This sentiment overwhelmingly prevailed in the interviews with project mangers, with overly ambitious inherited schedules seemingly being the norm. The link between limited content knowledge and excessive optimism in rollout schedules set by upper management is exemplified by the following comments from interviewees:

*"It's from the top, being pushed down to the bottom, in terms of: 'We expect Country A to go live on this date', and we do everything we can to get Country A live on that date, but, to be honest, it never happens. And the reason it never happens is that the people making these decisions – the upper levels of management – have zero idea of the work that's required to actually do the implementation." (Interviewee X, 2011)*

This shows that not only do individuals at higher levels of organisational hierarchy have relatively lower levels of project content knowledge and environmental experience, they typically construe the project at a higher level of abstraction; focusing more on the holistic picture rather than breaking it into tangible subcomponents.

*"Upper levels of management will always say 'we want something done in two weeks', but what they don't realize is that there is actually six months of work that are required to actually get it done." (Interviewee VIII, 2011)*

*"A lot of that has to do with the fact that the original timelines are made by people who don't actually understand the details of the work involved in the project." (Interviewee VIII, 2011)*

In addition to the limitations to content knowledge and relevant environmental experience in upper management predictions are the relative motivations for speed in completion and the attributes of the environment in which the predictions are generated. This is discussed in the next section, which describes the social context in which high-level rollout deadlines are typically established and agreed upon.

### 4.3.3. The Generation of High-Level Deadlines: The Kick-off Meeting

This section describes the social environment in which high level planning takes place. This will illustrate the process by which group discussion and heightened positivity can both justify and exacerbate individuals' predispositions toward optimism in prediction, allowing the influence of social context on optimistic bias to be analysed in detail in the Discussion chapter.

Often the case is that the rollout start date and go-live date are set and agreed upon at the high-level at the kick-off meeting. Project kick-off meetings typically involve top-

management from the relevant business functions and areas. One project manager described his perception of what occurred at a typical kick-off meeting:

*"A lot of the times we have a kick-off meeting, where the business managers, some GD representatives, up until recently not myself, but more senior people than myself, they go on site and present the application, they talk about all the great things the application does, and they explain that:*

*"Ok, we're going to implement this project, are you guys happy with this?"*

*"Yes, it's great! We love it! Perfect!"*

*"Anything it doesn't do?"*

*"No it's perfect, we'll take it as it is"*

*Then a month later when you are ready to actually start implementing:*

*"Oh, but it doesn't do this, but it doesn't do this, but it doesn't do this, and we need to do that…""* (Interviewee VIII, 2011)

Some interviewees specifically emphasised the abundance of positivity and optimism at the kick-off meetings. As outlined earlier, the complexity of a rollout is also moderated by the extent of unit resistance – something that is often masked in the initial stages and at the kick-off meeting. As one described:

*"I think when we have the kick-off meeting everybody is a bit motivated. The upper levels of management come to these kick-off meetings, and at this point everyone is talking at a very high level. At that point, nobody wants to say anything 'bad' or "are you sure that this timeline is attainable?" At the time we have the kick-off, we don't really have the business project team in place, we don't really have a GD project team in place, we don't know how many different development needs we're going to have or whether we have the resources to do those developments." (Interviewee VIII, 2011)*

Moreover, project managers generally suggested that clarification of the rollout scope was instrumental to temporal planning accuracy. The scope of a rollout is dependent on

the number of local customisations that need to be made to address the gaps between the local systems and processes and the global solution. As one project manager articulated:

*"So the biggest problem in a project is in understanding the deviations, the gaps, the development needs." (Interviewee X, 2011)*

*"The hardest part of all the projects that I've been involved in is in actually understanding the local processes and how these impact the implementation of the global tools." (Interviewee VIII, 2011)*

A common problem was that the 'gap analysis' – i.e. the identification of the specific developments that need to be made to be able to implement the new solution into a local unit's existing environment – was typically conducted after the kick-off meeting, once the local unit had been able to properly test the tool in detail within the local context.

*"I think what is happening is that we're providing the project end dates too early, because we don't actually understand the full project scope before setting the project end dates. (Interviewee VII, 2011)*

*All of these things start to pop up during the initial phase when the business starts to touch it, and that's part of the problem. The timelines are set before the business has had the chance to touch it and learn how it actually works, so from a high level, when you say, "we're going to implement this, and it's going to do that" (Interviewee VIII, 2011)*

An important stipulation here is that there are good reasons for freezing and communicating clear rollout deadlines as early as possible. As a program manager suggests, establishing deadlines as early as possible can help ensure that no time is wasted in the project's early stages. Moreover, setting a definitive rollout go-live date at the beginning of the project is perceived as important to help solicit the buy-in and commitment of the local unit; something widely acknowledged to simplify the integration process.

*"If you are in a rollout mode, not giving a go-live date at the beginning of the project is leaving things too open for people to delay their activity. I think the go-live date gives people a milestone, which is important." (Interviewee I, 2011)*

However, pursuing these benefits by establishing a definitive go-live at the start of the project could compromise temporal planning accuracy due if the scope is not known in detail at that point. Unless a thorough gap analysis could be conducted prior to the kick-off meeting, it was widely perceived in the interviews that there was insufficient information regarding the specific project scope and the level of unit resistance to facilitate the generation of an accurate schedule. Furthermore, in the absence of a clear and detailed rollout scope, the propensity for excessive optimism to permeate the planning in the form of a best-case scenario appeared to increase:

*"So there's so many things that are unknown, that at the end of the kick-off meeting when you say "ok, here's the timeline we're going to put in place", that is the timeline you can do if all of the things fall into perfect place. It's the best-case scenario that we provide at that time." (Interviewee VIII, 2011)*

### 4.3.4. Accommodating for Project Delays

This section aims to describe how decisions are made regarding the inclusion of time buffers under uncertainty, and the influence that upper management motivations can have on schedule agility when project completion barriers arise.

The interviews revealed that there is no universal practice for building a time buffer into the schedule to account for the possible realisation of obstacles to completion. The project managers interviewed were divided on this issue. Some were adamant that additional time should be included in the schedule due to uncertainty and the possibility of delays. Furthermore, the amount of buffer included should positively correspond with the level of perceived uncertainty. One project manager described this process as follows:

*"You're always trying to cover the fact that there may be a delay due to some unforeseen contingencies, quality issues and scope changes... In a more controlled state*

*you tend not to buffer so much, you tend not to allow for more risk and you can trust past experience more." (Interviewee IV, 2011)*

In contrast, some project managers reported that they were explicitly instructed not to include additional time in the schedule for possible delays. One project manager expressed some discontent with the way in which this conflicts with the commonly espoused project management practices communicated to them in PMP certification training (see, for example PMI, 2011):

*"I've taken project management courses, and they always tell you that you have to add in some cushion because there are always unforeseen things that will arise... So we go on these trainings, but then we go to implement the practices we learn, they say: "no, no, no, skip that. Do it our way"... So the way I work is actually far from what I read about in the (project management) certification material." (Interviewee VIII, 2011)*

There is no official practice for the inclusion of a time buffer in KONE Way projects. This means that management intervention on scheduling can be discretionary. The implications of such intervention from higher hierarchical levels with regards to the consideration of potential obstacles to completion will now be discussed.

The emphasis on a 'tight' and inflexible schedule means that it becomes more difficult for project managers to justify the possibility of a delay being factored into their schedule in the form of a time buffer. Thus, proposing the extension of a project's duration in these cases requires more concrete and specific justification:

*"There's so much pressure from the upper management to get these global tools into these countries that they don't want to hear about it (potential obstacles to completion that could cause delays) really... In the end they don't want to hear the 'might bes', you have to give them specific reasons for a delay." (Interviewee VIII, 2011)*

*"I bring things up, but the people are pushing for these projects to happen so fast they don't want to hear about it until the last minute." (Interviewee X, 2011)*

In this way, the emphasis on speed in completion appears to perpetuate the likelihood of best-case scenario formulation, since potential obstacles to completion are often

overlooked due to their low perceived likelihood. The result is a schedule that can only be realised if everything falls perfectly into place and no possible obstacles to completion manifest.

Hence, when presented with an unrealistic schedule or asked to reduce their initial estimation, project managers need to communicate what they think can be achieved and try to bring expectations more into line with the reality. The use of clear and specific evidence to show why the schedule is unachievable was most commonly regarded as the best way to counter-argue an unrealistic schedule. If upper management still want the ambitious deadlines to be achieved, they should be willing to accept either an increase in budget, a reduction in scope, or both. The project manager needs to be able to communicate effectively to be able justify their argument with comprehensible evidence rather than emotion, in terms that upper management will understand.

*"You have to bring peoples' expectation maturity levels up during a project, and you do this with evidence. The more evidence you build during a project, the more understanding there will be… Use evidence; don't use emotion." (Interviewee IV, 2011)*

However, some project managers reported that even when a clear reason for delay is available there seemed to be a reactive mentality to the potential obstacle. This means that management were reluctant to permit adjustments to the schedule until there was no doubt that the delay would actually be realized. Since the project manager conceives and plans the project at a low-level of construal, they can more readily identify the potential for delays. However, once these are communicated to upper management, rather than condone a modification to the schedule, the typical response is to "wait and see" if the delay will actually manifest.

*"Imagine you know nothing about how to build a car; you only know you want to drive in it six months from now. One month after the car has started being built, the guy says: "forget your car, it will never be ready in five months", Will you believe this guy when you know that a month ago he was saying: "yes, let's do it." You're going to say: "come on, let's give it time". So that's the problem: you have to convince your management that you will not succeed in that timeframe." (Interviewee III, 2011)*

Therefore, the willingness for upper management to accept a change in the schedule appears to negatively correspond with the temporal distance between the present and the time that the delay would be realised. This means that the initial inclusion of time buffers to account for possible delays is often actively discouraged, and project managers experience greater difficulty in convincing their management a delay could eventuate for a specific reason if that delay is further into the future.

This is not as straightforward as it appears, however. It is complicated by the possibility that accepting and communicating a revision to the project schedule could change the speed at which people work and make decisions. If upper management perceive this to be the case, they are likely to consider the possibility of a delay and incorporate it into a contingency plan, but not communicate it to the project team to ensure they continue to work efficiently.

*"If there might be one-month delay… and if you are working toward the first August, you're still communicating the first of August. "Don't work until the first of September". We'll see mid-June if we need to revisit the plan. We're not crazy, we don't want to jeopardise the project. But don't plan for September, because the longer you give the people, the more time they will take… The more time you give them, the more they will discuss and argue about the gaps." (Interviewee I, 2011)*

This reinforces the notion that the relationship between scheduling and task completion behaviour is often a grey area. This issue will be revisited and analysed in more detail in the Discussion chapter. The following section will describe instances where components of the project schedule become dependent on the predictions of individuals other than the project manager or upper management.

### 4.3.5. Planning Interdependencies: Identifying Optimistic Biases in Others

This section will discuss the challenges of relying on the potentially biased predictions of individuals other than the project manager. Project managers are often reliant on the time predictions of others for some project subcomponents. This occurs with both internal (KONE) employees and external third parties. For example, dependence on internal resources is often the case in the rollout phase if the project manager is lacking content knowledge. Such dependence can also occur with external suppliers contracted

to develop some component of the new solution or complete some other specific project subcomponent. This dependence on the predictions of external suppliers involves additional complexities, which will be discussed in the subsequent section (Section 4.3.6).

This section will first discuss how best to deal with project workers and external contractors to moderate their potential prediction biases. Many project managers acknowledged in the interviews that both internal and external temporal predictions are often excessively optimistic. As with making personal predictions, the interviewees emphasised increased project content knowledge and experience with the specific individual(s) making the prediction as the best ways to evaluate how much confidence they should have in the espoused schedule.

Increased project content knowledge can naturally reduce the dependence on the predictions of others. If the project manager knows generally how long a project subcomponent should take, the dependence on third party predictions is inherently reduced:

*"You start to learn that when those guys say "yeah, no problem, we can do it in two months", you know by experience that with IT stuff, two months, that doesn't exist, it's impossible." (Interviewee III, 2011)*

If the project manager does not have sufficient technical knowledge and has to rely on the prediction of the employee or subcontractor who will actually complete the work, then historical information about the individual making the prediction (e.g. from personal experience or from asking colleagues) along with an understanding of their position and motivations is beneficial for gauging how much confidence to have in their prediction. This often entails a more subjective evaluation of the individual(s)/organisation in question, however it was still routinely recognised as valuable for promoting accuracy in the overall project schedule. One project manager described how such experience with a specific individual (internal or external) might be accumulated:

*"If a guy says two months, and I don't know if it's true or not, probably two weeks later I will already contact him and say: "have you progressed?" I would ask him "what will you do the next two weeks?"*

*"I will talk to this guy, I will design the architecture, I will do this, this, this and this." Then I would write these down, and two weeks later I would call him and say "Have you done this?" I'm probably not going to ask everything in the list, but "have you done this?"*

*"Ah, no because the guy was not there, and this was not there, but next Friday, that's going to be done."*

*Then next Friday if he says, "no, that's not done", then I know the guy. I know what category he's falling into. Then I know to say: "ok, two months, forget it, it's going to be longer". Then I'll start to say: "how am I going to ensure that a delay in that task will not jeopardise the rest of the setup?"" (Interviewee III, 2011)*

The most commonly reported way to deal with the uncertainty surrounding predictions upon which the project manager is dependent is to arrange the scheduling of project subcomponents to facilitate agility in planning. Project managers aim to organise the critical path so that a delay in the third party's area of responsibility will not disrupt the progress of the project overall:

*"What you try to do at that moment is to try and make your own estimation of how long they will take to do it, and you will try to put everything in place in such a way that if they are late the rest of your project can continue." (Interviewee IX, 2011)*

This experience can then be considered in future instances where the project manager is reliant on a prediction from the same person. If the present predictions do come from a proven under-estimator, the project manager can react accordingly to minimise the impact of the potential underestimation.

Such a reliance on the predictions of others becomes more complicated in the contract-approval process, where there is a greater level of information asymmetry, and where

higher levels of organisational hierarchy are involved in decision-making. These complexities will be addressed in the following section.

### 4.3.6. Information Asymmetry and The Contract Approval Process

The dependence on external supplier predictions is further complicated by a greater degree of information asymmetry between the project manager and the third party, as well as the inherent incentives and consequent motivations of the contract approval process. Information asymmetry here refers to the typically greater divergence in content knowledge and the extent of information sharing between the project manager and the external supplier; compared to between a project manager and internal KONE employee.

This problem can be compounded through the contractor selection process, since upper management has a heavier involvement here. Upper management have a higher level of construal, more abstract selection criteria, lower content knowledge and are typically less able to comprehensively evaluate the espoused schedule to identify optimistic bias. Hence, the selection process can inherently favour those contractors who present faster and cheaper estimations because upper management make the decisions.

