

TEAMWORK FOR PRODUCT INNOVATION IN TAIWANESE FAMILY

FIRMS:

AN INDIGENOUS PSYCHOLOGY PERSPECTIVE

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Teamwork for product innovation in Taiwanese family firms:

An indigenous psychology perspective

Min-Wen. Sophie Chang

Summary

As the existing team literature mostly excludes context and culture, little is known about how these elements affect real-life teamworking (Engestrom, 2008; Salas & Wildman, 2009), and how teams work in non-Western settings, such as in Chinese firms (Phan, Zhou, & Abrahamson, 2010). This research addresses this issue by investigating how new product design (NPD) teams use teamworking to carry out product innovation in the context of Chinese family businesses (CFBs) via an indigenous psychology perspective. Unlike mainstream teamwork literature which mostly employs an etic design, an indigenous psychology perspective adopts an emic approach which places emphasis on understanding real-life phenomena in context through a cultural-insider perspective (Kim, 2000). Compatible with this theoretical position, a multiple qualitative case study approach was used as the research methodology. Three qualitative case studies were carried out in three longstanding family-run manufacturing firms in Taiwan, where family firms have been the pillars of high economic growth in the past five decades (W.-w. Chu, 2009).

Two salient findings were established across the three case studies. First, the team processes identified across the three family firms are very similar with the exception of owners' involvement and on-the-job training. All three family firms' NPD teams are managed in a highly hierarchical manner, with considerable emphasis placed on hierarchical ranking, cost-effectiveness, efficiency, practicability, and interpersonal harmony. Second, new products developed by CFB NPD teams are mostly incremental innovation or copycat innovation, while radical or original products are rare. In many ways, CFB NPD teams may not be the ideal incubators for innovation. This is because several aspects of their unique context can cast constraints on how they work and innovate, and thus limit the ratio of radical innovation. A multi-level review into the facilitators and inhibitors of creativity or innovation in CFB NPD teams is provided. The theoretical and practical implications of the findings and the limitations of the study are also addressed.

Key words: Chinese family businesses (CFBs), context, creativity, product innovation, teamwork.

Dedication

I dedicate this thesis to my family: my parents and my two brothers. Without their support, this research would not be possible.

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Chapter 1 Introduction

1.1 Research Background

As a crucial factor in corporate success, competitiveness and profitability, innovation has become a popular topic for both practitioners and researchers (Porter, 2004; Un, 2010). For example, manufacturers have to embrace advanced technology and product innovation in order to create attractive and profitable new products to keep up with fierce global competition (J. Zhang & Duan, 2010). On another front, researchers are also keen to uncover the key to successful innovation and to provide sensible guidance (Folkestad & Gonzalez, 2010).

Innovation has become synonymous with change (Cobbenhagen, 2000) because being innovative broadly means taking on something new such as adopting new practices, generating creative ideas, or transforming knowledge and new ideas into new services, processes or products (Amabile, 1996; Harvard Business School, 2003). West and Farr (1990) gave a more elaborate definition of innovation as 'the intentional introduction and application within a role, group or organisation of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organisation or wider society' (p.9).

In reality, innovation usually requires more than just changing the ways of doing things, coming up with new ideas or implementing novel ideas - it can be complex, multidimensional and challenging. Given the complex and heterogeneous nature of innovation, researchers in different disciplines compete to offer theories of organisational innovation and creativity. For

example, from an economics perspective, researchers have compared various national innovation systems or the overall innovative competence of different nations (Oh, Park, & Park, 2003; Porter, 2004) and how different national policies promote innovation across countries (Hou & Lee, 1993; Shyu & Chiu, 2002). Furthermore, knowledge management researchers have suggested that how knowledge is stored, shared, or 'diffused' in teams and organisations is the key for successful innovation (e.g. Davenport & Prusak, 1998; Despres & Chauvel, 1999; Fischer, 2001; Hansen, Nohira, & Tierney, 1999; Howell, 2004; Nonaka, 1991; Von Krogh, Ichijo, & Nonaka, 2000). Other approaches focus on the processes of innovation (e.g. Poole, Van de Ven, Dooley, & Holmes, 2000; Rogers, 1995) or the influence of leadership on innovation (e.g. Kodama, 2005; Krause, 2004; Mumford & Licuanan, 2004; West et al., 2003).

Besides these theoretical approaches, researchers have also looked into innovation in teams and teamwork for innovation, mainly in Western contexts (e.g. Agrell & Gustafson, 1996; Anderson, Hardy, & West, 1990; West, 2003). Teams that are defined as 'a small number of people with complementary skills, who are committed to a common purpose, set of performance goals, and approach for which they hold themselves mutually accountable' have important roles in modern organisations (Katzenbach & Smith, 1993, p.113). Nowadays, teams or groups are often considered as 'building blocks' (Nijstad & De Dreu, 2002; Sundstrom, De Meuse, & Futrell, 1990), or as 'bridges' which connect organisations and the individuals who work within them (Gladstein, 1984). Besides being the basic units of organisations, teams are used extensively to carry out innovation in organisations, such as developing new products (Conway & Forrester, 1999;

Gebert, Boerner, & Kearney, 2006), and other types of long-term projects (e.g. quality control groups) and one-off tasks.

So far, researchers have explored various aspects of teamwork in relation to innovation and creativity, such as overall teamwork patterns for innovation, the role of creativity in teams and the effects of diversity in teams. In terms of overall models of teamwork for innovation, a few simple input-process-output (I-P-O) models of team innovation have been posited (e.g. West & Anderson, 1996; West, Borrill, & Unsworth, 1998; West & Hirst, 2003). In these classical I-P-O models, innovation in teams is conceptualised as a result of input factors (e.g. team members' knowledge and expertise) being transformed into outputs via team processes (e.g. communication, leadership and decision-making). In addition to classical I-P-O models, which portray team innovation as a simple linear process, there are also more complex, non-linear sequential models. For instance, Markus, Mathieu and Zaccaro (2001) proposed a temporal model to explain teamwork for innovation as a series of multiple I-P-O episodes occurring during different task achievement phases. In another study, Ilgen, Hollenbeck, Johnson and Jundt's (2005) proposed an input-mediator-output-input (IMOI) framework to describe teamworking as a series of continual cycles rather than a one-off linear event.

In addition to overall teamwork patterns, another stream of team research focuses on creativity in teams. Creativity, which can be defined as 'the production of novel, appropriate ideas in any realm of human activity', is indispensable for team innovation (Amabile, 1997, p.40). This is because team innovation generally starts with the creation of creative ideas and ends with their facilitation (West, 2002a). Researchers have found many factors

that facilitate creativity in teams, such as trust (Barczak, Lassk, & Mulki, 2010), supportive leadership (Amabile, Schatzel, Moneta, & Kramer, 2004; Costigan et al., 2006), team cohesiveness (Craig & Kelly, 1999), and high levels of collaboration (Hoegl & Parboteeah, 2007).

Moreover, besides creativity, researchers have examined the effects of diversity and communication on team innovation. In terms of diversity, researchers have found that the heterogeneity of team composition may facilitate better innovative performance if team members are able to channel their differences into positive outcomes (Drach-Zahavy & Somech, 2001; Doris Fay, Borrill, Amir, Howard, & West, 2006; Gebert et al., 2006; Mazenvski, 1994; Mello & Ruckes, 2006). However, diversity may also lead to higher levels of conflict and lower levels of cohesion in teams (Harrison & Klein, 2007; Shalley & Gilson, 2004). In addition to diversity, the ability of team members to communicate with colleagues and relevant external parties can also be crucial for the success of team innovation (Ancona & Caldwell, 1992; Teasley, Kodama, & Robinson, 2009). In terms of intra-team communication, open and uninhibited communication is paramount if teams are to utilise members' creativity, ideas and knowledge effectively. However, team members may not always be able to communicate with each other efficiently as many factors may undermine communication or deter individuals from expressing ideas. For instance, researchers have found that conformity pressure or majority influence may deter individuals from expressing dissent or minority opinions (Bassili, 2003; Bechtoldt, De Dreu, Nijstad, & Choi, 2010; Brodbeck, Kerschreiter, Mojzisch, Frey, & Schulz-Hardt, 2002; Hewlin, 2009). In addition to conformity pressure, researchers have found that high levels of team cohesiveness (Aldag & Fuller,

1993), non-task-related diversity (Thatcher & Brown, 2010), group norms (Blake & Mouton, 1985) and negative leadership behaviours (Amabile et al., 2004; B.-S. Cheng, Huang, & Chou, 2002) can also undermine communication in teams. In terms of external communication, how team members interact, collaborate, and network with relevant external parties can also have influential effects on innovative performance (e.g. the success of product innovation) (Ancona & Caldwell, 1992; Brown & Eisenhardt, 1995). For instance, Brown and Eisenhardt (1995) found that communicating and networking with external parties outside the team boundary can be beneficial for new product development (NPD) teams' innovative performance as the external parties' opinions may help to reflect and improve their designs.