*"Because your management, they don't know exactly in details what the application represents, so the only things they will actually check is how much and how long. At that moment you definitely have less control over the time management." (Interviewee III, 2011)*

Additionally, the importance of maintaining trusting and cooperative relationships means that it is difficult for project managers to directly challenge the temporal predictions of third parties involved in the project. Moreover, when an external contractor's schedule is questioned, they are typically inclined to defend and justify it rather than admit that it may be overly optimistic. One project manager recalled an example where, when challenged, the contractor maintained their conviction and tried to justify rather than revise their schedule:

*"It's a communication problem. Even though as a project manager you can say that it's not achievable, you have to prove it. They will claim that "we're going to use a new*

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*methodology to do development, we're going to have a staff of 20 guys… They divided the application into six streams and said that each stream is a month. They even showed that they had buffer in their schedule. I think they knew that it was going to be complicated, but I think they underestimated exactly how difficult it was going to be."* *(Interviewee III, 2011)*

Consequently, the contract approval process is such that suppliers vying for contracts are effectively motivated to present an optimistic timeframe and budget. An important aspect was that this motivation seemed to manifest to different extents. Interviewees revealed that there could be great variation between the external contractors involved in KONE Way projects, with some more likely the present optimistic schedules than others. As with dependence on colleague time predictions, excessively optimistic temporal predictions from external contractors contribute to underestimation in the overall project schedule.

In summary, the accumulation of experience with different third parties – both internal and external – is important for being able to assess the degree of confidence the project manager can have in their temporal predictions. The subsequent section will describe the effect that excessive and unjustified optimism in scheduling can have on the project manager and project workers.

### 4.3.7. Optimistic Schedules and Employee Morale in Project Execution

This section will examine the effect that imposed schedules can have on employee morale when the project team cannot reduce the project's critical path by speeding up decision-making. In these instances, reduced or imposed schedules can reduce the working morale and increase the stress levels of project managers and workers. One project manager described the way in which any motivation derived from a reduction in the schedule that she had generated diminished over the course of the project.

*"In the beginning it motivated us. I said: "this is our best guess, this is our best estimate. We put a lot of our experience into giving this schedule, and now we are asked to squeeze out seven weeks. We'll do our best". But then as the time progressed, and I could see that things just simply couldn't progress in that way that we would be able to finish so much earlier than our original schedule, then it became stressful. You see that:*

*"can we squeeze it or can we not? Are there some things that we can do in parallel or are there not?" And once these things became clearer and clearer, then you have to say: "ok, we can't do this", and we had to go back to the original schedule." (Interviewee VI, 2011)*

Thus, rather than deriving increased motivation from overly ambitious deadlines, interviewees who inherited high-level deadlines that they perceive to be unattainable routinely reported high stress levels. Several project managers revealed that such deadlines can simply be stressful rather than inspiring, and that this stress can increase over the project duration. If the project's critical path cannot be feasibly reduced to meet the espoused targets, all project team can do is attempt to finish close to the deadline. Furthermore, some project managers reported that the imposition of excessively optimistic deadlines resulted in disruptions to their work-life balances. For example:

*"They (upper management) prefer that everyone work as hard as they can to meet the deadlines, although I'm pretty sure that they understand the deadlines are pretty much unobtainable... It puts a lot of stress on me. I have a very high standard for myself, so when my management says: "we want you to do this by a certain date", I will work very hard to do that. But because I can't control everything myself it puts a lot of stress on me, and I know in the end that there's a pretty decent chance of failure. I take that stress on myself, and it also impacts on my life outside of work, so that's another issue." (Interviewee VIII, 2011)*

A more realistic schedule could arguably be more motivating and less stressful, as it is not deemed "doomed to fail" from the outset. With the imposition of unrealisable schedules, stress is seemingly inevitable and can permeate an employee's emotional state beyond the workplace. The final section in this Results chapter will summarise the important aspects of the project-planning environment for the purposes of this research.

## 4.4. Summary of the Project Planning Environment

In sum, project managers face several challenges, scheduling dependences, and obstacles to project completion from the organizational environment. Project managers can be faced with dependence on schedules from third parties for project subcomponents as well as be presented with high-level deadlines from upper

management. They also face complexities arising from the multinational environment at the cultural, national and individual levels. As established, the way in which project managers try to generate unbiased and realistic time predictions under these conditions (providing that it is in their power to do so) is through the accumulation and consideration of environmental experience and project content knowledge.

The project scheduling process and key planning considerations suggest that project managers could increase their planning accuracy and implementation efficacy by developing experience in the project content, as well as with different cultures, local units, individuals, and external suppliers. However, the interviews also revealed that although such experience was accumulated individually, there exist both cognitive and practical barriers to the sharing and consideration of experience in KONE Way projects.

Moreover, the way in which scheduling responsibilities can be assumed by higher hierarchical levels, as well as the social context within which predictions can be generated inject further complexity into the planning environment, appearing to contribute significantly to optimism in prediction. The following Discussion chapter will relate and compare these empirical findings to the existing literature, to deconstruct the key elements of the planning fallacy in the empirical context.

# 5. Discussion

This chapter will discuss the prominent variables identified that could influence optimistic prediction bias in a MNC, and compare and contrast these with the relevant literature with the intention of bridging the gap between theory and practice. This will first entail an evaluation of the prominent factors at the project level (i.e. specific to the project manager), starting with a discussion of how distributional information is considered in project planning and shared within the organisation. By definition, it is perseverance with an overly optimistic schedule despite the availability of contradictory distributional information that constitutes the planning fallacy. Hence, as this section will discuss, the sufficient adoption of the outside perspective not only involves identifying and accessing relevant distributional information, but also explicitly basing the present prediction on this information. Subsequently, the potential for cognitive and memory biases to result in the underestimation of training durations will be discussed.

The chapter will then examine the variables categorised as at the portfolio level (i.e. arising from factors elsewhere in the organisation, beyond the individual project). This involves a discussion of how an individual's position within the organisational hierarchy can influence their planning-related motivations and way in which they conceptualise a project. One positive aspect of the GD planning environment was that employees were not offered financial incentives for timely project completion, something revealed by Byram (1997) and Buehler et al. (1997) to exacerbate optimistic prediction bias. However, the Results revealed that while organisational pressures in the case company did not take the form of tangible incentives for speed in completion, there was still an implicit push from above for ambitious scheduling. This section will also involve a discussion of the influence that the social environment can have on prediction optimism discussion, as well as the practical implications of these portfolio-level factors for the justification of upper management intervention and employee stress and job-satisfaction. Finally, the discussion will be summarised by showing how the prominent environmental variables along with an inherent cognitive and motivational inclination can manifest in the detrimental component of the inside perspective: scenario thinking.

This is illustrated in an "Empirical-Conceptual Model", intended to summarise the tendency to exhibit optimistic bias in the MNC context.

## 5.1. Debiasing Predictions at the Project Level

### 5.1.1 The Application of Distributional Information

A core component of the interview plan was a discussion involving the different considerations involved in temporal planning. The aim of this discussion was to gauge the depth and prevalence of the outside perspective in relation to the inside perspective in temporal planning. The results revealed many consistencies alongside some contentions with the existing planning fallacy literature. Interviewees consistently revealed that both their project content knowledge and their own personal experience were critical considerations, and the first to be drawn upon when formulating temporal predictions for current projects. As this section will discuss, consultation between colleagues can not only enhance the outside perspective by increasing the pool of distributional information, input from neutral individuals also injects further objectivity into predictions.

Project content knowledge and personal experience work in parallel to help generate predictions. Firstly, a deep understanding of the project contents enabled tasks to be unpacked and the schedule to be planned in greater detail. Additionally, knowledge attained from personal experience helps the project manager evaluate how long each of these individual tasks should take, as well as an idea of how long a project milestone or rollout should take to achieve overall.

As described in the Results chapter, the capacity to break up the project into subcomponents is positively related to the planner's project content knowledge. In this project management context, this entails the generation of a work breakdown structure (PMI, 2008), which effectively parallels with Kruger and Evan's (2004) task unpacking from planning fallacy theory. This means that individuals directly involved in the project with lower levels of construal should be able to generate a more comprehensive inside perspective than those in upper management positions.

Thus, content knowledge will enable a project manager to break the project into subcomponents, and generate a plan of how long it should take *if everything falls perfectly into place.* This means the a schedule derived from content knowledge alone would be a prediction of how long the project would take in the absence of external interruption; i.e. the *best-case scenario.*

This is where the other forms of experience – experience with the environmental variables – come in. The consideration of how these environmental variables (e.g. the differences between countries or individuals involved in the project) might extend the project's actual duration is what removes the schedule from the best case. Hence, it is essentially in these factors that considerable uncertainty is introduced into the planning; implying that past experience with these becomes particularly valuable for planning accuracy.

In comparison to technical content knowledge, these environmental factors appear to exhibit significantly more variability since they are subject to the unpredictability and divergences of human nature. Consequently, historical information is arguably more difficult to accumulate and more sparsely distributed across a global organisation. There should therefore be considerably greater scope for the sharing of experience between project managers and others within KONE Corporation regarding these variables.

The importance of applying relevant historical information for planning accuracy becomes particularly pronounced when project managers become dependent on internal or external third parties for the predicted durations of project subcomponents. The interviews revealed that prior experience with the individuals or companies making the predictions was often very valuable in enabling the project manager to gauge how much confidence they should have in the timeframes presented to them.

The strong emphasis project managers generally placed on their own experience when formulating temporal predictions appears to conflict with Buehler et al.'s (1994) assertion that individuals tend to disregard historical information when planning for the future. However, the planning fallacy account suggests that while individuals are aware of the past, they tend not to apply it to their present predictions to the extent that they

could. This appeared to be the case in this research, both at the individual level and particularly at the collaborative level.

The Results suggest that at the individual level, project managers may not apply distributional information to its full potential. There was still some evidence of attributional processes and a tendency to downplay the importance of one's own past planning failures, as consistent with Buehler et al.'s (1994) account. This was supported by the quantitative analysis, which revealed a tendency to consistently predict that future rollouts will take less time than both past and present rollouts. When considering the figures available in Appendix B, one must acknowledge that learning from previous rollouts should mean that future rollouts could take less time. However, such dramatic and consistent differences between predicted and actual durations are still seemingly indicative of over optimism in this context. Thus, despite the simplicity of the analysis and the limitations outlined in the Research Method chapter, these results still provide a fairly incisive illustration of the systematic inclination to perceive the future as "better" or "easier" than the past; consistent with research by Weinstein (1998(b), as cited by Armor and Taylor, 2002).

In addition, although it was difficult to clearly identify with semi-structured interviews, Roy et al.'s (2005) memory bias account could also be considered here. This posits that rather than disregard past experiences, individuals simply misremember their actual durations, thereby introducing optimistic bias to present predictions. This notion is supported by the apparent contrast between project managers' emphasis on historical information in the interviews, and the significant difference between past/ongoing and predicted rollout durations in the quantitative analysis. Planners may generally intend to base their predictions on past durations, however the actual durations of these could be misremembered.

In the organisational setting, it is conceivable that both attributional processes and memory biases could work together in distancing future predictions from actual past durations. The recommendations of this research will therefore take the potential for attributional processes and memory biases at the individual level into consideration. However, since project managers already widely recognise the importance of their own

experiences, most of the practical implications are concerned with enhancing the integration of others' experiences into temporal prediction.

This apparent under-utilisation of distributional information was even more apparent at the collaborative level. A multinational organisation such as the case company KONE has a large number of employees, and consequently a large amount of collective experience that can be drawn upon. Through lateral collaboration, a project planner can increase their pool of distributional information exponentially. In an environment where experience is upheld as a particularly useful tool in the project manager's belt, and in accordance with the espoused importance of distributional information for project planning accuracy, it follows that lateral collaboration should be encouraged and undertaken as much as possible in the temporal estimation process.

However, while project managers generally regarded their own experience as one of the fundamental planning considerations, they admitted that they did not apply the experiences of their colleagues to the extent that they could. This research suggests that the incorporation of others' experience could improve temporal prediction accuracy by providing a more comprehensive outside perspective. In short, this is consistent with the fundamental argument for the existence of the planning fallacy: that there is insufficient consideration of distributional information in temporal prediction (Kahneman and Lovallo, 1993; Kahneman and Tversky; 1979 as cited by Buehler et al., 1994).

This section will now discuss the four primary reasons identified in the Results chapter that explain why such environmental experiences are not typically shared and applied to the extent that they could be KONE Way project planning. The first two work in parallel, and are considered to exist due to both cognitive biases as well as circumstance, whereas the second two are more straightforward as they are purely circumstantial. These will be discussed below, in relation to the nature of the experience being shared.

Firstly, the results suggest that a project manager's perceived reference class of comparable projects and project subcomponents (from which outside experiences could be beneficial for consideration in prediction generation) is smaller than the reality. Based on the findings of Buehler et al. (1994) and Lovallo and Kahneman (2003), this

is suggested to be due to both the inherent asymmetry of information between project managers as well as the cognitive processes individuals undertake when distinguishing relevant from irrelevant detail. These work in tandem to reduce the perceived relevance of others' experiences. Firstly, since people naturally have less of an understanding of others' projects (past and present) than they do of their own, the similarities across projects may be less clear than when comparing between projects the individual has been personally involved with. Moreover, cognitive attributional processes mean that individuals are already predisposed to discounting the relevance of distributional information, and tend to attribute past planning failures to external and specific interruptions that they consider unlikely to reoccur (Buehler et al., 1994; Lovallo and Kahneman, 2003). This suggests that individuals are especially inclined to reduce the subjective relevance of others' experiences if they contradict the plan that they have developed for their own project.

Offsetting these factors involves raising the accessibility and perceived relevance of others' experiences, so that project managers can use this distributional information to enhance the outside view. Since some interviewees suggested that there are essentially many similarities between KONE Way projects, although these are not always immediately visible, this would entail the reducing of historical information to its more conceptual level. This way, individuals are less likely to get caught up in the specific, superficial details and discount the information as irrelevant to them. Moreover, encouraging knowledge sharing at the more conceptual level should help increase the visibility of the similar elements between projects, thereby offsetting the inherent information asymmetry.

Aside from these more cognitive explanations for the insufficient sharing of information, there are two practical reasons. These are the time constraints that project managers face that reduce the time available for drawing on others' experiences, and the fact that project managers may not know who has experience in different areas. These can be moderated by more practical implementations. To address the former problem, this entails finding more efficient means of sharing relevant information. For the latter, it means facilitating communication within the organisation and increasing the visibility

of individuals' specific areas of expertise so that people know whom to turn to without relying too heavily on their own personal network.

To deepen the conceptualisation of how peripheral historical information gets overlooked in planning, past experiences can be separated into two separate aspects: conceptual and specific. The former is the broadly applicable attribute of the past experience, since it concerns core elements that are fundamental to all KONE Way projects. In contrast, the latter involves the specific, non-replicable attributes of individual project variables; for example experience with a specific individual or company. The results suggest that each type of experience has its own respective factors that can predominantly explain its limited inclusion in current temporal prediction. In terms of the barriers to the consideration of others' experiences in predictions discussed above, the first two factors primarily explain the limited inclusion of conceptual information, while the last two are the main obstacles to the omission of specific information.

Therefore, the identification and inclusion of others' conceptual experiences in temporal prediction seem to be hindered primarily by basic attributional processes, and further impeded by information asymmetry. This could be due to the cognitive difficulty of separating the core conceptual elements from the superficial details. These attributional processes lead to project managers focusing too much on the specific attributes of information and ignoring the conceptual similarities, consequently classifying it as irrelevant and justifying its omission from consideration in their current plan. This was indicated by one project manager when talking about her own previous experiences, and is expected to be even more pronounced when it comes to identifying relevant conceptual experiences within their colleague's previous projects due to the inherent asymmetry of information between the two parties. This is consistent with the notion that a higher level of abstraction can also potentially benefit planning accuracy by expanding the perceived reference class (Buehler et al., 2010a; Peetz et al., 2010; Weick and Guinote, 2010); i.e. the bias-mitigating side of the '*double-edged sword*' referred to in Section 2.4.1.1 of the Literature Review.

Secondly, specific information that parallels across projects is more easily identifiable across projects, and hence the consideration of this in planning is less susceptible to attributional processes and more dependent on its accessibility. Because specific experiences (e.g. experience with certain individuals or suppliers) are so numerous and wide ranging, such experiences take a long time to accumulate, and the collective experiences of project managers must far outweigh those of one. Hence, the inclusion of more specific historical information is more contingent on the practical feasibility of sharing information; i.e. the ease of networking and competing time demands.

Clearly, in practice, collaboration between colleagues could go beyond the sharing of distributional information alone. Project managers could also consult with their colleagues outside of the project to get an outsider's perspective on the schedule. As established by Buehler et al., (1994, 2010a) and Newby-Clark et al. (2000) these objective observers should be relatively immune to the cognitions that result in too narrow a planning focus since they do not share the motivation for early completion to the same extent as the actor. Neutral observers are also more likely to include distributional and peripheral information in prediction generation (Buehler et al., 1994, 2010a; Newby-Clark et al., 2000). This suggests that those sharing their experiences with others might also find it easier to identify areas in which their own experiences might be relevant to their colleague's project.

There is a mix possible measures that could encourage and enable the sharing and integration of relevant experiences in time prediction generation. Firstly, the organisation needs to clearly convey the importance of historical information in planning – especially negative experiences – with particular emphasis on conceiving past experiences at their conceptual level to overcome attributional biases and other cognitive processes that hinder the incorporation of such information. Secondly, accurate historical information should be archived and easily available to project managers, to enable them to access objective historical data and overcome memory biases. Third, the organisation needs to facilitate efficient and effective communication between project managers and others in the organisation that may have relevant experience. This could be done through a networking tool that lists the experiences and responsibilities of individuals at their more conceptual levels, to enhance their perceived

relevance, reduce the heavy reliance on personal networks, and reduce the time involved in the consultation process. This needs to be accompanied by a strong emphasis on the importance of drawing on others' experiences for planning accuracy, to encourage planners to actually use the resources available to them. Finally, project managers could go beyond basic knowledge sharing to more extensive collaboration (i.e. getting one another to review the schedule itself rather than just provide historical accounts), to benefit from an outsider observer's perspective that should be inherently more objective. These practical implications for KONE Corporation will be discussed in more detail in the Recommendations chapter.

### 5.2.2. Expert Biases in Training

This section will discuss the tendency to underestimate the duration and intensity of training required for a novice user of a new solution, using the project rollout phase as an example. The interviews suggested clear potential for optimistic biases in the prediction of training durations in rollouts. Since the training of key users is a central component of the rollout, if insufficient time is allocated for training it can create delays in the rollout itself, as well as any other projects that the resources doing the training are involved with. In addition, if local users are insufficiently trained, this can create problems later on, and limit the realisation of benefits because local employees may not use the solutions correctly or to their full potential.

The underestimation of training durations appeared to arise from a number of factors. Firstly, expert cognitive biases mean that the appropriate training duration for the "mean user" could be routinely underestimated. The mean user can be defined here as the person that requires the average amount and duration of training to be able to use the solution competently for its intended purpose. Secondly, the failure to accommodate for individual differences could result in the underestimation of the time required to train those with less relevant experience or slower learning capacity than the mean user. Thirdly, the cognitive heuristic whereby individuals perceive their close associates more favourably means that excessive optimism can still permeate the temporal prediction for training, even when individual differences are accounted for.

Firstly, expert biases can result in the underestimation of the time required to sufficiently train the mean user. Interviewees acknowledged that project managers and team members routinely failed to appreciate the difficulty new users faced, and hence underestimated the amount of training, communication and support required to provide them with an adequate understanding of the solution. This is consistent with Hinds' (1999) expert bias, where experts systematically underestimate the duration required for novices to complete tasks.

In this case, this bias could occur for reasons consistent with those proposed by Hinds in her description of the problem: firstly, due to their intensive involvement with the new solution, experts have difficulty recalling what it is like to encounter the solution for the first time. This is consistent with the Roy et al.'s (2005; 2008) memory bias account. Moreover, they could generate a prediction for training duration by anchoring and insufficiently adjusting from the time it would take them to complete the same training process personally (which is already optimistic due to memory bias).

In addition to this prediction for the mean user, the identification of individuals that deviate from the mean user is critical for scheduling accuracy. Similarly with the best-case scenario generation with rollout scheduling overall, this research proposes that best-case scenarios are also generated when planning for training. Interviewees repeatedly acknowledged that not all individuals are the same, and that problems and planning inaccuracies arise when they are treated as such. However, some also revealed that when training is conducted, the people involved in planning the training routinely underestimate the capacity for individuals to be able to learn. Firstly, this could be because all individuals that require training are treated as the "model case", and thus underestimation ensues when they deviate from this in practice.

Furthermore, even when individual differences are acknowledged, they are not always adequately accommodated for, and excessive optimism about their capacity to learn can permeate the schedule. One project manager who vehemently advocated the notion that individual differences must be recognised and planned for still admitted that optimism can prevail even when skill inadequacies are clear:

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*"Maybe we are a little bit too optimistic; we want to give the opportunity to a person to learn, and we think that person will learn, without realising: 'Ok, that person is not able to learn'." (Interviewee I, 2011)*

This is consistent with the notion that overly positive self-evaluations and optimism about personal ability can extend to others that an individual is in close contact with (Brown, 1986; Taylor and Brown, 1988). This is perhaps emphasised by the project manager's motivation for timely project completion; since they want to believe that the individuals involved in the project will be able to learn and complete their respective tasks in a timely manner.

These factors present several implications for measures to improved prediction accuracy in training duration. Planners need to be made aware that greater expertise and experience with a solution means greater susceptibility to optimistic bias in this area. Consultation with others (for example more objective individuals and intermediate users) could help make the prediction of the mean user's training requirements more realistic. Additionally, individual differences need to be considered and planned for in training. Planners need to be confident and supportive of their colleagues whilst being mindfully objective about their individual capabilities and capacity to learn. Ideally, all employees would be rapid learners, perfectly adaptive to change and highly motivated. However, the results suggest that this is not the reality, and so individual differences need to be accounted for in the interest of planning accuracy.

## 5.2. Debiasing Predictions at the Portfolio Level - Hierarchical level and the Social Context

Various sources were identified in the results chapter through which higher levels of organisational hierarchy become increasingly prone to exhibiting optimistic prediction biases. These will be discussed in this section, which encompasses a discussion of the differences that arise with a change in hierarchical level along with the practical implications of this for the empirical planning environment. Broadly, the findings relating to this section provide empirical support for the notions of Construal Level Theory (CLT) (Liberman, et al., 2002; Liberman and Trope, 2002; Liberman and Trope, 1998; Trope and Liberman, 2003) power bias (Guinote, 2007; Weick and Guinote,

2010), motivational theory (Buehler et al., 1997; Byram, 1997) and social context theory (Buehler et al., 2005; Kahneman and Lovallo, 1993; Pezzo, et al., 2006).

This section will first discuss the differences between organisational hierarchical levels with respect to motivations, the level of construal and cognitive biases. It then briefly addresses the implications of these for related practical issue – the contract approval process. The potential impact of the social context in which temporal predictions are often generated on optimistic prediction bias will then be discussed, followed by an evaluation of how excessive and unjustified schedule reductions can impact employee motivation and morale in the project execution. Finally, this section will be summarised with an overview of the practical implications regarding upper management intervention in project scheduling. Since it naturally pertains to each area, the implications for temporal proximity of planning will be discussed throughout this section.

As clarified in the results chapter, there are different reasons for upper management intervention in scheduling – some justifiable and some not. However, this does not mean that all forms of upper management intervention will inevitably lead to unwarranted optimism in planning. Intervention is only considered to be bias-inducing if it occurs in the absence of sufficient justification; i.e. if intervention cannot in itself speed up the actual duration of the project. Further, the planning fallacy can only be evident at higher levels of hierarchy if such biased intervention is contradicted by historical information (Buehler et al., 1994, 2010a). Thus, this section will simply discuss the tendency for individuals to systematically underestimate project durations based on their relative hierarchical position. In practice it is the responsibility of those involved in planning to be conscious of these implications so that upper management intervention is managed so that it is not detrimental to planning accuracy.

### 5.2.1. The Fundamental Differences Between Hierarchical Levels

This section will outline the fundamental differences in the way different hierarchical levels mentally construe internal development projects and consequently the perspectives they adopt when formulating schedules. The underlying areas of difference are in the respective strengths of the motivation for speed in completion, the level of

abstraction at which the project is understood, and consequently the relative conceptualisation and application of inside and outside perspectives in temporal prediction.

By analyzing these differences, this section aims to align the results with the existing literature to show how individuals at higher hierarchical levels have an increased propensity to underestimate task duration. The practical implications of this will then be addressed in further detail in section 5.2.5. When comparing and contrasting aspects of the different levels of organisational hierarchy, this section will predominantly refer to the differences between project managers and upper management. This is because these are the two levels of hierarchy for which these implications are most relevant. However, it is important to keep in mind that these phenomena are expected to extend beyond these two levels, and the directional relationships should hold for both those below the project manager in the project team as well as for the very top management.

The ways in which different motivations and objectives are aligned and prioritised have a significant impact on the susceptibility of different individuals and groups to optimistic biases in temporal planning. Every party involved in an organisational project arguably has some motivation for timely completion of tasks and projects, however the extent and construal level at which this motivation manifests itself, as well as how it is prioritised among other possibly conflicting motivations (such as the motivation for output quality) can significantly influence the propensity to underestimate.

In this case, it is proposed that the higher the hierarchical level of a KONE Way project stakeholder, the greater the motivation for fast completion of the project (and hence intrinsically of one of its constituent phases). This is because the higher the hierarchical level, the broader the global perspective is and the greater both the motivation and the responsibility for the realisation of benefits from global harmonisation. This means that the motivation for timely project completion becomes comparatively intensified at higher levels. Based on the findings of Buehler et al. (1997) and Byram (1997), this implies that in practice, the propensity for upper management to exhibit optimistic prediction biases should be greater than those with comparatively lower motivation for speed in completion.

Furthermore, the results showed that the degree of motivation for speed in completion corresponded closely with the level of abstraction at which the project was construed. These results are consistent with the research of Weick and Guinote (2010), who found that more powerful individuals tend to construe tasks at a higher level, and experience higher motivation to see them completed more quickly and successfully. Moreover, it helps substantiate the notion that individuals focus more upon outcome desirability than feasibility at higher levels of construal (Liberman and Trope, 2002; Trope and Liberman, 2003). Practically this means that upper management tend to prioritize task information differently to their subordinates by focusing more on the desirable outcome and less on potential barriers to completion.

This implies that at the upper management level, thoughts of successful completion and the emphasis on anticipated benefits tend to perpetuate attributional process that prevent the possible expansion of the conceived reference class; so a higher level of construal is not expected to result in the increased integration of comparable projects in this case.

Guinote (2007) suggests that at the basic cognitive level, power enhances the tendency to selectively emphasise readily accessible information to the detriment of secondary and peripheral information. Accordingly, Weick and Guinote (2010) found that power results in more optimistic time predictions. They found this to be mediated by the tendency of people experiencing greater power to focus more on the desirable outcome than possible impediments to smooth and timely completion. This cognitive focus can also be conceived in terms of CLT, where power results in greater abstraction. Powerful individuals appear to formulate higher-level construals of tasks, thereby overlooking impediments to completion (Weick and Guinote, 2010).

This means that unlike what was predicted to help project managers overcome attributional processes and perceive a greater number of experiences as relevant, a higher level of abstraction is not expected to expand the conceived reference class for individuals in upper management positions. Any possibility for a higher level of construal to induce an increased consideration of distributional information in this case would be mitigated by upper managements' stronger desire for speed in completion, the

greater focus on a successful outcome and the tendency to overlook barriers to completion.

Upper managements' strong motivations are evident in potentially significant difference that can exist between the degree of influence that they exert on a schedule compared to the degree of justification they have for such influence. Several interviewees readily recalled cases of extensive upper management intervention seemingly in the absence of sufficient justification, although it must be acknowledged that the interviewees were almost all project managers, which intuitively skews the sample toward finding these results.

As previously established, it is in these instances where the rationale for intervention is insufficient that such intervention induces optimistic prediction biases. However, this rationale for intervention is a grey area, since upper management justification is subject to their perception of how such intervention will impact the actual project completion duration. The appropriateness of schedule intervention in practice is a particularly important issue, which will be covered in more detail in section 5.2.5. This section will focus primarily on the tendency for upper management to build a case for intervention upon invalid premises.

Most importantly, using the benefits that will be realised upon completion (which appears to be upper managements' predominant source of motivation for timely completion) as justification for doing something faster is effectively confusing the end with the means. Hence, basing such decisions purely on the desire for benefits to be yielded sooner is insufficient and irrelevant, since it provides no direction for how the subcomponent durations will actually be reduced.

This notion of strong upper management emphasis on desirable outcomes – even to the point that the anticipated outcome effectively becomes the rationale for cutting the schedule – is consistent with Weick and Guinote's (2010) power bias account. Furthermore, the expectation that the project team could feasibly speed up project completion in the absence of concrete justification could also indicate the presence of Langer's (1975) illusion of control. This would suggest that upper management's strong motivations for fast completion lead them to hold the conviction that if they impose an

ambitious deadline, the project team should be able to rise to meet that deadline, regardless of what the objective evidence advocates.

In addition, the relative level of abstraction could help explain why some interviewees reported that upper management typically want to wait until later in a project's duration before adjusting the schedule to accommodate for a potential obstacle. Revising optimistic schedules too late in a project can be problematic due to the interdependencies between projects and rollouts. By waiting until the last minute to revise the deadline, the possibility to plan accurately within the rollout, as well as the planning of other rollouts is disrupted (due to shared resources and other interdependencies).

This observation that upper management typically prefer to delay making amendments to project schedules is consistent with CLT (Liberman and Trope, 1998, 2002; Trope and Liberman, 2003), which posits that more powerful individuals need to be temporally closer to the manifestation of a delay to be able to conceptualise it concretely. Since project managers construe project obstacles at a lower level than upper management, they should perceive a potential delay in the project as more feasible at relatively greater temporal distance. Upper management therefore need comparatively closer temporal proximity to increase their perceived saliency and feasibility of obstacles to completion and competing time demands (Liberman and Trope, 1998; Trope et al., 2002; Trope and Liberman, 2003; Zauberman and Lynch, 2005). Moreover, the availability heuristic concept and supporting literature suggest that individuals are unlikely to actively seek out additional information regarding these potential obstacles, and are typically content with the information they have readily available (Fischhoff, Slovic, and Lichtenstein, 1978, as cited by Byram, 1997; Tversky and Kahneman, 1973; 1974).