1.2 The Need for an Alternative Theoretical Perspective

The existing literature on teamwork for innovation provides valuable insights into issues vital for understanding teamwork for innovation, but it may not be sufficient for comprehending how teams work in non-Western contexts for the following reasons. First, mainstream psychologists and team researchers often assume implicitly that research findings in the West are universally applicable across all societies (Norenzayan & Heine, 2005; Poortinga, 1999). White and Wang (1995) suggested that the strong presence of universalism in modern social science is shaped by the postmodernism paradigm which underlies hypothesis-testing theories/research. They explained that Western scientists, who adopt universalism and postmodernism, implicitly assume that theories developed in the West can be applicable universally, if their hypotheses are not falsified.

Yet, given that theories of social science are intertwined with cultural constructs, it may be ethnocentric to assume that theories which are bound up with Western culture are universally representative across all cultures.

They wrote:

'...the adoption of a universal standpoint—a hypothesis, a theory, or a law—is, in the language of postmodernity, totalizing. Modern science, including scientific psychology, is founded on the idea that abstract expert systems such as theories must be cast as universal hypotheses to be tested empirically. If they are not falsified... then they are tentatively verified and in that sense may be considered universal. ... Western science assumes it can attain essential knowledge—universal truth—that is not situated within a set of culturally bound language practices. ... To present cultural or social constructs as ultimate realities is to engage in a totalizing politics that hypostatizes one's own language game as the foundation of all communicative practices—the hallmark of ethnocentrism' (White & Wang, 1995, p.392).

Similar to White and Wang's argument, Kim and colleagues (Kim, 2000; Kim, Park, & Park, 2000) suggested that universalism in the human psyche should be grounded in empirical research conducted across cultures, rather than assumed a priori as done by many mainstream scholars. They explained that excluding culture and context from the research design alone would not be sufficient to guarantee that the findings would be free from cultural bias – and thus universally applicable. Cross-cultural researchers have found empirical evidence to indicate that teams do work differently cross cultures/societies. For example, Earley (1993) found that, in experiments, collectivists such as Israelis and Chinese students tend to outperform, while individualists such as Americans tend to slack when working in teams. Karau

and Williams (1993), in their meta-analysis of 'social loafing', explained that the reason why collectivists perform better and work harder in groups is because they are more concerned about their interpersonal relationships, which they use as an important reference to their 'interdependent self-constructs'. Besides social loafing, other researchers have found that individualism and collectivism can also have significant influences on conformity pressure. For instance, collectivists tend to conform more than individualists (R. Bond & P. B. Smith, 1996; K. Y. Ng & Van Dyne, 2001). Based on these cross-cultural comparative studies, it is clear that teamworking in non-Western contexts can be very different from that found in Western settings. Therefore, we should be cautious about assuming that findings uncovered in the West are universally applicable to all cultural groups (Segall, Dasen, Berry, & Poortinga, 1990).

Second, Engestrom (2008) and Salas, Goodwin and Burke (2009) argued that existing team literature is dominated by 'decontextualised' team research (e.g. experimental studies or studies on mock student groups). According to the authors, such decontextualised team research may offer little utility for understanding complex real-life teamworking. For instance, Paulus and Yang (2000) used groups of unacquainted American students to investigate idea generation and the exchange of creative ideas in groups. They acknowledged that their experiments on mocked student groups 'may not appropriately simulate processes that may occur for organisational groups or teams that are involved in information exchange or idea sharing over extended periods of time' (p.85). Stone-Romero (2002) also pointed out that an experimental design's lack of realism means that how people behave in manipulated experimental settings may not be representative of

real-life scenarios. Even though studies on real-life work teams are on the rise, Salas, Cooke and Rosen (2008) suggested that more research is needed to explore real-life teamworking 'in their full situated context' as 'there are few rigorous studies of teams in the wild' (p.544). Therefore, we should again be cautious about assuming that findings obtained in Western laboratories are applicable to real work teams in non-Western settings, such as teams in Chinese family businesses (CFBs).

Finally, as teams do not function in isolation, their external environment or the context in which they operate can have influential effects on how they work and innovate (Faraj & Yan, 2009). Nonetheless, existing research on the effects of team context on team innovation focus mainly on the team-level context given that team level context such as diversity in team composition have the most direct and apparent effects on team dynamics (Gebert et al., 2006). There are only a handful of studies on the effects of organisational context (e.g. Doolen, Hacker, & Aken, 2006; Faraj & Yan, 2009) or sociocultural context (e.g. Sagie & Aycan, 2003; Shalley & Gilson, 2004; Zhou & Su, 2010) on team innovation. This is probably because these aspects of team context may have more complex or less apparent effects as compared to teams' immediate contexts. As a result, much remains unknown about how organisational and sociocultural context affect teamwork and team innovation, especially in non-Western settings. Given that teams in different organisational and sociocultural settings are likely to work very differently (Cohen & Bailey, 1997), it may be more appropriate to explore how NPD teams work and innovate in the unique settings of CFBs rather than to impose Western team theories and findings.

1.3 Research Question and the Research Context

As much is unknown about team dynamics of real work teams in non-Western settings such as Chinese organisations (Phan et al., 2010), this study attempts to address this issue by exploring real-life teamwork processes in a non-Western setting, specifically, family firms in Taiwan. The research seeks to investigate two interrelated questions: (1) How do NPD or research and development (R&D) teams use teamwork to carry out product innovation in family firms in Taiwan? (2) How does their unique context affect the way they work and innovate?

Broadly speaking, family firms are companies that are owned and/or controlled by families (Chrisman, Chua, & Litz, 2004; Westhead & Cowling, 1998). They play important roles in the global economy and Taiwan is no exception. Chu (2011) suggested that 90% of private firms in the US, and most private firms in Pacific Asia are controlled by families. Taiwan as one of Pacific Asia's best performing economies, has sustained high economic growth in the past five decades and is still expanding at a pace much faster than most developed countries in the world (International Monetary Fund, 2011; The Economist, 2010). Researchers have attributed Taiwan's outstanding economic performance to robust familial entrepreneurship given that most indigenous companies in Taiwan are controlled or owned by local families (Fukuyama, 1995; Hamilton, Zeile, & Kim, 1990; Whyte, 1996; Yen, 1994a). It is estimated that family firms account for two-thirds of Taiwan's economy and employ more than half of the island's workforce (Farh, 1995). Family firms in the manufacturing sectors are important driving forces behind Taiwan's transition from an agricultural economy to an

innovation-driven and export-oriented nation (K.-K. Hwang, 1995). For instance, Hsiung (1996) used the term 'living rooms as factories' to describe how Taiwanese families utilise labours or resources available in the family to cut down on operational costs while working as original equipment manufacturers (OEMs) or satellite factories. After decades of cultivation, Taiwan's manufacturing family firms have built up extensive subcontracting networks and industrial clusters which have won the country the reputation as an 'OEM kingdom' (C.-Y. Hwang, 1995; T.-R. Lee & Koh, 2009; Redding, 1995; Shieh, 1993). In the past decade, Taiwan's manufacturing family firms have shift gradually from labour-intensive manufacturing to more innovation- and technology-driven value-adding activities such as original design manufacturing (ODM) and own brand manufacturing (OBM) as a response to the ever-increasing living standards and operational costs (W.-w. Chu, 2009; Economist, 2005; C.-H. Yang & Kuo, 2009). As a result of this transition, Taiwan now enjoys leading positions in the world's IT, electronic, and computer-component industries (T.-T. A. Huang, Stewart, & Chen, 2010; Liou, 2010; Shih & Wickramasekera, 2011).