This mindset could perhaps indicate a tendency toward a means of reasoning that conflicts with objective probability. Discouraging the inclusion of potential completion barriers in the project plan based on the low likelihood of each of them occurring can be considered fallacious, since these potential obstacles are being judged on their individual probabilities. Planning fallacy literature advises against such reasoning, since

the likelihood of at least one obstacle realising in practice is substantially higher than the probability of one given obstacle being realised (Bar-Hillel and Neter, 2002; Kruger and Evans, 2004; Tversky and Kahneman, 1983).

Again, while these proposals are consistent with theory, as mentioned in the Results chapter upper management can have legitimate reasons for refraining from schedule extension. Therefore, the actual impact of construal level on the timing of schedule revisions is also dependent on the extent to while upper management believes that maintaining an ambitious schedule in the face of increasingly significant obstacles will benefit the actual completion duration. The final section within this Discussion chapter (Section 5.2.5) will prescribe a way for upper management to effectively evaluate whether intervention is appropriate in a given circumstance, along with a discussion of the implications for managing the temporal proximity of schedule adjustments. The following section discusses a further area in which the level of power within the organisation can influence decision-making and the subsequent accuracy of the project schedule: the contract approval process.

### 5.2.2. The Contract Approval Process

This section will discuss the influence that hierarchical difference can have when evaluating the accuracy of others' predictions, upon which the project schedule may become dependent. It can be inferred from the inherent differences between hierarchical levels established above that upper management might not provide the most objective evaluations of third-party predictions. This is important, since decisions regarding the approval of supplier contracts are typically made and approved at the higher level. Due to the ensuing incentives for winning contracts and the level of abstraction at which tenders are reviewed and compared, the risks of optimistic biases permeating the project timeline are increased.

This tendency for inbuilt underestimation of a project subcomponent is detrimental to the accuracy of the project schedule overall. At best, this could entail somewhat optimistically biased supplier schedules, and at worst it could eventuate in the *winner's curse*, whereby the approved (or 'winning') schedule and budget are headed for default from the outset and both parties are left significantly worse off (Thaler, 1992). The

implication of this is that project managers should be more heavily involved in the decision-making regarding contract approval. The results suggest that they should be more likely to incorporate a wider range of information into their decision than their management, and consequently make a more objective evaluation.

### 5.2.3. The Social Context and Heightened Optimism

In addition to these underlying differences between hierarchical levels is the social context in which prediction generation can take place. Up until this point, the discussion has focused on predictions made by different individuals. However, these predictions are rarely – if ever – made alone in an organisational context (as revealed in the interviews, as well as suggested by Buehler et al., 2005). Thus, while planning fallacy theory suggests that schedules formulated by a given upper management employee should be inherently more optimistically biased than those generated by their subordinates, the social setting in which these predictions are formulated can further exacerbate this bias. This section will discuss the rollout kick-off meeting specifically to emphasise some of the specific attributes of intra-organisational collaboration that can increase optimistic prediction biases.

In accordance with the existing literature, this research posits that the social environment of the rollout kick-off meeting can exacerbate optimistic prediction bias in a number of ways. As clearly established in the results chapter, the rollout kick-off meeting is a circumstance in which optimism and enthusiasm is at its peak. The inclusion of a high proportion of upper management employees can both increase the susceptibility to power biases (Guinote, 2007; Weick and Guinote, 2010) as discussed above, as well as suppress disagreement and encourage a heightened sense of enthusiasm and team spirit. Buehler et al., (2005) suggest that there is an inherent tendency to exhibit heightened optimism in a group setting for want of fitting in, and Kahneman and Lovallo (1993) and Lovallo and Kahneman (2003) posit that this is intensified in an organisational setting, where pessimism is inherently perceived as disloyal and uncooperative. Additionally, these are accompanied by an increased focus on positive future outcomes and less on potential complications or barriers to completion (Buehler et al., 2005). There is also an increased focus on positive (group) attributes (Ibid, 2005), which could be further exacerbated by the tendency of group

members to evaluate those within the group excessively favourably (Brown, 1986; Taylor and Brown, 1988).

Thus, aside from the inclination for upper management to exhibit optimistic biases in prediction due to their higher level of construal and stronger motivation for speed in completion, the implicit encouragement of optimism and inherent aversion to disagreement in the group setting appears to intensify biases in prediction. Consistent with this, several interviewees highlighted the emphasis on optimism and the suppression of pessimism at kick-off meetings. Clearly, no one wants to appear uncooperative in this environment, and optimistic biases can thereby permeate the rollout deadlines that are developed at a high level of construal and agreed upon in the height of positivity and optimism.

Moreover, longer rollout schedules could be inherently more optimistically biased due to the greater temporal proximity between the prediction and completion dates. This is not only consistent with CLT as outlined above, but also with recent research by Peetz et al. (2010), who found that the relationship between optimism and temporal proximity is mediated by the types of information that are most focal during planning. In the rollout kick-off meetings in particular, the focus appears to be overwhelmingly situated on the desirable outcome, with pessimism and hence the tendency to dwell on barriers to completion being inherently suppressed. Longer rollout duration could also involve a greater degree of unwarranted initial confidence in the espoused schedules, even though these are likely to be more optimistically biased. This is in accordance with Naussbaum, Trope and Liberman (2003), who found that confidence in predictions made at greater temporal distance tends to be higher. The consideration of temporal proximity in schedule generation will be discussed further within Section 5.2.5.

In summary, these results show how the influence of more powerful employees and the social setting in which this occurs can accentuate optimistic bias in prediction. Prediction generation at higher organisational levels can lead to the skewed prioritisation of information types and the overlooking of important considerations and potential obstacles, due to the higher relative cognitive difficulty in conceptualising them concretely at greater temporal distance. To the detriment of scheduling accuracy,

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plans made at higher levels of organisational hierarchy are based on more abstract, high-level conceptualisations, with greater motivation for speed in completion, and in the heat of positivity and socially heightened optimism.

### 5.2.4. Impact on Employee Morale

Thus far, the effects an individual's level of hierarchy (or power base) and the collaborative environment can have on the propensity for optimistic prediction bias have been discussed. This section will now discuss the effect these optimistic schedules can have on the project team during the project execution period. Apart from the negative economic implications of scheduling inaccuracies, imposed or reduced schedules can have detrimental effects on the morale of the project team that complete the work. As established in the results, ambitious deadlines can be motivating at first, with the project manager eager to see what they can do. However, this quickly dissipates over time as the realisation dawns that the espoused deadlines are becoming increasingly unattainable, until only stress is left.

Several interviewees reaffirmed Buehler and Griffin's (2003) belief that complex organisational projects are often subject to factors that are beyond the control of the planning individual's best intentions and efforts. When overly optimistic project schedules are imposed upon project managers, all they can do is simply "do their best" to get close to the management-espoused deadlines. Furthermore, since their capacity to reduce the actual completion time is limited, any "motivation" the project team initially derive from these ambitious deadlines is quickly quelled and replaced by stress.

This parallels with Buehler et al.'s (2010b) findings regarding the effect of optimistic deadlines on task completion behaviour. Since the complex and multifaceted nature of internal development projects makes them unequivocally 'open', theory posits that any initial change in completion behaviour induced by ambitious deadlines should quickly diminish over the course of the project. In the same way, the results here show that any initial increase in motivation and morale soon diminishes over the course of the project as it becomes increasingly apparent that scheduling delays will ensue, and that no change in completion behaviour can make the deadlines any more attainable.

These results therefore support and build upon Buehler et al.'s findings that changes to task completion behaviour diminish over the course of an open task. Overly optimistic deadlines do not reduce actual completion time for open tasks in the same way that they can for closed tasks (Buehler et al., 2010b) since there is far more variability, complexity and external interruptions that prevent substantial differences in actual completion time to be realised. Consistent with this, these results show that as this happens any motivation and working morale obtained at the start of the project (practically indicated, for example, in Buehler et al.'s studies by an earlier start time) dissipates and turns to stress as the project manager realises that the given deadline is unrealisable.

Thus, this research contributes an emotional account to supplement Buehler et al.'s (2010b) findings; showing that not only do excessively ambitious deadlines tend to be optimistically biased for open tasks, but that stress levels positively correspond with the realisation that this is the case. That is; as it becomes increasingly apparent that the initial predictions were too optimistic, the project manager's stress levels increase in parallel. Moreover, if the deadline is excessively optimistic and in direct contrast to historical information, the project manager might identify the schedule to be overly optimistic from the start, and therefore experience no additional motivation but stress from the outset of the project. In accordance with temporal proximity theory, this stress should still increase over time as the impending deadline approaches and the delay becomes increasingly salient.

In summary, if the actual completion time cannot be reduced by ambitious deadlines due to rigidities in the critical path, then ambitious imposed deadlines are simply demoralising. Moreover, since theory posits that this will generally be the case for open tasks (Buehler et al., 2010b), upper management need to be particularly careful that their intervention in a schedule can actually induce reductions in the critical path. Otherwise, such intervention will only serve to perpetuate scheduling inaccuracies, increase stress levels and lower working morale.

### 5.2.5. The Implications for Upper Management Intervention and Temporal Proximity

This section aims to conclude the analysis of bias-inducing factors at the portfolio level with a discussion of the implications for upper management intervention and the management of temporal proximity in planning. Overall, these results illustrate the dangers of upper management scheduling intervention with respect to optimistic prediction bias. Consideration of the inferences drawn here should valuable for planning accuracy, since they at least advise that caution be exercised by upper management when intervening in scheduling. These results, along with the existing literature, highlight the important inherent differences between hierarchical levels and the bias-inducing factors apparent in the social environment within organisations.

One of the most difficult issues – and one that will inevitably be surrounded by contention – is the credibility of upper management's justification for intervention. As discussed, the rationale for intervention will always be a grey area, based on the subjective perceptions of upper management regarding the work efficacy of the project manager and project team. The potential elasticity between the degree of ambition in a deadline and the speed of task completion complicates things, and conflicts with Buehler et al.'s (2010a; 2010b) assertion that prediction optimism can't significantly impact completion behaviour in open tasks.

In accordance with their strong motivations for fast completion and higher level of construal, upper management is intuitively predisposed to the assumption that the project manager and project team can always work faster than they do. In contrast, the project manager might naturally maintain that they are working to full efficiency, even if this is not the case. Despite this unavoidable complexity, consideration of the inferences drawn by this research should nonetheless be beneficial for planning accuracy, since they emphasise that caution be exercised by upper management when considering whether to intervene in temporal planning.

Perhaps the best way to address this issue and help upper management judge whether intervention in scheduling is appropriate is to *evaluate the barriers to timely project completion*. This is in accordance with research by Buehler et al., (2010a; 2010b) and

Buehler and Griffin (2003), (see pp 46-47 for a review). If internal barriers – such as a lack of motivation, procrastination, or excessive and time consuming deliberation in decision making – can be identified as most the prominent barriers to completion, then the environment is more controllable, and schedule intervention is more justifiable and more likely to result in an earlier completion time (Buehler et al., 2010a; 2010b; Buehler and Griffin, 2003). In contrast, if there is a higher proportion of external completion barriers, for example competing projects, high uncertainty regarding project variables, or insufficient or missing resources, then schedule intervention is likely to be detrimental rather than beneficial.

The effective assessment of the barriers to completion and hence the decision of whether to intervene in scheduling appears to be facilitated by the accumulation of trust and efficacy of vertical communication between the project manager and their management. The more trust there is between the two parties, the more likely it is that upper management will designate more responsibility and trust in the project manager with respect to the schedule. Moreover, as trust is strengthened, formal communication such as meetings need not be as frequent. Indeed, extensive formal communication and reporting requirements are usually characteristic of relationships devoid of trust (Kerzner, 2006). The accumulation of trust somewhat negates the necessity for extensive documentation, thereby facilitating a more efficient and informal project management environment (Kerzner, 2006). Hence, trust is developed through the maintenance of honest and effective communication, although greater trust also means that routine and formal communication need not be as extensive as otherwise.

Through the accumulation of trust, upper management should be less likely to intervene in the longer term since they will be more content that the project manager is working to their full potential and the project is progressing at its fastest possible rate. Since these results support the notion that – providing they do not exhibit the optimistic biases discussed in the preceding sections – the project manager should be the least susceptible to optimistic biases based on their lower level of construal, it is preferable that they are able to set the schedule (providing that the critical path can not be reduced by measures such as faster decision making) and that upper management accept this schedule without making excessive amendments.

This is further supported by the findings concerning the accumulation of experience during project phases. Providing that they base their predictions on distributional information (i.e. past durations), it expected that project managers should be able to predict duration more accurately in the latter stages of the rollout process. This means that a further problem with inherited schedules is that they might not improve over time. Because upper management are not conducting the work personally, their specific experience and content knowledge does not accumulate over the course of the rollout phase in the same way that it does for project managers. This means that not only are the predictions more likely to be optimistically biased from the outset of the rollout phase, they are unlikely to improve with additional rollouts because the experience is not attained by the organisational level that make the primary scheduling decisions. This implies that the reliance on and confidence in subsequent project manager predictions could arguably increase over the course of the project, since their predictions could be increasingly accurate here.

Furthermore, the results have shown that the timing of schedule generation can influence its accuracy. The implications for managing temporal proximity in the organisational context will be illustrated here using a single rollout as an example. A definitive rollout date fixed early on is considered desirable for consolidating commitment and establishing a clear target for the rollout. This is supported by Kerzner (2006), who champions clear deadlines as meaningful targets for the project team to work toward. Nonetheless, setting a go-live deadline at the rollout kick-off meeting introduces several possible complications in accordance with planning fallacy theory.

The interviews revealed that in many cases the project end-dates are finalised and agreed upon before the project sub-components (e.g. the necessary local developments in a roll out) have been identified; i.e. before the gap analysis has been conducted. This means that the project scope has not yet been properly identified. Waiting until a thorough gap analysis has been completed (so that the full scope of the project is clearer) before setting the schedule should help moderate optimism in prediction by enabling the project to be unpacked into subcomponents. This benefits planning accuracy by providing a more comprehensive inside perspective (Forsyth and Burt, 2008; Kruger and Evans, 2004). This could be possible by either conducting the gap

analysis prior to the start of the rollout (i.e. before the kick-off meeting), or delaying the freezing of a definitive go-live date until the gap analysis has been completed. Moreover, temporal proximity theory posits that if predictions are generated closer to project execution, planners will not only have more information upon which to base their predictions; they should also assign a higher probability to the potential for completion barriers and time constraints to disrupt project completion. Hence, providing that there is sufficient emphasis on the consideration of completion barriers compared with focusing on plans for success, they should be more likely to account for these in the plan (Liberman and Trope, 1998; Peetz et al., 2010; Trope et al., 2002; Trope and Liberman, 2003; Zauberman and Lynch, 2005).