In addition to economic roles, family firms also play important sociocultural roles for Taiwan's people. As a considerable proportion of the population either own family firms or work for their families, family businesses also represent a unique lifestyle in which family life and work life are deeply intertwined and inseparable (M.-C. Chen, 1988; B.-S. Cheng, 1993; C.-F. Yang, 1988). Cheng (1995b) even argued that most indigenous companies in Taiwan are managed like family firms and have a family-like atmosphere. This is because, traditionally, companies are extensions of family life, so traditional patriarchal familial values are still used widely for

corporate governance across private sectors (Hsiung, 1996; Shieh, 1993; Whyte, 1996). Therefore, family firms are clearly important existence for the Taiwanese because how well these firms perform has significant implications for the islanders.

Even though CFBs have been resilient in the face of major economic and political crisis and have remained highly competitive in the past few decades (Redding, 1996; Weidenbaum, 1996; T. F.-L. Yu, 2001), they are facing tough challenges in the current turbulent global economy. In the past, CFBs relied heavily on their cost-effectiveness and flexibility to compete in the global market, but nowadays being cost-effective and flexible alone may not be sufficient to survive and thrive. Like most modern enterprises, family firms in Taiwan are aware of the importance of innovation and are engaging in more innovation-driven value-adding activities (e.g. developing new products and new services) (W.-w. Chu, 2009; Siu, 2005; Yue-Ming, 2005). Although a handful of studies have examined general corporate governance (e.g. Redding, 1995; Weidenbaum & Hughes, 1996; K.-S. Yang, 1998) and executive leadership (e.g. B.-S. Cheng, 1995a; Chung & Yeun, 2003), innovation and teamwork for innovation in CFB is relatively unexplored. However, innovation and effective teamworking for innovation are vital for CFBs' competitiveness and their long-term survival (Carney & Gedajlovic, 2003; Siu, 2005).

Although Taiwanese researchers have examined knowledge sharing (H.-C. Hsu, 2005a; Y.-I. Lee & Yang, 2006; Shen, Hwang, & Cheng, 2004; M.-H. Wang, Yang, & Wu, 2006) and the effects of team structure (T.-J. Chang & Lu, 2001; Jia-Chi. Huang, 2003; Jia-Chi. Huang & Hsu, 2006; M.-P. Hwang, Chi, & Huang, 2002), these studies may not tell us much about how

teams work in CFBs. This is because they can be categorised as 'Westernised Chinese research' as the researchers have employed the mainstream perspectives and tested measurements developed in the West on Chinese participants. Taking Tu and Chang's (2006) study on Taiwanese virtual teams as an example, their study is basically a replication of Griffith and colleagues' work (Griffith & Neale, 2001; Griffith, Sawyear, & Neale, 2003) on knowledge-sharing in virtual teams on Taiwanese subjects. According to K.-S. Yang (2001), such 'Westernised Chinese psychological research' offer little utility for understanding the true psychology of native Taiwanese people as researchers fail to take into account culture, context and issues that matter for the cultural insiders when they adopt a Westernised theoretical lens. In this project, I am interested in exploring teamworking from a cultural insider's perspective rather than in testing Western constructs and research instruments (e.g. questionnaires) on those who work in Taiwanese family firms.

1.4 Research Objectives and Theoretical Lens

By exploring teamwork processes for product innovation in family firms in Taiwan, the objectives of the research reported here are to (a) gain a better understanding of how teams work in the context of CFBs, (b) explore how these family firms' unique organisational settings and sociocultural context affect team processes, and (c) make the findings 'useful' and 'culturally relevant' to the research subjects (i.e. those who work in CFBs). In a way, in-depth understanding of CFB teams may help to make more accurate predictions about what works and what does not work in Chinese teams and to provide practitioners with useful tips on how to manage teams

in the wider Chinese contexts.

In order to achieve these goals, I adopt an indigenous psychology approach as the study's theoretical lens. Indigenous psychology, which can be defined as 'the scientific study of human behaviour (or the mind) that is native, that is not transported from other regions, and that is designed for its people' (Kim & Berry, 1993, p.2), offers an arguably a more culturally-appropriate perspective alternative to mainstream psychology and cross-cultural psychology for the following reasons. First, indigenous psychology aims to tailor 'local theories' to provide better understanding of behaviours, mentalities or psychological phenomena within a specific social-cultural context (Allwood & Berry, 2006). Similarly, this project also seeks to understand teamwork in CFB NPD teams in their natural context. In contrast, researchers in general psychology or cross-cultural psychology are by and large more interested in pursuing the 'universality' in the human psyche rather than in looking for in-depth understanding of the psychology of specific ethnic groups (Segall et al., 1990).

Second, indigenous psychologists typically adopt the 'emic'¹ approach or a cultural-insider perspective, which allows researchers to explore issues prevalent in a specific cultural group and to use indigenous knowledge as the source of understanding (Kim, 2000). In contrast, cross-cultural psychology or psychology in general prefers the imposed-etic¹ approach or a cultural-outsider perspective to test presumably 'universally-applicable' Western concepts and measurements on different ethnic groups in their quest to uncover universality in the human psyche (Berry, 2000; Berry, Poortinga, Segall, & Dasen, 2002). This imposed-etic approach is widely criticised by indigenous psychologists and cultural psychologists for

elements of ethnocentrism. They argue that there is no such thing as culture-free or universally applicable theories since culture and contexts are inevitably interwoven into psychological theories (Kim, 2000; Kim & Berry, 1993; Poortinga, 1999). (More details on the emic and imposed-etic approaches will be elaborated in Chapter Two, section 2.2). Therefore, if we want to have a more holistic and in-depth understanding of how teams work in the unique context of CFBs, it seems more appropriate to use an emic approach, which allows researchers to employ indigenous knowledge as the main source of understanding.

Third, indigenous psychologists often opt for naturalistic, interpretivist and contextualist paradigms to enable them to understand their own people in context by using culture, context, and subjective meaning as the source of understanding (Kim et al., 2000; Kim, Yang, & Hwang, 2006; K.-S. Yang, 2001). In many ways, these theoretical assumptions are in line with the qualitative approach's core proposition that they all place great emphasis on trying to understand complex real-life scenarios in context and in-depth from the subject experts' points of view. On the other hand, general psychology and cross-cultural psychology typically employ the imposed-etic approach, which excludes culture, context and subjective meanings from research design in order to gather objective statistical evidence to support researchers' predetermined hypotheses. As this study aims to explore and understand real-life teamwork via subject experts' points of view rather than test the author's perceptions of how teams 'should work' in CFBs, indigenous psychology's ontological and methodological propositions are a better fit. (More details on indigenous psychology will be elaborated further in Chapter 2, section 2.4).

1.5 Key Findings

Three qualitative case studies were carried out in three Taiwanese family-run manufacturing firms, where I conducted in-depth interviews to explore how they use teamwork for product innovation. The three firms each represent a different ownership structure. The company used in case study one is a Taipei main stock market-listed multinational enterprise and is still controlled by the second generation members of the founding family. The top management team of this firm is a mixture of family executives and professional managers. In the second case study, I use a medium-sized firm, which is listed on Taiwan's secondary security-exchange market and is controlled by the founding family. This company has a family-executives-only top management team as the controlling family is reluctant to promote professional managers to senior executive positions. The family firm used in case study three is a medium-sized firm owned by the founding family, and the founder himself still has total control over the day-to-day management of the firm. Even though these family firms have very different ownership and management structures, they do have two common traits: they are manufacturers and they produce new products on a regular basis. Manufacturing CFBs are perhaps the most common form of CFBs in Taiwan, given that the manufacturing sector is the largest industrial sector in the country and the most important to its export-oriented economy (W.-w. Chu, 2009; Shih & Wickramasekera, 2011; C.-H. Yang & Kuo, 2009).

Two salient findings are established based on the results of the three case studies. First, the team processes identified are rather similar, with the exception of the owner involvement and on-the-job training. These firms'

NPD teams are managed in a highly hierarchical manner with a considerable emphasis placed on hierarchical ranking, cost-effectiveness, efficiency, practicability, and interpersonal harmony. This teamwork approach seems to be highly efficient as these teams are largely able to deliver new products efficiently and successfully via this approach. However, it is not without problems as high conformity pressure and authoritarian leadership, combined with hierarchical work arrangements, are found to inhibit creativity, undermine communication, and lead to low morale and high turnover among young NPD workers.

Second, the products developed by the three NPD teams are mostly the results of incremental innovation or copycat innovation, meaning radical and original products are rare. In many ways, CFB NPD teams may not be the perfect incubators for innovation because several aspects of their unique context can impose constraints on how they work and innovate – and thus limit the ratio of radical innovation. CFBs' unique organisational traits, including the conservative, hierarchical culture, pragmatic values, and their constant pursuit of cost-effectiveness and efficiency, are shown to inhibit creativity and the exchange of creative ideas in their teams. Conversely, there are also factors which help to promote creativity, such as their collaborations with clients and suppliers, management by objectives (MBO), proposal-appraisal panel policies, and a shared hard-working spirit. A multi-level review of these inhibitors and facilitators of creativity/innovation in CFB teams is provided to illustrate the effects of contextual factors on team innovation.

The key findings are reviewed with the implications to the existing literature and to practitioners in the concluding part of the thesis.

1.6 Structure of the Thesis

This thesis has nine chapters. This chapter provides an overview of the thesis and the remainder of which is organised as follows.

Chapter Two is a review of the literature related to this thesis. It begins with a review of the mainstream literature on teams and teamwork for innovation. Part two discusses cross-cultural psychology as an alternative to the mainstream work psychology literature on teams and gives examples of cross-cultural team research. Part three introduces indigenous psychology as another alternative to the dominant Western perspective and explains why Chinese indigenous psychology as a branch of indigenous psychology is used as the theoretical lens in this study. Finally, a theoretical framework is proposed in the concluding part of this chapter.

Chapter Three introduces the research context of family firms in Taiwan. It begins with an overview of Taiwan's societal culture. The second part gives more details about common organisational traits of CFBs. The third part explains the key characteristics of NPD teams.

Chapter Four describes the methodology used in this project. It begins with a justification for using qualitative case studies as the research strategy. The second part describes sample selection via theoretical sampling and the determination of sample size through theoretical saturation. The samples used are NPD teams in three family-run manufacturers, which are probably the most common of CFBs. The third part of the chapter explains how context-rich data were collected via one-to-one semi-structured interviews. Finally, this chapter concludes with reviews of the data analysis procedures.

Chapters Five, Six and Seven are the empirical chapters which report

the findings of the three case studies. Chapter Five explores how NPD teams carry out product innovation in Company K, which is a large family-run, stock market-listed multinational manufacturer in Taiwan. The first two parts of this chapter provide key information about the company and the structure of its R&D department. The third part describes how product development processes unfold. The fourth part explores key issues related to teamwork for product innovation, including (1) how NPD teams are managed, (2) interpersonal interaction, and (3) training and creativity. The fifth part discusses the outcomes of company K's NPD personnel teamwork effort. Finally, this chapter concludes with a chapter summary.

Chapter Six explores how an NPD team carries out product innovation in Company G, which is a medium-sized, secondary stock market-listed manufacturer in Taiwan. The first two parts of this chapter provide key information about the company and the structure of its R&D department. The third part describes how product development processes unfold. The fourth part explores key issues related to teamwork for product innovation, including (1) how Company G's NPD team is managed, (2) interpersonal interaction, and (3) training and creativity. The fifth part discusses the outcomes of their NPD personnel's teamwork effort. Finally, this chapter concludes with a chapter summary.

Chapter Seven is a case study which explores how an NPD team carries out product innovation in Company F, which is a medium-sized, family-owned manufacturer in Taiwan. The first two parts of this chapter provide key information about the company and the structure of its R&D department. The third part describes how product development processes unfold. The fourth part explores key issues related to teamwork for product

innovation, including (1) how Company F's NPD team was managed, (2) interpersonal interaction, and (3) training and creativity. The fifth part discusses the team outcomes of their NPD personnel's teamwork effort. Finally, this chapter concludes with a chapter summary.

Chapter Eight summarises the key findings with a cross-cases review of the common themes and divergences found across the three case studies. The first part of the chapter examines common teamwork processes found in CFB NPD teams. The second part of the chapter discusses the complex effects of contexts on CFBs and their teams. The third part is a multi-level review of contextual factors' facilitating or inhibiting effects on team creativity or innovation. The fourth part compares the two key divergences: different levels of owners' involvement and on-the-job training. Finally, this chapter concludes with a chapter summary.

Chapter Nine concludes this study with discussions on the implication and limitation of the findings. First part of the chapter discusses the possible contributions to CFB and Chinese management literature and to the mainstream team literature. The second part proposes practical implications of the findings. The third part of the chapter reviews limitations of the findings and provides some directions for future research. Finally, this study draws to an end with a brief conclusion.

Chapter 2 Literature Review

2.0 Introduction

The focus of the study is to explore teamworking in the unique settings of Taiwanese family firms as a type of CFB according to Redding (1990; 1995). This chapter will provide a review of the existing studies related to teamworking and teamwork for innovation from three different theoretical perspectives: a mainstream perspective, a cross-cultural comparative approach, and an indigenous psychology perspective. This chapter is organised as follows. The first part reviews the mainstream literature on teamwork for innovation. The second part introduces cross-cultural psychology as an alternative theoretical perspective and gives examples of cross-cultural comparative team research. The third part then introduces another theoretical perspective — indigenous psychology — and explains why this particular perspective is most suitable for this research. The concluding part of the chapter proposes a theoretical framework and explains the rationales behind the theoretical framework underlying the study.

2.1 Mainstream Literature on Teamwork for Innovation

Faraj and Yan (2009) pointed out that while modern organisations have become 'more and more debureaucratised, boundaryless, network based, temporarily structured, geographically dispersed, and electronically mediated,' there is an ever-increasing use of teams to adapt to these changes (p.604). As teamworking becomes 'a way of organisational life',

researchers and practitioners alike are keen to decipher the secrets behind effective and productive teamworking (Salas et al., 2008). This section will briefly review existing mainstream team literature that has been developed mainly in Western settings.

2.1.1 Definition of Teams

The terms 'work groups' and 'teams' are often used interchangeably by researchers (Mohammed, Hamilton, & Lim, 2009). According to Hackman and Oldham (1980), work groups can be defined as a group of people who 'plan and labour together to generate real group products' (p.165). Conversely, Katzenbach and Smith (1993) argued that not all work groups are teams, especially given that in work groups individuals do not necessarily have to share collective responsibilities with fellow group members and thus they may not work interdependently. Given such a difference, they defined teams as 'a small number of people with complementary skills who are committed to a common purpose, set of performance goals, and approach for which they hold themselves mutually accountable' (p.113). In a more recent review, Salas et al. (2008) defined teams as social entities that are composed of members who work interdependently to 'integrate, synthesize, and share information' and 'to coordinate and cooperate as task demands shift throughout a performance episode to accomplish their mission' (p.541).

Even though researchers may have different ideas about what constitutes teams and work groups, for practitioners they probably mean the same thing – as the basic units of organisations, or as work arrangements used to divide tasks and responsibilities (Nijstad & De Dreu, 2002; Rousseau,

Aubé, & Savoie, 2006).

2.1.2 The Use of Teams in Organisations

The use of teams in organisations can have benefits as well as drawbacks. In terms of benefits, teams can be more efficient, practical and flexible as compared to individuals or organisations. For example, a team as a whole can come up with better decisions, be more creative, or deliver better results than individual team members working alone given 'the synergy effect' or 'positive synergy' (R. A. Cooke & Szumal, 1994; Gebert et al., 2006; Tjosvold, 1991). There can be many reasons for this 'synergy effect' in teams. For one, close interpersonal interaction and communication (e.g. brainstorming activities) may stimulate team members to learn about and consider issues at hand from diverse perspectives and thus help to improve the quality of team decisions (Craig & Kelly, 1999; Sun, Slusarz, & Terry, 2005). Another driving force behind the synergy effect is the interdependent nature of teamwork. Team members may be willing to work harder and collaborate with each other to achieve shared goals as they are held accountable for shared responsibilities (De Dreu, 2007). Besides the synergy effect, teams can also be more efficient than their organisation as a whole, mainly because they are smaller in size and are therefore more manageable and adaptive (Barry & Stewart, 1997). Besides efficiency and productivity, organisations can also use different types of teams flexibly to suit their needs, such as by cherry-picking team members from their in-house talent pool, or using temporary teams to deal with one-off tasks (Guzzo, 1996). There are several types of teams commonly used in organisations – project teams, top management teams, sales teams, quality

control teams, etc. In addition to higher productivity and flexibility, teams can also provide social support, psychological safety and a sense of belonging, all of which can function as important motivators to drive better contribution and participation (Edmondson, 1999).