However, while delaying making predictions is preferable from a planning fallacy perspective, this is more complex in practice, since competing time demands and project interdependencies mean that these measures are not always feasible. It is often easier in reality to establish and agree upon the high-level deadlines in groups at the commencement of a project phase. Thus, if planning is to be done in groups, certain considerations need to be made to help moderate the bias-inducing factors arising from the social context. Firstly, the inclusion of more neutral individuals would be preferable in instances such as the kick-off meeting where positivity and optimism are at their peak. This should provide a more balanced and unbiased perspective, since the neutral observer would not share the other parties' strong motivations for speed in completion and would be more inclined to draw upon comparable projects to assist in prediction generation (Buehler et al., 1994; 2005; 2010a; Newby-Clark et al., 2000). However, this is not always practical in an organisation, since it conflicts with the intrinsic purpose of the kick-off meeting; i.e. to bring those directly involved in the rollout together. Additionally, due to time constraints and alternate priorities, such neutral individuals are unlikely to be able to take the time to assist in the planning of something outside of their area of responsibility.

A more realistic alternative is for those involved in the project kick-off meeting (or comparable circumstances) to recognise the potential for such social environments to exacerbate optimistic biases. This entails clearly acknowledging the inherent tendency to be overly positive and 'plan for success' when collaborating in groups where all

members share the same motivations for early completion, as well, as trying to adopt a third person perspective to moderate the motivation to set overly ambitious deadlines. These should encourage group members to exercise caution when generating collaborative predictions, as well as yield some of the benefits of objectivity that could otherwise be attained through consultation with neutral observers (Buehler et al., forthcoming, as cited by Buehler et al., 2010a). The final section within this Discussion chapter will summarise the findings with respect to the theoretical constructs of the planning fallacy concept.

## 5.3. Summarising the Prominent Biases and the Best-Case Scenario

This section aims to conclude the Discussion chapter by providing an evaluative recap of the key elements of planning fallacy factors identified by this research, relating them to the implicit propensity to generate best-case scenarios, and illustrating this with a summarising Empirical-Conceptual Model. This concrete link to best-case planning is deemed appropriate since, conceptually, the combination of all biased inclinations discussed inevitably produces the very best case scenario schedule. Thus, any successful debiasing measures taken should serve to remove the espoused schedule from the best case.

This section will first discuss the inherent tendency for scenario thinking to define one's conceptualisation of the future; that is, to have virtually no difference between the best-case and best-guess project schedules. It will then go on to summarise the biases arising from cognitive and motivational factors that perpetuate best-case scenarios – firstly at the project level and then at the portfolio level. These imply that the tendency for scenario thinking also arose from the overlooking of various factors at the project management level, as well as due to the interaction between different organisational levels. The key planning fallacy contributing factors and their impact on optimistic bias are summarised in an Empirical-Conceptual Model, which is intended to complement and refine the conceptual model presented in the Literature review by narrowing it specifically to the empirical project management environment in a MNC. The practical implications for debiasing temporal predictions in internal development projects in an organisation will be discussed in the ensuing Recommendations chapter.

Best-case scenarios appeared to be the default way of thinking when a single schedule was generated. The basic notion that there exists a tendency toward best-case scenario generation is consistent with the findings of Byram (1997) and Newby-Clark et al. (2000). These showed that in practice there is little difference 'realistic' and best-case' scenarios. Within this context, this implies that the generation of a single plan should closely resemble the best-case prediction, even if there is heavy emphasis on planning accuracy (since the best-case and most realistic plans should be essentially identical). The interviews proved this to be the case.

In addition to this predisposition for best-case planning, there are organisational aspects that can both exacerbate and mitigate the tendency to plan for success, which are illustrated in Figure 3.
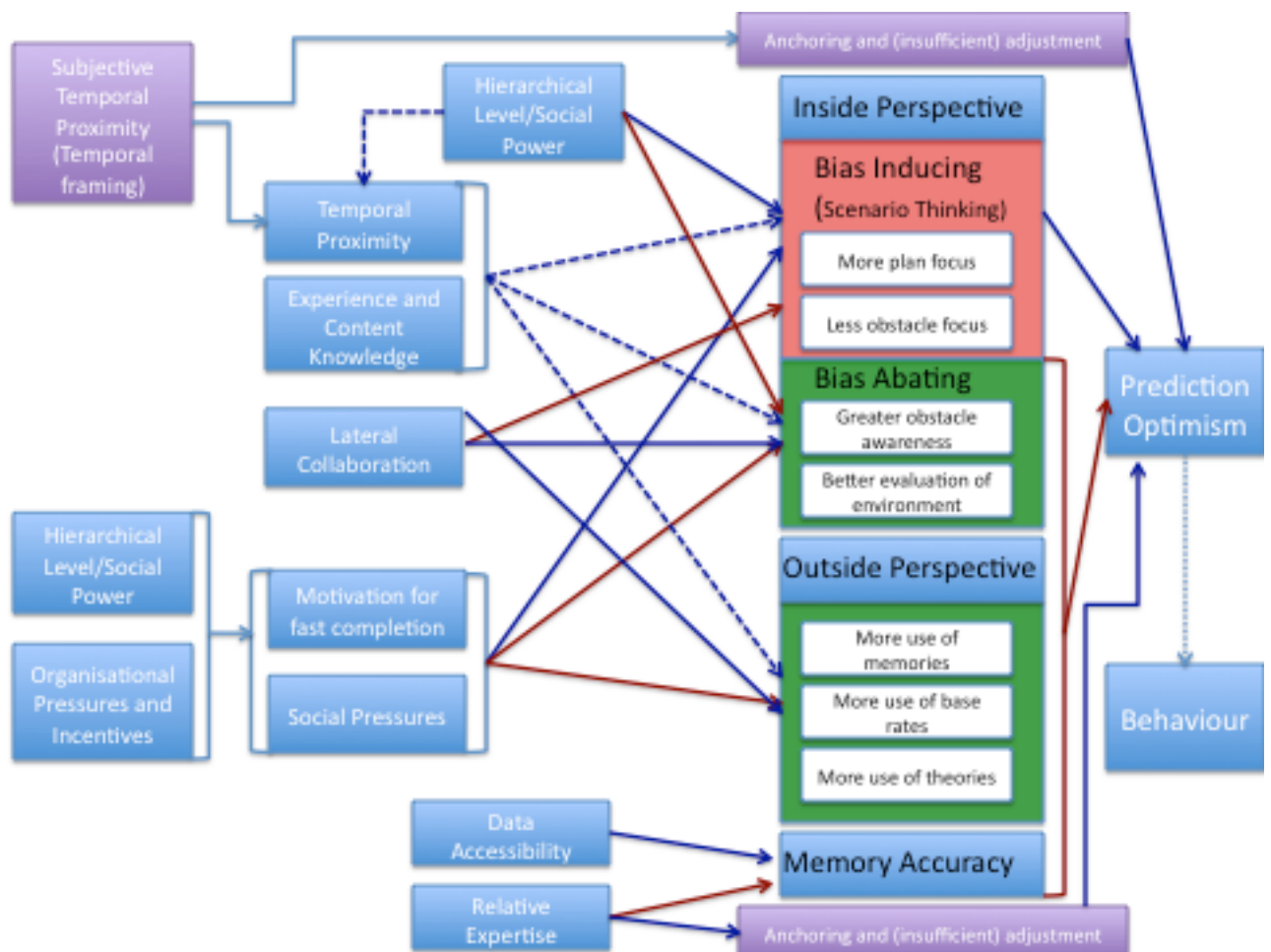


**Figure 3.** The Empirical-Conceptual Model of Optimistic Bias in the MNC Context

This is a revision and extension of the Conceptual Model from the Literature Review, which aims to incorporate and highlight the most influential variables identified that pertain to the planning fallacy in the multinational organisational context. Most of the variables' respective relationships with optimistic prediction biases in the organisational context are illustrated in terms of how they impact the adoption of the inside and outside perspectives; again based loosely on the model presented by Buehler et al. (2010a). 'Memory Accuracy' is included as another mediating variable, to accommodate for the memory and expert bias accounts. The inside perspective is separated into two different aspects, with the aspect detrimental to planning accuracy represented as 'scenario thinking'. The aspect that can help mitigate optimistic bias is represented in green, in acknowledgement of the benefits of specific environmental knowledge and breaking the project into subcomponents. This component of the inside perspective, along with the outside perspective and memory accuracy (to account for memory bias) all negatively affect prediction optimism.

Positive and negative relationships are dark blue and dark red arrows respectively. Conditional relationships are represented by dotted lines. These include the relationship between temporal proximity/experience/content knowledge and the inside perspective. As established previously, these variables are expected to positively influence whichever part of the inside perspective that is most focal at the time of planning. Moreover, they could potential result in the increased consideration of peripheral information (indicated by the conditional positive relationship with the outside perspective), providing that individuals are able to overcome attributional processes that could counter this.

Theoretical constructs that could not be examined in the research due to methodological and resource constraints are included in the purple boxes; i.e. subjective temporal proximity (temporal framing) and the anchoring and insufficient adjustment cognitive process. These are included here because although the explicit identification and examination of these was beyond the scope of this research, they are accounted for in the research Recommendations, since theory suggests that they could be moderated through simple and cost effective measures. Thus, the figure illustrates the way in which subjective temporal proximity is expected to influence prediction optimism in the same

way as objective (actual) temporal proximity (Boltz and Yum, 2010; Sanna et al., 2005). In addition, the model conveys the theoretical role that the anchoring and (insufficient) adjustment process plays in parallel to the inside and outside perspectives in influencing prediction bias, when either the temporal frame (subjective temporal proximity) (LeBoeuf and Shafir, 2009) or the relative expertise of the planner (Hinds, 1999) are varied. The inclusion of these variables in the Empirical-Conceptual model is considered to contribute to a more comprehensive picture of optimistic bias in the empirical setting.

At the project manager level, the tendency for best-case planning appeared to be mitigated through enhanced project content knowledge and the integration of experience. This is because more knowledgeable and experienced project managers should inherently find it easier to identify a possible delay, and more likely to assign it a higher probability to occurring since they are more likely to have encountered it before. Moreover, the best-case scenario is the default when aspects of the environment: i.e. the culture, country (unit) and relevant individuals are considered to be homogeneous. Careful consideration of these variables is required to prevent best-case scenarios being generated under the assumption that these environmental aspects do not deviate from the (inherently overvalued) 'average'.

Furthermore, while project managers place heavy emphasis on clearly relevant historical information, there is still a risk that these experiences are misremembered as more positive or of shorter duration than the reality (Roy et al., 2005, 2008; Roy and Christenfeld, 2008). In addition, the risk of attributional processes means that more peripheral information and past experiences with conceptual similarities yet superficial differences are more likely to be overlooked in prediction generation; particularly if they are negative experiences or if they are the experiences of a third party (due to the impediments to the incorporation of others' experiences outlined above).

Similarly, another cognitive bias identified at the project level was the expert biases that could potentially lead to underestimation of the time required to train new individuals. Making specific allowances to counter this tendency should also help remove the

resulting schedule from the best case by extending the duration of this specific subcomponent.

Thus, the variables of information accessibility (to ensure the application of accurate distributional information) and relative expertise (i.e. when planning training durations for others) are linked directly to memory accuracy in Figure 3, which is considered to complement the outside perspective and help moderate optimistic bias.

Another conditional relationship exists between prediction optimism and task completion behaviour, a link that must be carefully considered by upper management when deciding whether to intervene. The influence of hierarchical level is featured twice in the model: above to represent the risk of power bias via a higher level of construal (i.e. the direct link with the inside perspective) as well as indirectly through the possible influence on the temporal proximity of schedule revision, and at the left of the model to illustrate its effect on the motivation for timely completion and social pressures.

Hence, in relation to the organisational context, scenario thinking was seemingly perpetuated by the perception that upper management actively discouraged the incorporation of possible delays into the schedule (i.e. allowance of temporal buffer under uncertainty). This appears to be further exacerbated by the higher-level of abstraction at which upper management conceptualise obstacles to project completion, and the temporal proximity of the prospective delay. Because the delays are less focal and more difficult to conceptualise at a higher level of construal, upper management are seemingly more likely to discount their likelihood, and more inclined to wait for them to actually manifest before revising the schedule to accommodate for them. In contrast, the project manager and project team see the potential delay emerge, and due to their inherently lower level of construal find it easier to clearly conceptualise at a greater temporal proximity.

In addition, consistent with Buehler et al.'s (2005) suggestion, the social planning environment in KONE Corporation appears to amplify the individual tendency to 'plan for success'. The heightened positivity and increased emphasis on favourable outcomes, along with the suppression of contention and negativity that comes with group

interaction result in collaborative predictions that inevitably represent the best possible outcome.

In sum, this oversimplification of future outcomes and hence systematic temporal underestimation occurs due to incomplete inside and outside perspectives and expert biases at the project level, and heightened motivation for timely completion, higher level of construal, and assignment of definitive project deadlines at the portfolio level. Together, these factors perpetuate the generation of best-case scenarios, and need to be addressed to improve the accuracy of temporal predictions in organisational projects.

Project management practices and organisational planning naturally promote a single project schedule that is established either by a single individual or collaboratively, agreed upon, and communicated to project stakeholders (Kerzner, 2006; Pitagordky, 2007; PMI, 2008). It is arguably more time consuming, impractical, and inconsistent to generate and consider more than one possible schedule in an internal development project. Indeed, existing studies indicate that the generation of additional schedules should have no significant impact on debiasing the eventual adopted schedule, since the best-case scenarios tend to differ little from the most realistic (Byram, 1997; Griffin et al., 1990; Newby-Clark et al., 2000). Consequently, measures should be sought to debias (i.e. extend) the espoused scenario rather than try to influence it by generating alternate cases; i.e. promote the generation of a realistic project plan that is sufficiently distinguished from the best-case scenario that would otherwise result. This implies that quelling optimism and removing project schedules from the best case should directly entail instilling debiasing measures to target the areas discussed throughout this chapter.

In accordance with the fundamentals of prevailing planning fallacy theory this should be essentially pursued via the improvement of both outside and inside perspectives. It could be argued conceptually that, the more that distributional information and consideration of project subcomponents extends the schedule, the further the predictions are removed from the best case.

While schedules are essentially estimations of the future and as such will always be surrounded by uncertainty, there are various simple practical measures that can be easily implemented to make temporal planning more realistic. With respect to planning fallacy

theory, this essentially means the optimal consideration and application of the inside and outside perspectives in prediction generation. A complete inside view based on sound content knowledge enables all project subcomponents as well as possible completion barriers to be identified, while a comprehensive outside view provides a solid base of relevant distributional information for planners to base their predictions upon. The following chapter will outline practical recommendations that aim to promote the adoption and expansion of these views and thereby moderate optimistic prediction biases in an organisational context.

# 6. Recommendations

This chapter draws upon proven debiasing techniques and applies the prominent theoretical constructs from planning fallacy literature to the organisational environment to formulate practical recommendations for mitigating optimistic bias in temporal planning for internal development projects. As anticipated, these recommendations should be relatively simple to implement quickly and at low cost, although since they also require changes in mindset that might conflict with intuition they need to be supported and emphasised with clear and consistent communication.

Overall, the recommendations presented in this chapter amass to a concerted effort to redirect the inherent focus of planners from scenario thinking toward a more rounded and objective view. A single, detailed schedule is an intrinsic requirement in organisational project planning, and in accordance with the empirical findings and the literature on scenario thinking, the generation of such a plan hence needs to be accompanied by the increased salience of potential obstacles to ensure that the inherent tendency to "plan for success" is not exacerbated (Buehler et al., 2003). Furthermore, the empirical failures of alternate scenario manipulations suggest that stronger manipulations are required to mitigate the tendency to plan for success and shift the focus toward potential completion obstacles (Newby-Clark et al., 2000; Byram, 1997).