In contrast with these potential benefits, the use of teamwork is not without problems. For instance, researchers have found that teams as a whole may not be as effective or productive compared to individual team members working alone because individuals withhold efforts and information (Price, Harrison, & Gavin, 2006). This phenomenon is known as 'process loss', 'productivity loss' or 'social loafing' (Hackman & Morris, 1975; Levine & Resnick, 1993; Mullen, Johnson, & Salas, 1991). For example, individuals may withhold information or be unwilling to share their knowledge with colleagues if they do not trust their team members or if they believe that they are being treated unfairly (T.-C. Lin & Huang, 2010). Paulus and Yang (2000) proposed three other reasons behind productivity loss in teams: evaluation apprehension, production blocking, and free-riding. According to them, individuals may not wish to share ideas with others when they are worried about negative reception, when they are interrupted during the course of group interaction, or when they do not feel accountable for the group's responsibilities.

2.1.3 Teamwork for Innovation

Even though teams or work groups do not always work (Hackman, 1990), using teamwork to accomplish innovation has become a common practice in organisations (e.g. the use of R&D teams) (Drach-Zahavy & Somech, 2001; S. E. Jackson, 1996). Teamwork can be defined as the

'dynamic, simultaneous and recursive enactment of process mechanisms which inhibit or contribute to team performance and performance outcomes' (Salas, Stagl, Burke, & Goodwin, 2007, p.190). So far, researchers have offered many theories from different theoretical perspectives to explain teamwork for innovation, and the key studies in this domain are summarised in Table 2.1. Of these studies, the classical input-process-output model is perhaps the most influential school of thought. In this stream of research, innovation in teams is regarded as a result of input factors (e.g. team composition and organisational context) being transformed into outputs via team processes (e.g. commitment to objectives, participation, task orientation, and leaders' support for innovation) (West & Anderson, 1996; West et al., 1998; West & Hirst, 2003).

Although the classical I-P-O model provides a simple, easy to understand view of how teams work, it has been criticised by researchers for being 'oversimplifying', 'static', and failing to capture the complex, dynamic and continual nature of real-life teamwork (Ilgen et al., 2005; Salas, Rosen, Burke, & Goodwin, 2009). As an alternative to the static I-P-O models, researchers have offered more dynamic views of teamwork patterns. For instance, there are several studies which adopt a dynamic system perspective to conceptualise teamwork as continual sequences of multiple episodes which evolve and transit over time. For instance, Marks, Mathieu and Zaccaro (2001) suggested that 'teams are multitasking units that perform multiple processes simultaneously and sequentially to orchestrate goal-directed taskwork' (p356). They proposed a temporal model in which team work is described as a series of multiple I-P-O episodes during different phases of task achievement. Conversely, Ilgen et al. (2005) proposed an

Input–Mediator–Output–Input (IMOI) framework in which they replaced the term process with mediators to cover a broader range of factors vital for team effectiveness. Another key trait of this IMOI model is that it portrays teamwork as a series of circular events because team outputs can have lasting effects on how they work in the future and thus affect their performance.

Besides I-P-O and temporal models, researchers have also used team adaptation theories to conceptualise teamwork for innovation. As changes become an 'ever present reality of modern organisational living', the use of teamwork may help organisations to adapt to changes and to innovate (Courtney, Navarro, & O'Hare, 2007, p.34). Burke, Stagl, Salas, Pierce and Kendall (2006) proposed a rather sophisticated 'input-throughput-output model of team adaptation' to explain team innovation. They described team innovation as the result of how adaptive team processes (e.g. assess the situation, formulate a plan, execute the plan and team learning) transform individual team members' characteristics (e.g. knowledge and skills) into desired team outcomes.

Table 2.1: Selected studies on models of teamwork for innovation

Theoretical lens	Core theoretical assumption	Selected studies and their key findings
Classical input-process-output (I-P-O) model	Teamwork as a simple linear process in which inputs are transformed into output via team processes.	Innovation is the result of input factors such as task and team composition being turned into output via iterative teamwork processes such as leadership and communication (e.g. West & Anderson, 1996; West et al., 1998; West & Hirst, 2003).
Non-linear, sequential/temporal models	Teamwork as continual sequences of multiple events or episodes which evolve and transit over time.	Marks, Mathieu and Zaccaro (2001), in their temporal model, conceptualised as teamwork a series of multiple I-P-O episodes during different phases of task achievement. Ilgen et al. (2005) proposed an Input-Mediator-Output-Input (IMOI) framework to describe teamwork as continual cycles rather than a one-off linear event.
Team adaptation theories	Innovation is synonymous with change and teamwork can be great for adapting to changes and to achieve innovation. Individual efforts are transformed into innovation via team adaptive behaviours.	Burke, Stagl, Salas, Pierce and Kendall (2006) in their 'input-throughput-output model of team described team innovation as a result of how adaptive team processes (e.g. assess situation, formulate a plan, execute the plan, and team learning) transform individual team members' characteristics (e.g. knowledge and skills) into desired team outcomes.
Creativity and social influence	Individual creativity as the input for group innovation is affected by social context as well social influences and psychological processes.	Paulus and Dzindolet (2008) described innovation in groups as the results of group, task situational variables (e.g. group member variables) being transformed via dynamic, iterative group processes - cognitive, motivational, and social processes.

Creativity is another theoretical perspective used widely to explain innovation in teams. For teams, individual members' creativity is an indispensable asset for team performance and innovation. Creativity is considered as the first step of innovation, which consists of two phases: first the generation of creative ideas and then the implementation of new ideas (De Dreu, Nijstad, Bechtoldt, & Baas, 2011; Hammond, Neff, Farr, Schwall, & Zhao, 2011; West, 2002b). Given the importance of creativity, researchers have explored what inspires individual creativity and how creativity can be utilised to achieve innovation in teams. In terms of the driving forces behind creativity, Amabile (1983) pointed out that creativity can be intrinsically inspired as well as extrinsically motivated. Intrinsically, cognitive capacity, personality, experience, knowledge and expertise are important factors which underlie novel thoughts and creative behaviours at individual level (Amabile, 1996; Paulus & Yang, 2000). For instance, Paulus, Levine, Brown, Minai and Doblin (2010) proposed two complex conceptual models to explain how we use different parts of our brain to process external stimuli and to develop creative ideas from a combination of neural science and cognitive theory perspectives. Given that creativity is a function of personality characteristics and individual cognitive processes, selecting team members with right sort of creative traits (e.g. expertise, risk-taking, creative thinking skills, and self-efficacy) and positive attitude can be vital for teams' innovative performance (Amabile, 1997; Lim & Choi, 2009; C.-W. Wang, Wu, & Horng, 1999). Extrinsically, creativity can be nurtured. As we do not live or work in isolation, social context can have a significant impact on our cognitive and psychological processes, thus affect creative performances of individuals and teams (Erez & Nouri, 2010; Thatcher & Brown, 2010).

Researchers have suggested that creativity can be incubated providing the right sort of environment such as challenging tasks (Hammond et al., 2011), learning and training (Amar & Juneja, 2008), trust and culture of collaboration (Barczak et al., 2010), autonomy (Grawitch, Munz, Elliott, & Mathis, 2003; Hunter, Bedell, & Mumford, 2007), supervisory support (Hirst, Van Dick, & Van Knippenberg, 2009; Shalley & Gilson, 2004), as well as sufficient resources and rewards for creativity (Amabile, Conti, Coon, Lazenby, & Heerron, 1996). In contrast, creativities may be inhibited or undermined by an autocratic style of leadership, insufficient resources, unrealistic deadlines, or conformity pressure (Amabile, 1999; Pech, 2001; Reiter-Palmon & Illies, 2004; Woodman, Sawyer, & Griffin, 1993).

In terms of how teams utilise their members' creativity, which resides in individuals' minds, social interactions such as communication is required (Amar & Juneja, 2008). From a social influence point of view, Paulus and Dzindolet (2008) proposed a model of group creativity. In their model, innovation in groups are conceptualised as the results of group and task situational variables (e.g. group member variables, group structure, and group climate, external demand) being transformed via dynamic, iterative group processes, including cognitive, motivational, and social processes. Creative ideas are generated via team members' cognitive processes and shared via social interactions (e.g. communication, conflict) so that the generation and exchange of creative ideas are affected by social influences as well as social contexts.

In addition to studies on overall teamwork patterns for innovation, another stream of research focus on the effects of team processes, such as diversity and communication, on team innovation. Diversities or team

compositions have been studied extensively by team researchers because diversity is regarded as a key predictor for innovation (Folkestad & Gonzalez, 2010). Diversity or team compositions have decisive effects on what human assets (e.g. expertise, knowledge, skills, and personalities) are available in teams, and these assets are indispensable for creativity or innovation. According to Harrison and Klein (2007), diversity can be defined as 'the distribution of differences among the members of a unit with respect to a common attribute X, such as tenure, ethnicity, conscientiousness, task attitude, or pay' (p.1200). They suggested that diversity can be divided into three categories: (1) separation (e.g. opinions, beliefs, values, and attitudes), (2) variety (e.g. expertise, functional background, network ties, and industry experience), and (3) disparity (e.g. pay, income, prestige, status, authority, and social power). As diversity can mean many different things, not surprisingly researchers have found conflicting results regarding its effects on team performance and innovation. On the one hand, researchers have found that diversity, especially task- or job- related diversity (e.g. expertise, experience and educational background), may enhance the quality of decision-making, innovation or effectiveness in teams (Hülshager, Anderson, & Salgado, 2009). Gebert, Boerner and Kearney (2006) explained that task-related diversity or cross functionality can trigger synergistic communication in which 'diverging positions are specified and recombined to generate new and useful solutions', and thus foster innovation. On the other hand, there are also studies which have found that diversity may affect team effectiveness in a negative way, such as causing more tension and conflicts, or obstructing communication (Mohammed & Angell, 2004; van Knippenberg & Schippers, 2007). For instance, Kooij-de

Bode, van Knippenberg and van Ginkel (2008) found that ethnic diversity can impede information sharing in student teams. Conversely, Gillespie, Chaboyer, Lonbottom and Wallis (2010) found that the cross-functionality of surgical teams can lead to more complex interpersonal relations and may hinder team cohesiveness.

In addition to diversity, researchers have also carried out extensive research on communication in teams as a team is a 'task-oriented unit that emphasizes complementary cooperation and communication' (Chou, Cheng, Huang, & Cheng, 2006, p.92). How team members express, exchange and evaluate knowledge, information and ideas is crucial for team performance and effectiveness. Yet, teams may not always be able to communicate efficiently to make the best of their members' knowledge and ideas because not all members are willing to share information or express opinions. Researchers have offered various theories to explain communication problems in teams from various theoretical perspectives. From a knowledge management point of view, researchers have suggested that teams often have difficulties in sharing or utilising tacit knowledge (e.g. personal insights and intuition), which is a key ingredient for innovation (Bloodgood & Salisbury, 2001; Mazenvski, 1994; McInerney, 2002). This is because this type of knowledge is difficult to articulate, transfer, or communicate through conversation (Mascitelli, 2000; Nonaka, 1991). From a social psychology point of view, social influences such as conformity pressure or majority influence are found to be the main causes of the 'hidden profile phenomenon', whereby individuals withhold ideas and information from colleagues (Brodbeck et al., 2002; D. Fay & Brodbeck, 2001; Greitemeyer & Schulz-Hardt, 2003). As conformity pressure and majority influence can

undermine communication (e.g. the exchange of creative ideas) in teams, they are often considered as inhibitors of innovation (Moscovici, 1985; S. Wang & Noe, 2010; West, 2002b). Moreover, from an economic point of view, Pech (2001) and Prendergast (1993) both suggested that employees, especially subordinates, often choose to conform and behave like a bunch of 'yes men' rather than to share information and express opinions as conforming can be more rewarding than dissenting. This is because conformity can function like 'a means to satisfy needs, such as the need for approval, recognition and perhaps power' (Pech, 2001, p.563). Additionally, dissenting or expressing truthful opinion may lead to undesirable consequences such as causing conflict, antagonising the boss, or receiving negative evaluations (e.g. being singled out as a deviant) (Pech, 2001). Judging from these different perspectives, the reasons why team may have problems getting members to share what they know or what they think can be complex and multifaceted. Researchers have offered various remedies to encourage less inhibited communication in teams, such as 'Devils' advocate' (De Dreu, Harinck, & Van Vianen, 1999), constructive controversy (West, 1994), and a work environment that provides safety, opportunities, and rewards for contributing ideas (Hammond et al., 2011; Mascitelli, 2000; Thatcher & Brown, 2010).

2.1.4 Limitations of the Mainstream Perspective

Even though these mainstream studies provide us with valuable insights into the general patterns of teamwork for innovation, they may offer limited utility for helping us to understand how teams work and carry out innovation in non-Western settings. There are two reasons why this is the case. First,

the bulk of the existing team literature has been developed in the West. Like the mainstream management and psychology literature, there is an implicit universalistic assumption that findings obtained in the West are universally applicable to teams across all cultures (Norenzayan & Heine, 2005). Many indigenous psychologists have argued that such universalism assumption has traces of ethnocentrism (Adair, 1999; Berry et al., 2002; Leung, 2009; Poortinga, 1999). There are also empirical evidences (e.g. Hofstede, 1991; House, Hanges, Javidan, Dorfman, & Gupta, 2004) to indicate that people do actually think, behave and work differently across societies.

Second, Engestrom (2008) pointed out that existing team literature is dominated by 'decontextualised experimental studies', which are 'aimed at finding laws of group behaviour that are independent of cultural and institutional specifics' (p.4). Nevertheless, laws or statistical correlations between selected variables found in controlled experiments may offer little utility for understanding complex real-life teamworking because, in real teams, teamworking is much more complex than just interplays between a few variables (Salas & Wildman, 2009). The sociocultural and organisational contexts in which the teams are embedded, the multiple tasks that teams deal with, and the every-changing situational factors can all have a significant impact on how teams work and innovate (Dayan & Di Benedetto, 2010; Doolen, Hacker, & Van Aken, 2003; Faraj & Yan, 2009). Salas and colleagues also suggested that more research on real-life teamworking is needed as much remains unknown about how culture and context affect complex teamworking 'in the wild' (Salas et al., 2008; Salas & Wildman, 2009).

Finally, even though teams' contexts can have important effects on

teams, much is still unknown about how they affect teamworking as existing studies on team contexts focus mainly on team level. For instance, there is extensive research on the effects of diversity and team members' knowledge and expertise on team effectiveness (Hülsheger et al., 2009). The effects of other aspects of team context, such as organisational, industrial, and wider sociocultural contexts have not been fully explored (Salas & Wildman, 2009). This is probably because team-level contexts have more direct and obvious effects on how teams work as compared to other aspects of team contexts (e.g. sociocultural contexts). Another possible reason is that organisational, industrial, and sociocultural contexts each represent a set of complex issues, so that it may not be possible to verify their full effects on teamworking in great detail. However, these external contexts do have influential effects on how they work and interact as teams in different contextual settings are likely to work very differently and have different priorities and objectives. For instance, researchers (e.g. Earley, 1993; Gelfand, Erez, & Zeynep, 2007; Jung, Sosik, & Baik, 2002; Tiessen, 1997) have found that sociocultural context and culture (e.g. individualism or collectivism) are important reasons why people think and work differently in teams across societies. Furthermore, Fuxman (1999) found that work teams in Japanese automobile companies like Toyota have rather different work patterns as compared to teams in Western automobile firms like Ford. He suggested that Japanese automobile teams work more interdependently, and usually have clearly-defined leaders who deal with administrative matters and lead the team. In contrast, Western automobile teams work less interdependently and there is usually no well-defined team leader. Given these differences, we should be cautious about assuming the findings obtained in Western

contexts are applicable for explaining team dynamics in very different contextual/cultural settings (e.g. CFB teams).

2.2 Cross-Cultural Psychology and Cross-cultural Team

Research

In addition to the mainstream perspective which is dominated by Western views (Leung, 2009), other theoretical perspectives take culture and context into consideration, namely cross-cultural psychology, ethnopsychology, cultural psychology and indigenous psychology. This section will briefly review cross-cultural psychology, which is used by many team researchers as an alternative to the mainstream perspective. Examples of cross-cultural comparative team/group studies will also be reviewed as they may provide valuable information regarding teamworking in the Chinese context from a comparative perspective.