Debiasing measures therefore need to take this tendency for scenario thinking into account, implying that the inclusion of all relevant considerations in the project schedule is important to help ensure that the generated scenario is more realistic. That is; if there is to be a single, detailed plan, then it should be as realistic as possible. This suggests, for example, that *experience* – providing that it is incorporated into the plan – that unveils planning considerations and possible obstacles to completion could be particularly important in overcoming the potential pitfalls of optimism and overconfidence arising from a single concrete plan.

As discussed in the Research Method chapter, this chapter will also include recommendations for areas that were difficult to establish empirically with the selected

research methods (and hence were not included in the Discussion chapter) although are considered to be very simple yet important measures to help debias predictions in an organisational setting; specifically harmonising the conceptualisation of time and targeting optimism in predictions rather than individuals. These implementations are therefore derived directly from the literature.

The recommendations will first focus upon enhancing the outside perspective through increasing the perceived relevance and availability of distributional information, as well as encouraging and facilitating lateral experience sharing and collaboration. Following this are recommendations to address expert biases. Subsequently, practical recommendations to moderate possible biases arising due to the differences in hierarchical level and from the social context will be discussed. These will include implications for the temporal proximity of prediction generation, which was found to be closely linked with the comprehensiveness of the inside perspective. Finally, there are some brief recommendations for harmonising the conceptualisation of time, including temporal buffers in scheduling, and targeting optimism in predictions rather than in individuals. A brief overview of the recommendations is available in Appendix C.

## 6.1. Enhancing the Outside Perspective

### 6.1.1. Considering One's Own Experience
While there appears to be sufficient emphasis on the use of one's own past experiences in prediction generation, project managers still need to be aware of the potential for attributional biases to reduce the subjective reference class. Furthermore, past planning materials and documentation need to be archived in an electronic database. This would enable project managers to easily access and incorporate accurate and objective historical information and overcome any memory bias that may skew their recollections of past events.

### 6.1.2. Drawing Upon Collective Experience
This recommendation aims to widen the pool of distributional information and lateral support available to project managers. This should help mitigate optimistic prediction by enhancing the outside perspective, as well as inject objectivity into planning through outside-observer influence. This is primarily to address the observation that similarities

between projects are frequent though not always obvious, the *collective* experience of project managers should be utilised to a greater extent to benefit estimation accuracy.

The recommendation here is a knowledge-sharing directory to facilitate knowledge sharing and collaboration between employees. This would be a database of KONE employees and their respective levels of familiarity with various generic aspects of project management. The individuals involved would include project managers and possibly other employees from Global Development, different functions, business units, and front lines. The database would feature a search engine to allow planners to easily locate colleagues with relevant experience.

The emphasis here is on informal, lateral communication to facilitate the sharing of experience, the reduction of information asymmetries and the consequential enrichment of relevant distributional information. This means that rather than comprehensively documenting information perceived as potentially relevant for future planning, the process would work by means of a directory to facilitate more informal communication between KONE employees. This would preferably occur via a phone call or a face-to-face meeting, though perhaps also via a short email.

Verbal and informal communication is recognised as the most preferable means of collaborating for a project manager, owing to the significant cost and efficiency benefits this has over more formal mediums (Kerzner, 2006). Particularly in this context, it is conceivably faster for individuals to be able to identify and convey relevant and valuable past experiences to one another in a more informal setting rather than wading through countless knowledge sharing and best practice documents in the search for something that they will consider to be relevant. As one project manager stated in an interview:

*The more documentation is available, the less likely people are to read it (Interviewee I, 2011).*

Informal and verbal communication enables knowledge sharing and advice to be more tailored to the situation and requirements.

A simple directory should reduce the current dependence on personal networks, by making individuals' key skills and areas of expertise more transparent. The different aspects of project management that can influence the project schedule would be listed at their conceptual level, and directory participants would indicate the degree of familiarity they have with each aspect. Project planners looking to learn about a certain area could then search for and contact individuals with relevant expertise directly.

Additionally, the skills and experiences should be deduced to their higher, more conceptual levels where possible. This should help overcome any focus on superficial differences, show that projects share many essential similarities that may not be visible at the surface level, and hence show that the skills and experiences of others could be significantly transferrable. Listing areas of experience at a more conceptual level should also increase the amount and speed at which information can be found using the search tool. Consequently, informal consultation with an outside source should not only help the project manager access relevant distributional information with optimal efficiency, it should also promote the expansion of the conceivable reference class. The focus on past experiences at a high conceptual level and the neutral input of an outside observer should moderate any attributional biases that might otherwise lead the project manager to disregard such information as irrelevant.

While high-level, conceptual descriptions of experiences and areas of competence are important for expanding the perceived relevance of information and hence the reference class, experiences with environmental factors such as with a specific country, supplier, or individual could also be elaborated upon to give more specific detail. This would enable those using the directory to easily narrow down their search.

The directory therefore consists of individuals' names, contact information, a list of assorted experiential categories, and a search tool. Based on consultation with project managers, the knowledge-sharing directory could include categories such as: Different areas of development (i.e. areas of technical competence), supplier governance, program governance, and experience with specific suppliers, cultures, units, and individuals. The extent of familiarity with each conceptual category would be indicated along with a list of more specific experiences and areas of competence.

When contacted, employees can convey their own personal experiences and advise planners of the potential barriers to completion and areas of particular uncertainty that could arise in their particular circumstances. Further, as discussed in the previous chapter it would be particularly helpful if the advising employee actually looked over the project plan, to possibly identify any missing components or considerations and provide the perspective of a neutral observer. Such consultation with colleagues peripheral to the project implementation should introduce more objectivity as they should not share the motivation for speed in completion or the confidence in the proposed scenario to the same extent as the responsible project manager who is directly involved. This implies that the more extensive the consultation with experienced parties is, the more beneficial it will be for estimation accuracy.

There is also the possibility of logging the information gathered and feeding it back into the knowledge base. This could further enhance the accessibility pool of distributional information and possibly enable best practices to be derived from recurring successes. However, this is perhaps more costly and time consuming so is considered to be an additional step. The core objective would be to enhance network relationships and facilitating connections.

Finally, the introduction of this database would need to be supplemented by the active encouragement of project managers to actually use it. The challenge is not only to enable planners to tap into the experiences of others, it is also in convincing them that the consideration of such experiences is valuable in helping debias their temporal predictions and improving scheduling accuracy.

This is addressed with clear and frequent communication that emphasises the benefits of learning from others and incorporating their experiences into current plans. Because humans are naturally inclined to downplay the relevance of external information in decision-making, strong and consistent communication is necessary to overcome this intuition and encourage project managers to actively seek to learn from the experiences of others. Additionally, the advising 'experts' need to be approachable and enthusiastic about not only communicating their experience, but also in communicating the importance of using experience in planning. This should help reduce the likelihood of

planners listening to the recommendations of others yet still disregarding them when making their own plans. Kerzner (2006) suggests that one of the key attributes of a cohesive informal project management environment is that individuals know their roles and responsibilities. This implies that the knowledge sharing process will run most effectively if the individuals involved understand the importance of sharing such experiences, are open and approachable when contacted, and try to make the time to discuss and consult with others.

## 6.2. Moderating Expert Biases

Two issues need to be addressed to promote accuracy in the prediction of training durations. Firstly, project managers and experts could draw upon the opinions of more intermediate users if they are further removed from the first-user experience. This should moderate the systematic underestimation of the training duration for the mean user. Furthermore, the individual(s) predicting the training schedule need to identify and account for individual differences in ability, the capacity to learn, and openness to change. This way, project resources are not treated as homogeneous and individuals being trained are distinguished from the mean user where appropriate.

Together, these measures should contribute to the mitigation of expert biases through a more realistic conceptualisation of the mean novice user, as well as allowances (i.e. schedule extensions) for deviations from this mean where necessary.

## 6.3. Dealing with Hierarchical Difference

There are several implications for the moderation of optimistic biases induced by the factors associated with hierarchical level. Firstly, existing theory along with the results of this research suggest that the least optimistically biased and hence most accurate temporal predictions should come from the project manager, rather than from the levels above. This is owing to the respective levels of conceptualisation, content knowledge, and experience with relevant subcomponents and environmental variables. As established in the Discussion chapter, such predictions should be most accurate if they involve the consideration of others' past experiences and are reviewed and advised by neutral third parties with relevant knowledge.

Strong trust and frequent and effective communication were identified in the interviews to be the two key things that can enable different levels of hierarchy to work together to minimise the potential effect of hierarchy on scheduling accuracy. A trusting relationship is predicted to lower the likelihood of extensive upper management intervention in scheduling, as well as improve the credibility of their justification when scheduling adjustments are imposed from above.

Most importantly, the justification for intervention must be focused on the means (i.e. feasible reductions in the project's critical path) rather than the end (e.g. the anticipated benefits to be realised after closing the project). Focusing on the anticipated benefits of a project is not a credible rationale for schedule intervention, nor is reasoning that ambitious deadlines should motivate employees or cultivate a more efficient working environment in *every case*. Trust and communication are important to help reveal whether imposing an ambitious deadline can actually speed up work, or whether it will simply result in additional stress and lower employee morale.

As established in the Discussion chapter, decisions to intervene and reduce project schedules should be made based upon an evaluation of the barriers to completion. If these are predominantly internal, then scheduling intervention may be justifiable and could feasibly encourage employees to overcome these. In contrast, if there are relatively more external barriers and greater environmental uncertainty, then greater caution should be exercised by upper management concerning intervention decisions.

In the absence of sufficient justification (i.e. if completion barriers are primarily external and hence instilling ambitious deadlines can not be credibly expected to reduce the project's critical path), upper management should entrust scheduling decisions primarily to the project manager, whilst removing any tangible or intangible organisational pressures; for example by moderating the implicit emphasis on speed in completion and balancing planning priorities with additional encouragement for prediction accuracy. As established by these results and the existing literature, the project manager's temporal predictions should typically be less biased than those imposed or revised from above.

Additionally, the contract approval process needs to ensure that project managers have a strong involvement in supplier evaluation and an influence in the final decision. Because the project manager is more likely to include historical, peripheral, and more detailed information in their evaluation, this should help ensure that the approved suppliers have more realistic plans.

In summary, upper management need to acknowledge that temporal estimates are simply predictions of the future surrounded by a degree of uncertainty rather than a concrete description of how the future will actually manifest. A project schedule does not determine the future outcome (although as discussed it can somewhat influence completion behaviour in some instances), it merely tries to predict it. Management need to recognise that any belief to the contrary in the absence of clear justification is essentially fallacious, and indicative of Langer's (1975) illusion of control.

This means that in practice, greater trust and responsibility for temporal estimation should be assigned to the project manager where possible. Furthermore, since project managers are expected to accumulate experience throughout the course of a project phase, increasing emphasis and trust should be placed upon their later predictions as the phase progresses (e.g. predictions of later rollout durations); providing that these are based soundly upon their earlier experiences. Moreover, excessive reductions in schedules and overly ambitious deadlines merely serve to increase stress and lower morale in organisational projects, rather than generate enthusiasm. Accordingly, justification for upper management intervention must be clearly and objectively reasoned and communicated to the project team to promote a mutual trusting relationship.

## 6.4. Moderating the Social Influence

The results revealed that high-level project deadlines were often established in meetings such as the rollout kick-off meeting. Consistent with planning fallacy theory, this research posits that such meetings can exacerbate optimism in temporal prediction due to an array of bias-inducing factors. Accordingly, in the interest of prediction accuracy it is preferable that the generation and freezing of deadlines in such social contexts should be avoided. However, as established in the Discussion chapter, this is not always

practically feasible, and it is often desirable to set clear deadlines upon the commencement of a project phase. Group consultation is necessary and unavoidable for projects that involve input from different functions and units. This means that the social context must be managed to moderate the impact of excessive positivity that can prevail in a collaborative environment.

When the circumstances necessitate the establishment of high-level deadlines in a group setting, those involved in the schedule formulation need to at least be aware of the tendencies to plan for success, oversimplify the project, and neglect important distributional information associated with group predictions. The adoption of the third person perspective should be promoted, along with the possible inclusion of individuals that have differing motivations regarding the speed of completion. Moreover, increased responsibility for predicting the duration of project subcomponents should be assigned to the individuals that have the most complete knowledge of each subcomponent. Practically this means placing more emphasis on predictions made by the project manager and project team compared to those suggested by higher levels.

Finally, honesty and apprehension about ambitions schedules should me openly encouraged rather than seen as uncooperative or pessimistic. The social environment in organisations naturally suppresses scepticism and intensifies positivity and optimism, and this must be acknowledged when predictions are made to inject greater objectivity and remove the schedule from the best-case scenario.

## 6.5. Considering Temporal Proximity

Implications can also be derived for the appropriate temporal proximities of setting and revising deadlines. Consistent with temporal proximity theory and CLT, this research found that predictions formulated with closer temporal proximity tended to be far more accurate, owing to the more complete inside view adopted. Less temporal distance means that project-specific information and possible barriers to completion are more obvious and available, better understood by planners (i.e. the scope is more clearly established), and more focal, meaning that they are more likely to be integrated into the plan. This enables the project subcomponents to be more comprehensively identified

and unpacked, resulting in the generation of a relatively longer and hence less biased schedule.

As established in this discussion, project managers often perceive an inclination for higher levels of management to set deadlines early and revise them late. This has implications for the propensity for optimistic biases to permeate the scheduling, and the benefits of such practices must be weighed up against the possible drawbacks for planning accuracy to help ensure that scheduling intervention is suitable for the circumstance.

Managing temporal proximity in practice involves consideration of the most appropriate time to establish deadlines with respect to temporal distance and the clarity of the project scope. In a rollout, this means that it should be preferable to freeze the deadlines after the scope has been clearly established via a thorough gap analysis. As one project manager put it:

*"I think that we should hold off fixing the project end date until we have done the full gap analysis, and that's something we don't do yet." (Interviewee VIII, 2011)*

Moreover, the schedule should be continually revised and updated throughout a project's lifecycle where feasible, since the less distance there is in schedule revision, the more possible completion obstacles are likely to be identified and considered. When such revisions are made, planners should be encouraged to disregard their previous (under)estimations and generate new temporal predictions. This should help moderate any tendency to anchor on and (insufficiently) adjust from prior deadlines.

Overall, considering temporal proximity entails striving for a suitable balance between two opposing forces. On one hand there is the desire to establish clear deadlines early on to build commitment and direction. On the other, there is the notion that prediction accuracy benefits can be derived from waiting until the project scope is clearer and competing time demands and completion barriers are more focal before freezing project deadlines. Moreover, the desire to uphold ambitious deadlines to maintain consistent direction needs to be balanced with measures to revise clearly unattainable timeframes, particularly since impossible deadlines inevitably serve to demotivate and inflict stress

on the project team. If project managers and upper management are aware of these tradeoffs, it should be easier for them to manage the temporal proximity of time predictions appropriately.

## 6.6. Manipulating Subjective Temporal Proximity

While information regarding subjective temporal proximity and the prevailing means of temporal framing within KONE Corporation was difficult to obtain from semi-structured interviews (and consequently did not feature in the Results chapter), there are simple practical implications that can harmonise the cognitive approaches to temporal framing within an organisation.