2.2.1 Cross-cultural Psychology

Cross-cultural psychology can be defined as the study:

'...of similarities and differences in individual psychological functioning in various cultural and ethnocultural groups; of the relationship between psychological variables and socio-cultural, ecological and biological variables; and of ongoing changes in these variables.' (Berry et al., 2002, p. 3)

Broadly speaking, three approaches are used in cross-cultural research: (1) the etic/imposed-etic approach, (2) the emic approach, and (3) the integrated approach (i.e. a mixture of the emic and etic approaches). The

terms 'emic' and 'etic' were coined by Pike (1954) from the linguistic concepts of 'phonemics' (the study of sounds whose meaning-bearing roles are unique to a particular language) and 'phonetics' (the study of universal sounds used in the human language, their particular meaning aside) (c.f. Berry et al., 2002; Segall et al., 1990; Smith & Bond, 1998). The distinction between these approaches can be considered as a conceptual tool which is used by cultural psychologists to help them clarify their underlying theoretical standpoints and to choose a research design accordingly (Morris, Leung, Ames, & Lickel, 1999).

First, the etic (i.e. universal) approach seeks to uncover universal laws in the human psyche which is the primary goal of cross-cultural psychology (Berry, 2000). Researchers (e.g. Kim, Park, & Park, 1999; Segall et al., 1990) have used the term 'imposed-etic' to replace the term 'etic' because in this approach, universality is imposed upon research instruments rather than grounded in empirical evidence and therefore the universality derived from this approach is not true etic but 'pseudo etic'. Nevertheless, the imposed-etic approach is still widely used in most cross-cultural comparative studies. Moreover, the imposed-etic approach is also known as the 'cultural-outsider approach' given that researchers who employ this approach position themselves as objective cultural outsiders (Berry, 1990). By distancing themselves from 'subjective culture', researchers may be able to develop unbiased concepts and measurements and test them on different cultural groups in order to uncover universality in the human psyche (Kim et al., 2000). This assumption is shaped by the underlying paradigms of mainstream psychology and management literature: universalism and positivism (Greenfield, 2000; Kim, 2000). In terms of the effects of

universalism, researchers who adopt the imposed-etic approach believe that universal structures of culture and universally applicable constructs and measurements can be transported from one culture and imposed on another to test validity (Kim & Berry, 1993; Schwartz & Bilsky, 1987; Segall et al., 1990). According to Schaffer and Riordan (2003), the basic assumption of the etic approach is that universal shared-frame of reference do exist in all human societies, so that measurements 'mean the same thing' and thus can be applied in different cultures or societies. In terms of the influence of positivism, culture in the imposed-etic approach is considered as a stable, static independent variable, which 'causes' differences in mentality and behaviours observed across societies and can be measured via quantitative instruments (e.g. survey, statistic correlations) (House et al., 2004; Segall, Dasen, Berry, & Poortinga, 1999).

Under the influence of these two paradigms, the great majority of cross-cultural comparative studies employ presumably universally applicable survey to measure cultural similarities and differences across various societies (e.g. Hofstede, 1991; House et al., 2004; Schwartz, 1992; Schwartz & Bilsky, 1990). For instance, Hofstede proposed (1980) that societal culture can be divided into four key aspects: individualism/collectivism, feminism/masculinity, power distance, and uncertainty avoidance. Later, he added a fifth dimension – long-term/short-term orientation (Hofstede, 1991). His landmark work has inspired many subsequent studies, such as the Global Leadership and Organisational Behaviour Effective study (GLOBE project)³ (House et al., 2004) which replicates and extends Hofstede's (1980; 1991) work. In Addition to replications of Hofstede's work, there are a considerable number

of studies which use one or two dimensions of Hofstede's constructs as key theoretical constructs or independent variables. For instance, Smith, Dugan, Peterson, and Leung (1998) used individualism/collectivism and power distance as independent variables to compare how people handle work place disagreement with in-groups and out-groups across 23 nations.

Second, besides the imposed-etic approach, researchers can choose to use the emic approach as an alternative. Unlike the imposed-etic approach seeks to uncover universal laws of human psyche, the emic approach seeks to gain an in-depth understanding of the mentality, causes and mechanisms behind cultural-specific phenomena within a single culture (Kim & Berry, 1993). In the emic approach, culture and sociocultural phenomena are understood in context and interpreted via a dynamic, interactive perspective, in which culture perceived as a fluid, emergent property that is 'constructed and maintained through interactions of the members of the culture' (P. R. Jackson, 2005, p.53). Under such a contextual and interpretative view, researchers typically employ indigenous knowledge, cultural insiders' subjective experiences and feelings, and local frames of reference as sources of understanding in their attempts to capture a more accurate portrait of what occurs in a specific context. Therefore, the qualitative approach is used widely in emic studies in order to help explore sociocultural phenomena thoroughly. Therefore, the qualitative approach is widely used as the methodology in emic studies to enable in-depth exploration of sociocultural phenomena. Quantitative measurements, which are developed using local concepts, are often used as follow-ups to test or refine initial interpretations. Even though the emic approach's underlying contextualism and interpretativism and the use of the qualitative approach are very

different compared to the imposed-etic approach's universalism, positivism and preference for the quantitative approach, some researchers (e.g. Schaffer & Riordan, 2003; Segall et al., 1990) still categorise emic studies as a type of cross-cultural psychology research. In recent years, as more and more non-Western researchers (e.g. Chinese researchers) have chosen to adopt the emic approach or the indigenous perspective (Leung, 2009), the fast-growing numbers of emic studies have led to the emergence of new disciplines: indigenous psychology, ethnopsychology, and cultural psychology (P. R. Jackson, 2005; Shweder, 2000; K.-S. Yang, 2000). Table 2.2 offers a summary of the emic and etic approaches.

Third, some researchers adopt an integrated approach by employing a mixture of emic and etic approaches, such as Bond and colleagues' work (The Chinese Culture Connection, 1987) on Chinese cultural value. The authors developed a Chinese value survey (CVS) based on their exploration of indigenous Chinese values and then tested this survey across 22 societies. Segall et al. (1990) described this approach as 'testing etics out of emics' — given that the CVS measurements were developed using an emic approach and then tested across various societies to test their validity via an imposed-etic approach.

Judging from these three different approaches and theoretical propositions, it is clear that cross-cultural psychology as a discipline can be rather heterogeneous in nature. The next section presents examples of cross-cultural comparative team research, which may provide some clues for understanding teamwork in the Chinese context.

Table 2.2: Characteristics of the emic and etic/imposed-etic approaches

	Emic	Etic/imposed-etic
Researcher's position	As cultural insiders who have good knowledge and abundant experience about culture, custom, history, language, etc.	As objective cultural outsiders who distance themselves from any culture in order to develop unbiased measurements and constructs which are presumably universally applicable
Scope of research	Typically one culture, usually the researcher's home culture	Two or more cultures, which not necessarily include researcher's home culture
Paradigm	Interpretivist, contextualist paradigm	Positivism, universalism paradigm
Aim	Seek to explore and understand culture-specific phenomena in one culture from subject experts' points of views	Seek for universal laws in culture and human psyche across different cultural/ethnic groups and uncover cultural differences when universality cannot be found
Source of knowledge	Use indigenous knowledge as primary source of knowledge to tailor cultural-fit theories	Import theories and concepts from researcher's home culture (typically Western cultures) to other cultures
Methodological preference	Mainly qualitative approach; quantitative measurement which are developed with local concepts are often used as follow-ups	Predominantly quantitative approach such as survey and experiments
Disciplines	Indigenous psychology, ethnopsychology, cultural psychology	Cross-cultural psychology

(Source: Berry, 1989; Berry et al., 2002; Headland, Pike, & Harris, 1990; Morris et al., 1999; Segall et al., 1990; Smith & Bond, 1998)

2.2.2 Cross-cultural Comparative Team Research

So far, quite a few cross-cultural comparative studies offered comparative views over how groups or teams work differently across different cultural settings. Table 2.3 lists out a selection of studies which compared team dynamics of collectivists and individualists groups/teams, such as social loafing, autonomy, conflict management, leadership, conformity, and empowerment.

In terms of social loafing, Earley (1993) used student groups in experiments to explore social loafing in collectivist and individualist groups. She found that collectivists such as Israelis and Chinese tend to work harder when working in groups, while individualists like Americans tend to work better when working alone. Karau and Williams (1993) also found similar results in their meta-analysis on social loafing studies. They explained that social attachments between collectivists make them more unlikely to loaf in groups as compared to individualists. This is because collectivists are more group-oriented as they take relevant other's evaluations towards them and their interpersonal relationships as important references for their identities and self-constructs.