Management can easily manipulate the subjective temporal distances perceived by project managers to subtly moderate optimism in temporal prediction. Practically, this involves the use of language in meetings, training materials and other documentation that promotes negative temporal framing (Sanna et al., 2005) and the adoption of the time motion perspective (Boltz and Yum, 2010) to encourage planners to see the future as more urgent and impending, thereby inducing more conservative temporal estimates. Harmonising the conceptualisation of time across the portfolio should help improve temporal planning accuracy overall.

The link between temporal framing and the anchoring and adjustment process implies that these measures should also reduce the potential effect of anchoring and adjustment on optimistic prediction bias (Buehler et al., 2010b; Epley and Gilovich (2001, 2004, 2005, 2006; LeBoeuf and Shafir, 2009; Sanna et al., 2005). While anchoring and adjustment processes were also difficult to identify owing to the nature of data collection, the recommendations made here could also indirectly address any biases induced by this mode of prediction. By using linguistic terms that imply a sense of urgency and impending deadlines as well as encouraging a more realistic range of feasibility via the other recommendations discussed in this chapter, Global Development could help minimise the possibility of biases permeating the schedule due to the anchoring and adjustment process.

## 6.7. Time Buffering

To ensure appropriate use of reasoning in accordance with the laws of probability, project managers and upper management need to acknowledge that the probability of at least one of obstacle to completion within all possible obstacles being realized is substantially greater than the probability of a selected individual obstacle occurring. Accounting for this in practice entails that allowance for some buffer in scheduling, the size of which should increase in relation to the degree of uncertainty (i.e. the number of possible completion barriers, and the likelihood of at least one of them occurring). The presence of a time buffer helps prevent the schedule representing the best-case future scenario and indicates the acknowledgement that every single thing does not necessarily fall into place in open-task project execution.

At present there is no official practice for the inclusion of temporal buffers in KONE Way project planning. Instilling a homogeneous policy regarding this could help ensure the universal appreciation of correct probabilistic reasoning, as well as more consistency in communication and greater harmonization with generic project management practices that project managers learn when getting their certification.

## 6.8. Targeting Optimism in Predictions Rather than in Individuals

A final consideration is where the emphasis should be placed in attempting to debias temporal prediction in an organisation. The notion that dispositional optimism and positivity about the future appear to be essential for an individual's psychological well-being presents a complication for organisations trying to reign in optimism and increase accuracy in temporal planning (Taylor and Brown, 1988). Debiasing techniques need to be constructed carefully to ensure they target the resulting underestimation without extinguishing the underlying positive illusions that contribute to them, since these cognitions appear to be intrinsic to stable mental health. In approaching this problem, organisations therefore need to make a clear distinction between discouraging dispositional optimism and debiasing optimistic predictions.

Individuals should be encouraged to utilise their intrinsic motivation, energy and natural tenacity, yet keep these removed from their predictions (e.g. via manipulations and motivations), thereby injecting a higher degree of objectivity into forecasts. Complex

organisational projects are also generally subject to factors that are beyond the control of the planning individual's best intentions and efforts (Buehler and Griffin, 2003). Thus, management needs ensure that debiasing measures target optimistic biases in the predictions themselves rather than in the individuals making them (Buehler and Griffin, 2003; Taylor and Brown, 1988).

# 7. Conclusions and Suggestions for Future Research

This research has applied the rich body of existing literature to successfully identify a number of prominent cognitive, motivational and contextual factors as influential with respect to optimistic bias in internal project planning in the MNC context. Moreover, it has identified the respective prevalence of different bias-inducing attributes at different levels of organisational hierarchy, as well as presented various practical recommendations to appropriately address the identified areas of concern.

This research also provides a starting point for further investigation into optimistic prediction bias in the empirical context. As previously acknowledged, the methodology adopted in this research relied heavily on qualitative interviewing, which proved to be more appropriate for identifying and examining some contributing variables over others. The research performed here using KONE Corporation as a case example could be expanded upon considerably, and there should be a multitude of variables exacerbating optimistic prediction bias and perpetuating the planning fallacy within organisations that are yet to be identified.

Hence, future research could entail the adoption of alternate research methodologies to help deconstruct the myriad of optimistic bias components that prevail in the empirical world. Useful examples include longitudinal observation, ethnography and more extensive quantitative analysis. Theses could help shed more light on biases not readily identified within this research; for example the anchoring and adjustment process and possibly how this interacts with temporal proximity, as well as how organisational motivations can influence the more subtle bias-inducing factors such as the conceptualisation and framing of time.

Another possible area of interest in organisational planning is the possible anchoring on calendar dates. Interviewees in this research often communicated an implicit desire to accomplish things "before Christmas" or "before the summer". In contrast with LeBoeuf and Shafir's (2009) findings, this suggests that a disproportionate level of significance could be placed on particular calendar dates in practice, and that these more

prominent dates could serve as anchors upon which predictions could be based (perhaps with some adjustment). The interviews in this research indicated that a disproportionate emphasis could be placed on prominent holidays such as Christmas, Easter, or New Year's, as well as periodic intervals used for other organisation purposes, such as annual budgeting or quarterly reviews.

Additionally, while this research focused primarily upon individual differences with respect to hierarchical position, various other differences prevail within the organisation. For example, the interviews conducted in this work, along with notions arising in various preceding academic works (e.g. Hinds, 1999) suggest that the thought processes in planning and collaboration could differ between individuals with different levels of project management experience/expertise. Hence, an interesting avenue for future research could aim to establish the existence of a relationship (positive or negative) between the relative experience/expertise of project managers and their propensity to share and collaborate with others, along with the extent to which they value the use of distributional information (particularly from others' projects or experiences) in temporal prediction generation. Developing a deeper understanding here using cognitive bias and motivational frameworks could yield significant benefits for organisations with respect to training, knowledge sharing and collaboration efforts, in addition to improvements in temporal planning accuracy.

Moreover, a longitudinal study evaluating the empirical success of applied debiasing techniques could also be useful for honing the practical recommendations and improving organisational project planning methodologies. In practice, there appears to be a large scope for the further consideration and attempted mitigation of optimistic prediction bias in prevalent project scheduling methodology.

In sum, the investigation into the various facets of organisational project planning that could pertain to optimistic prediction bias in scheduling is a very broad and relatively novel research area, and one that could in future yield considerable economic benefits for companies at a fraction of the cost.

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# 9. Appendices

## 9.1. Appendix A: Thesis Diary – Optimistic Prediction Bias in Practice

This thesis diary is attached as an appendix to accompany the academic work and provide the reader with some optional insight into the actual writing process. It will describe the thesis writing process from the author's perspective to help exemplify the fallibility of human cognition, and demonstrate that even those among us that are conscious and cautious of optimistic prediction bias are still vulnerable to its grasp. While this real life illustration should be readily accessible for those uninitiated to optimistic bias, some of the concepts alluded to will become clearer after reading the thesis itself. It is structured sequentially, covering the process from beginning to end.

**The Idea**

The idea for this research arose as an epiphany on a train travelling across Italy. I had been in transit for more than twenty-two hours, at least fifteen longer than I had initially planned. I had intended to depart Helsinki for Rome at 6:40am CET Saturday morning, boarding a train from Rome to reach my final destination, Serra San Quirico, sometime around 1pm. Instead, I missed the flight in the morning owing to the "brief nap" I took upon arriving home at 4am after attending Flow Festival the night before, intending to wake up at 4:30am. I awoke at 9:30am.

This lead to a desperate scramble for alternate flights, resulting in a seven hour stopover in Stockholm, a midnight flight to Italy, followed by a four hour "walking tour" through Rome with a gentleman I met on the plane whilst I waited for the first train at 6am Sunday. Incredibly tired, although pleased to be reaching the destination, I couldn't help but reflect upon my innate tendency for excessive optimism when predicting future outcomes (i.e. that I could actually awake from a half-hour sleep at 4:30am).

This is not a true example of the planning fallacy per se. I hadn't done this in the past so there were no concrete past examples to draw from. Perhaps this represented an overestimation of my abilities rather than temporal underestimation, and one could also credibly argue that this example was induced by pure stupidity and inebriation rather

than cognitive bias. Still, the experience induced me to contemplate the generality of excessive optimism in future prediction; which from both anecdotal evidence and my few months experience in portfolio management was prevalent in many different forms.

I saw an opportunity to address the issue of optimistic bias with respect to time prediction in project management at KONE Corporation. The project planning methodology within KONE had been rigorously developed over the preceding few years, although to my knowledge it did not incorporate the notion of cognitive biases. Temporal underestimation appeared to persist despite management and the Program Management Office's (PMO) attempts to yield more detailed (and thus intuitively more "accurate") planning. "Surely", I thought, "these same cognitive biases that encourage us to envisage such rosy and simple future outcomes should play a role in this prevailing inaccuracy?"

I researched the phenomenon of time underestimation, finding the 'planning fallacy' explanation to be the most widely accepted and relevant in this instance. I made the research proposal to KONE, who accepted near the end of December 2010, allowing me to commence the research in January 2011. I intended to complete the master's thesis in August 2011 by the latest. I was tentative about forecasting a concrete completion date, and inferred a completion time period that was further in advance of what I felt I might need; i.e. a "worst case" scenario. This was for obvious reasons – the nature of my study meant that any failure to complete my master's thesis within the time period I predicted would not only be ironic but embarrassing.

**Commencing the Research**

I initially intended to commence my detailed research into the literature in January when the first unexpected external interruption quickly reared its head. I was in Brisbane, Australia between November 2010 and February 2011 to visit friends and family and begin researching for my master's thesis. I spent Monday 10th January in the library, commencing what would be an extensive investigation into the psychological and business literature concerning the planning fallacy phenomenon.

Starting Tuesday 11th January, Brisbane experienced the biggest flood in four decades, bringing 'everyday life' to a virtual standstill. Much of the following three weeks was

spent helping friends and neighbours who were affected by the flood: cleaning, deconstructing and rebuilding houses, salvaging what could be saved and trashing the remainder. This left precious little time for reviewing literature, leaving me three weeks behind 'schedule' from the outset.

**The Writing Process**

I returned to Helsinki on the 9th February, more than a week later than I had originally anticipated to allow me to help those in need as best I could before my obligations in Finland became too pressing. This is where the review of previous research and the writing of my literature review really got underway. After meeting with my boss at KONE on the 11th February, I proposed a completion time for the literature review "somewhere in early March". At the time I was genuinely confident that this was a fairly accurate estimation, based on the prediction that I could spend at least five days a week only on this. However, I failed to incorporate competing demands for my time: friends that I hadn't seen in three months wanted to catch up, the practicalities of everyday life warranted attention, and I was also obliged to attend thesis seminars. While these seminars were undoubtedly beneficial for the research process, I still had to spend time preparing for them (for instance developing a research plan to present to others and reviewing others' work to provide questions and suggestions); time that I hadn't budgeted for in my estimation of when my literature review would be complete.

Additionally, on March 14th I commenced a business research methods course. This is also inherently beneficial to my thesis work, although it introduces competing time demands that were not focal at the time of my prediction in February. Consequently, while still spending optimal time constructing the literature review and balancing the competing demands of the course, seminars, and a mentally healthy lifestyle, I watched my self-imposed deadlines slowly slip away.

Upon completing the Literature Review in April, I began to finalise the research method and prepare for the interviews. Since the majority of these were to be conducted in Brussels, I needed to organise a week in advance where all interviewees would be available. While this proved reasonably simple, the arranged week was still a week or two later than I had hoped, broadly illustrating the correlation between the number of

people involved in coordination and the planning complexity. This meant that it was the end of May before I had compiled all of the research data.

Writing the Results, Discussion, Recommendations, and Conclusions and Suggestions for Future Research went reasonably smoothly. With classes over, I just had a beautiful Finnish summer to contend with, and was able to complete the draft text in early August – well in advance of my final deadline. The only thing remaining was to revise and edit the text – something I then realised I had trivialised substantially.

**Wrapping Up**

Wrapping up the thesis work coincided with me wrapping up my life in Helsinki for the time being; I was moving to India for an exchange semester at the Indian Institute of Management Ahmedabad (IIMA). Included in this was a 'bonus' twelve days in Brisbane from the 23rd August until the 3rd September that arose due to the need to use a flexible return ticket that would have otherwise expired before I left India.

It was upon commencing the editing in the final days of Helsinki – once preparations were in order and the possessions that I had decided to keep were accounted for – that I realised I had misjudged the depth of this 'peripheral' task. It became apparent that when I had previously broken the thesis into subcomponents, I had focused overwhelmingly on the predetermined chapters and set reasonable deadlines for each of these. This meant that the editing and revision process did not feature strongly in this plan, and was hence essentially conceptualised at a very high level. Not surprisingly then, this was the very task that took longer than anticipated.

I had printed the latest version of the text, and intended to do a lot of editing on the journey back to Brisbane. However, a moment of dietary complacency and misunderstanding at Copenhagen airport lead to my plans being ruined by a mouthful of satay stir-fry. With my peanut allergy inflamed and my motivation shot to pieces, I spent the next few hours in a particularly uncomfortable state and was too tired on the subsequent flights (London to Seoul to Brisbane) to bring myself to do anything substantially productive.

I was able to do some work from Brisbane in between frantically catching up with friends and family, and was planning to complete the revision process on the flights to Ahmedabad when yet another unforseen external interruption arose: Bad weather in Mumbai kept our flight from leaving Singapore for three days (an opportune and cost-effective way to see the city; providing that the airline is willing to pay for passengers' accommodation and meals).

After finally arriving in Ahmedabad, I spent the following week embracing the initial culture shock and disorientation, obligatory sickness, and cumbersome administrative procedures. Thereafter, a few sessions in the library were sufficient to bring the completion the thesis to the status of a "closed task"; i.e. one that could be completed in a single session. Providing exemplary support for Buehler, Peetz, and Griffin's (2010b) findings, the task's transition from open to closed increased my motivation for completion exponentially, and I resolved to lock down in IIMA's 24 hour library until it was completed in its entirety. The final product was done and dusted two weeks after my self-imposed final deadline. And thankfully, the encouragement and congratulations from my peers more or less overshadowed their latent desire to point out the implicit irony in my own planning failures.

**Learning for the Future**

In sum, my personal experiences have reaffirmed that human cognition is fallible, and optimistic prediction biases are firmly entrenched in our natural though processes. It takes a conscious effort and committed vigilance to identify and overcome the tendency to overlook peripheral details, simplify and trivialise the future, and actively incorporate past experiences (one's own and those of others) into present prediction. Even so, I think I'm improving with this…

## 9.2. Appendix B: Comparative Analysis of Rollout Durations – Past, Ongoing and Future

**Mean Analysis**

| Project | Past Mean (P) | Ongoing Mean (O) | P&O Mean (Weighted) | Future Mean (F) | P/F | F/P | P&O/F | F/P&O |
|---------|---------------|------------------|---------------------|-----------------|-------|-------|-------|-------|
| A | 8.429 | 5.5 | 7.778 | 3.5 | 2.408 | 0.415 | 2.222 | 0.45 |
| B | 8.1 | 7.75 | 8.294 | 3.875 | 2.090 | 0.478 | 2.140 | 0.467 |
| C | 8.143 | 9 | 8.4 | 5.118 | 1.591 | 0.628 | 1.641 | 0.609 |
| D | 4.75 | 4.5 | 4.667 | 3.769 | 1.260 | 0.794 | 1.238 | 0.808 |
| E | 7 | 17 | 12 | 6.2 | 1.129 | 0.886 | 1.935 | 0.517 |
| F | | 6.75 | 6.75 | 4.4 | | | 1.534 | 0.652 |
| G | 12 | 15.333 | 13.667 | 9.667 | 1.241 | 0.806 | 1.414 | 0.707 |
| H | 8.571 | 4.333 | 6.615 | 7.765 | 1.103 | 0.906 | 0.852 | 1.174 |
| I | 12.5 | 15.267 | 14.684 | 9.333 | 1.339 | 0.747 | 1.573 | 0.636 |
| J | 6.222 | 16.333 | 12 | 4 | 1.556 | 0.643 | 3 | 0.333 |

**Using Means:**

|  | As Ratio | As Percentage |
|---|---|---|
| Mean P:F Ratio | 1.524 | 152.43% |
| Mean F:P Ratio | 0.700 | 70.03% |
| Mean P&O:F Ratio | 1.755 | 175.51% |
| Mean F:P&O Ratio | 0.635 | 63.53% |

| | |
|---|---|
| Actual duration exceeds anticipated future duration by: | 52.43% |
| Anticipated future duration is shorter than past duration by: | 29.97% |
| Past and ongoing durations exceed anticipated future durations by: | 75.51% |
| Anticipated future duration is shorter than past and ongoing durations by: | 36.47% |

**Median Analysis**

| Project | Past Median (P) | Ongoing Median (O) | P&O Median (average) | Future Median (F) | P/F | F/P | P&O/F | F/P&O |
|---|---|---|---|---|---|---|---|---|
| A | 7 | 5.5 | 6.25 | 3 | 2.333 | 0.429 | 2.083 | 0.48 |
| B | 8 | 8 | 8 | 4.5 | 1.778 | 0.563 | 1.778 | 0.563 |
| C | 6 | 7 | 6.5 | 4 | 1.5 | 0.667 | 1.625 | 0.615 |
| D | 4 | 4.5 | 4.25 | 4 | 1 | 1 | 1.063 | 0.941 |
| E | 7 | 15 | 11 | 6 | 1.167 | 0.857 | 1.833 | 0.545 |
| F | | 6.5 | 6.5 | 5 | | | 1.3 | 0.769 |
| G | 10.5 | 15.5 | 13 | 9 | 1.167 | 0.857 | 1.444 | 0.692 |
| H | 10 | 4 | 7 | 6 | 1.667 | 0.6 | 1.167 | 0.857 |
| I | 13.5 | 18 | 15.75 | 9 | 1.5 | 0.667 | 1.75 | 0.571 |
| J | 6 | 17 | 11.5 | 4 | 1.5 | 0.667 | 2.875 | 0.348 |

**Using Medians:**

|                          | As Ratio | As Percentage |
|--------------------------|----------|---------------|
| Mean P:F Median Ratio    | 1.512    | 151.23%       |
| Mean F:P Median Ratio    | 0.701    | 70.06%        |
| Mean P&O:F Median Ratio  | 1.692    | 169.18%       |
| Mean F:P&O Median Ratio  | 0.638    | 63.82%        |

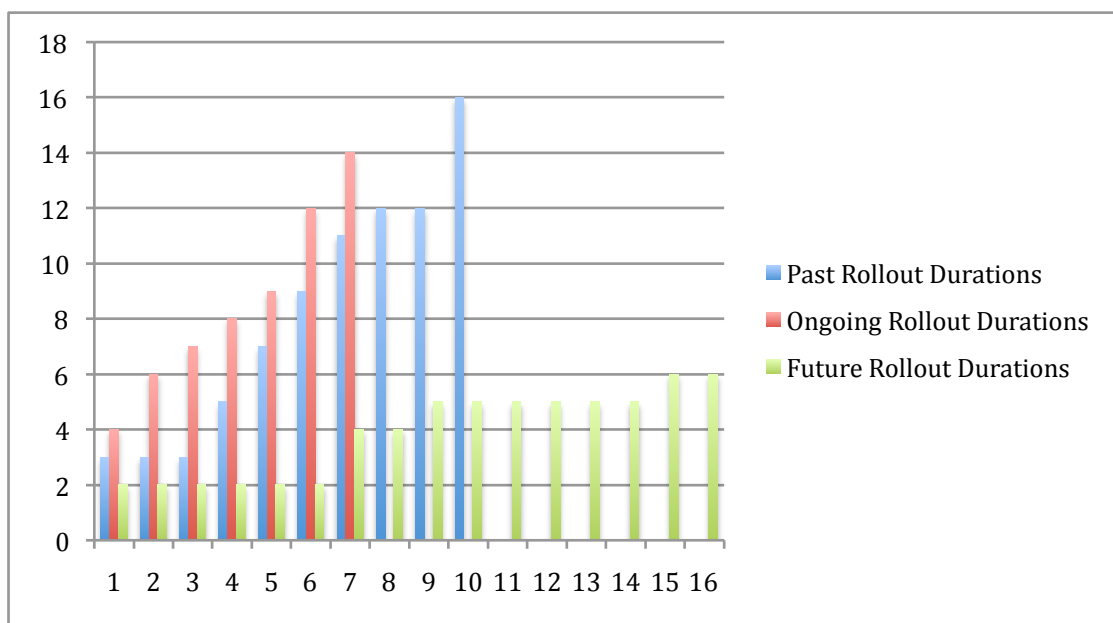| | |
|---|---|
| Actual duration exceeds anticipated future duration by: | 51.23% |
| Anticipated future duration is shorter than past duration by: | 29.94% |
| Past and ongoing durations exceed anticipated future durations by: | 69.18% |
| Anticipated future duration is shorter than past and ongoing durations by: | 36.18% |

**Project A**

| Past Rollout Durations | Ongoing Rollout Durations | Future Rollout Durations |
|---|---|---|
| 4 | 4 | 3 |
| 5 | 7 | 3 |
| 5 | | 3 |
| 7 | | 3 |
| 8 | | 3 |
| 14 | | 6 |
| 16 | | |
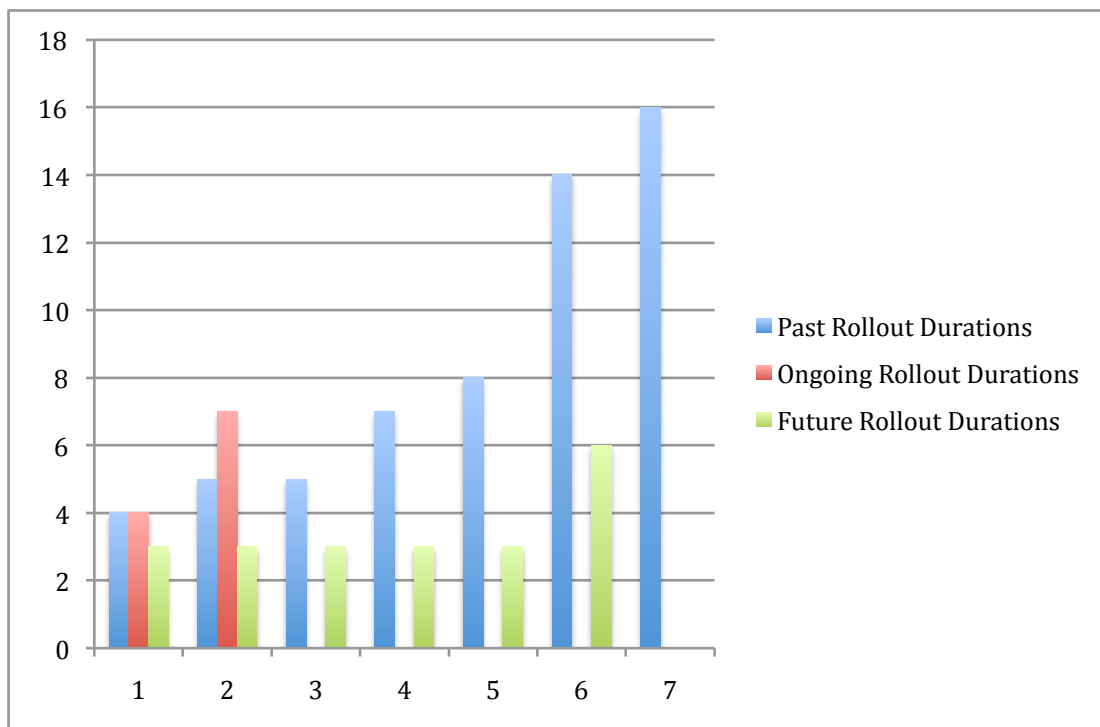
**Project B**

| Past Rollout Durations | Ongoing Rollout Durations | Future Rollout Durations |
|---:|---:|---:|
| 3 | 4 | 2 |
| 3 | 6 | 2 |
| 3 | 7 | 2 |
| 5 | 8 | 2 |
| 7 | 9 | 2 |
| 9 | 12 | 2 |
| 11 | 14 | 4 |
| 12 | | 4 |
| 12 | | 5 |
| 16 | | 5 |
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| | | 6 |
| | | 6 |

**Project C**

| Past Rollout Durations | Ongoing Rollout Durations | Future Rollout Durations |
|---|---|---|
| 5 | 7 | 3 |
| 5 | 7 | 3 |
| 6 | 13 | 3 |
| 6 | | 4 |
| 10 | | 4 |
| 10 | | 4 |
| 15 | | 4 |
| | | 4 |
| | | 4 |
| | | 5 |
| | | 5 |
| | | 6 |
| | | 7 |
| | | 7 |
| | | 7 |
| | | 8 |
| | | 9 |

**Project D**

| Past Rollout Durations | Ongoing Rollout Durations | Future Rollout Durations |
|---|---|---|
| 4 | 4 | 3 |
| 4 | 5 | 3 |
| 4 | | 3 |
| 7 | | 3 |
| | | 3 |
| | | 3 |
| | | 4 |
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| | | 4 |
| | | 5 |
| | | 5 |

**Project E**

| Past Rollout Durations | Ongoing Rollout Durations | Future Rollout Durations |
|---:|---:|---:|
| 7 | 15 | 5 |
| 7 | 15 | 6 |
| 7 | 21 | 6 |
|  |  | 6 |
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|  |  | 9 |

## Project F

| Past Rollout Durations | Ongoing Rollout Durations | Future Rollout Durations |
|---|---|---|
| | 4 | 2 |
| | 5 | 3 |
| | 8 | 3 |
| | 10 | 4 |
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**Project G**

| Past Rollout Durations | Ongoing Rollout Durations | Future Rollout Durations |
|---|---|---|
| 9 | 12 | 8 |
| 9 | 12 | 9 |
| 9 | 15 | 12 |
| 12 | 16 | |
| 14 | 18 | |
| 19 | 19 | |
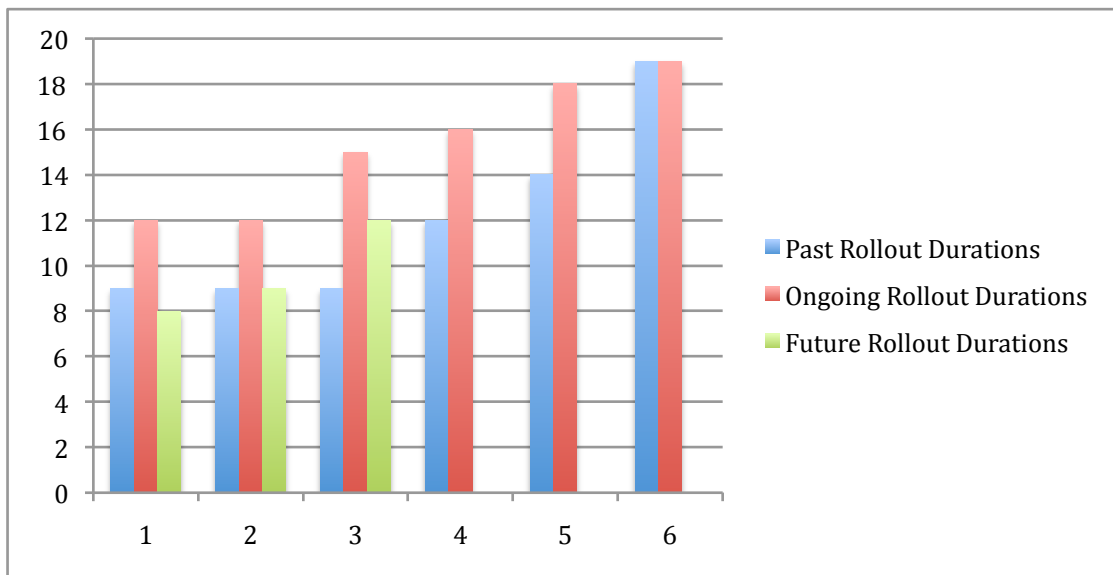
**Project H**

| Past Rollout Durations | Ongoing Rollout Durations | Future Rollout Durations |
|---:|---:|---:|
| 3 | 3 | 3 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 10 | 4 | 4 |
| 11 | 6 | 4 |
| 13 | 6 | 6 |
| 16 | | 6 |
| | | 6 |
| | | 6 |
| | | 9 |
| | | 9 |
| | | 12 |
| | | 12 |
| | | 12 |
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## Project I

| Past Rollout Durations | Ongoing Rollout Durations | Future Rollout Durations |
|---:|---:|---:|
| 7 | 8 | 9 |
| 13 | 8 | 9 |
| 14 | 10 | 10 |
| 16 | 10 | |
| | 10 | |
| | 13 | |
| | 16 | |
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| | 18 | |
| | 19 | |
| | 19 | |
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| | 21 | |
| | 21 | |

## Project J

| Past Rollout Durations | Ongoing Rollout Durations | Future Rollout Durations |
|---:|---:|---:|
| 5 | 9 | 4 |
| 5 | 17 | 4 |
| 6 | 17 | 4 |
| 6 | 17 | 4 |
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| 10 | 17 | 4 |
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## 9.3. Appendix C: Recommendations in Brief

- Expand the perceived and available reference class by emphasizing conceptual similarities between projects and archiving past project planning data.
- Develop an Experience-sharing directory database to facilitate intra-organisational networking.
- Manage expert biases through consultation with intermediate users and consideration of individual differences.
- Acknowledge the relationship between susceptibility to optimistic bias and level of hierarchy (power). Assign greater trust and responsibility for scheduling to the project manager.
- Base schedule intervention decisions primarily on the status of barriers to completion (i.e. external vs. internal). Evaluation of these is best facilitated through trust and communication.
- Greater project manager involvement and influence in the supplier evaluation and contract approval process.
- Manage the temporal proximity of deadline setting to ensure that the inside perspective is sufficiently comprehensive (i.e. the scope is clear enough and the project can be unpacked).
- Manage the social environment in which predictions are made to moderate excessive positivity.
- Influence subjective temporal proximity with the use of language in meetings and documentation.
- Uniform practices for the inclusion of a time buffer in scheduling, increasing with the level of uncertainty.
- Target optimism in predictions rather than in individuals