In terms of autonomy in teams, Man and Lam (2003) tested the moderating effect of collectivism and individualism on the relationship between task complexity, autonomy and team cohesiveness. They found that when working in teams, individualists like Americans enjoy their autonomy more than collectivists such as Hong Kong-Chinese.

Table 2.3: Examples of cross-cultural comparative studies on individualistic and collectivistic groups

Team dynamics	Method and Samples	Researchers and Key Findings
Social loafing	Experiments-students groups Individualists: Americans Collectivists: Israelis and Chinese	Earley (1993) found collectivists outperform when working in groups. Conversely, individualists perform better when working alone.
Social loafing	Meta-analysis	Karau and Williams (1993) found that social attachment between collectivists make them more unlikely to loaf in group as compared to individualists.
Autonomy	Work teams in a multinational bank Individualists: Americans Collectivists: Chinese (Hong Kong)	Man and Lam (2003) found individualists enjoy their autonomy more than collectivists, when working in teams.
Conflict management/ Negotiation	Experiments-students groups Individualists: Americans Collectivists: Chinese (Hong Kong)	Tinsley and Brett (2001) found that Chinese/collectivists are more concerned about collective interests, authority, and counterparts' reactions than Americans when dealing with conflicts..
Transformational and transactional leadership	Experiment-student groups Individualistic: Americans Collectivists: Chinese, Korean	Jung and Avolio (1999) found collectivists with a transformational leader generated more ideas, but individualists generated more ideas with a transactional leader.
Conformity	Meta-analysis	R. Bond and Smith (1996) found that collectivists tend to conform more than individualists
Empowerment and attachment	Experiments and field study Individualists: U.S. Collectivists: Chinese (China)	Chen, Sharma, Edinger, Shapiro and Farh (2011) found that individuals from a less collectivistic society (e.g. U.S.) were also more likely to feel psychologically empowered than individuals from a more collectivistic society when working in groups.

In terms of conflict management, Tinsley and Brett (2001) used experiments to explore how cultural norms affect how individualists and collectivists deal with conflicts in teams. They found that collectivists such as Hong Kong-Chinese are more concerned about collective interests, authority, and counterparts' reactions than Americans when dealing with conflicts. They explained that this is because Chinese society places more emphasis on social harmony, social hierarchy and collective interest. They also found that Chinese participants are also more likely to leave conflicts or issues unsolved or take them to higher management, while Americans tend to resolve issues/conflicts straight away using an integrative approach.

In terms of leadership in teams, Jung and Avolio (1999) used student samples in experiments in their attempt to compare how individualists (e.g. Caucasian American) and collectivists (e.g. Chinese, Korean, Japanese) react to two different leadership styles – transformational and transactional. They found that collectivists with a transformational leader generated more ideas, but individualists generated more ideas with a transactional leader, while collectivists were less conformable questioning leaders. They explained that these differences are probably caused by the fact that collectivists are more concerned about maintaining harmonious relationships with others.

In terms of conformity, R. Bond and Smith (1996), in their meta-analysis of the conformity literature, found that collectivists tend to conform more than individualists. According to them, collectivists are more concerned about their in-group identities and interpersonal ties, which they use as important references for self-constructs. Therefore, they are

more willing to conform and yield to others as compared to individualists. Yet, in a more recent study, Takano and Sogon (2008), in their replication of Asch's (1956) experimental work on conformity, found that Japanese students – as examples of collectivists – did not conform more than individualist Americans. They argued that, in comparison with individualists, collectivist students may not necessarily cooperate more or conform more with their team-mates for the sake of their in-group membership or self-identity.

Finally, in terms of the effects of empowerment in teams, Chen, Sharma, Edinger, Shapiro and Farh (2011) used student groups to explore how individualists and collectivists react to empowering leadership. They found that individuals from a less collectivistic society (e.g. American students) were more likely to feel psychologically empowered than individuals from a more collectivistic society (e.g. Chinese students) when working in groups.

2.2.3 Limitations of the Cross-cultural Comparative Perspective

Even though cross-cultural team research provides valuable insights into the different group dynamics observed across various ethnic groups (e.g. collectivist Chinese versus individualist Americans), it may not be suitable for exploring team dynamics in CFBs for the following reasons.

First, as explained earlier, the objective of the present study is not to compare how CFB teams work differently as compared to Western teams, but to gain an in-depth understanding of how they actually work. The cross-cultural comparative approach is mainly designed to enable researchers to measure levels of difference between selected cultural

groups through imposing and testing existing theories and measurements developed mainly in the West. As Berry et al. (2002) pointed out, the primary goal of cross-cultural psychology is to 'transport present hypotheses, theories, and findings in one culture to another cultural settings in order to test their validity and applicability in other (and, eventually, in all) groups of human beings' (p.3). When using Western constructs as the theoretical lens to investigate non-Westerners, researchers have to eliminate local issues or cultural-specific constructs from the research design because these contextual factors may corrupt the reliability of the presumably universal Western measurements. For instance, Azuma (1984) pointed out:

'As a set of concepts and theories developed in the industrialized West, modern psychology lacks some concepts crucial to describing and understanding the mind in a very different culture. It may even include some concepts that distort perception and block a deep understanding when applied to another culture. When a psychologist looks at a non-Western culture through Western glasses, he may fail to notice important aspects of the non-Western culture since the schemata for recognizing them are not provided in his science' (Azuma, 1984, p. 49).

As a result of the exclusions of cultural-specific knowledge and a filtered theoretical lens, the findings obtained through the imposed-etic approach may only reflect snapshots rather than a holistic picture of what goes on in non-Western settings. For instance, Ratner (2002) pointed out that the findings of multinational cross-cultural comparative studies are 'merely descriptive' because they only provide descriptions about the 'levels of statistical differences' observed across selected ethnic groups. C.F. Yang

(1996) also suggested that the abstract statistical differences found in cross-cultural comparative studies are not sufficient to explain the complex mechanisms of how culture shapes psychological phenomena and behaviours in different cultural settings. In other words, cross-cultural comparative studies often tell us that certain cultural groups are different, but they do not tell us why and what caused the differences.

Second, conceptual debates rage about the use of 'universally applicable' measurements to measure cultural difference in cross-cultural comparative studies. On the one hand, cross-cultural psychologists generally acknowledged that cultural differences are the reasons why we think, behave and work differently across societies (Berry et al., 2002). On the other hand, they use universalism as a means of uncovering 'cultural differences' by assuming that Western concepts and measurements are universally applicable to all ethnic groups, and therefore they can be 'transported to' and imposed on all cultural groups to test their 'validity and applicability' (Berry et al., 2002, p.3). If these presumably universal measurements fail to explain how things are in other cultures, then researchers can then uncover 'cultural differences' (Kim, 2000). The paradox between the two sides of the arguments may raise doubts about the reliability and validity of the cultural differences found through such an approach.

Third, in addition to conceptual issues, researchers have also raised concerns regarding methodologies used in multinational comparative studies, such as the reliability of presumably universal measurements, language, and sampling issues. In terms of the reliability of measurements, researchers have pointed out that the presumably universal

measurements developed mainly by Western researchers may not be truly universal given that there may not be a 'universal frame of reference' across all cultures (Ratner, 2002). For instance, Triandis and Brislin (1984) highlighted that the same constructs can be understood differently in different cultural settings as 'there may be some identical aspects to a concept, but there will also be a culture specific meaning' (p.1009). If the items or constructs of the presumably universal measurements are understood differently in different cultural settings, they would not be measuring the same things that they set out to measure (Allwood & Berry, 2006; Segall et al., 1990). As a result, the reliability of their results can be highly questionable as the cultural difference obtained via such an approach may not reflect the true differences between patterns of mentalities and rationales occurring across societies. Another problem with the presumably universal measurements is how they were developed. Segall et al. (1990) argued that there is probably no such thing as a universally applicable theory or a culture-free measurement. According to them, even the most widely used and generally recognised 'universal' research concepts and measurements such as IQ tests are deeply intertwined with Western culture, especially American culture. Norenzayan and Heine (2005) also argued that Western theories and measurements are derived typically from Western researchers' observations of their own people, who are 'unusually individualistic, affluent, secular, low context, analytic, and self-enhancing with respect to the rest of the world' (p.765). They suggest that this view represents a 'cultural anomaly', as it is 'far from being typical of the world' (p.765).

In addition to measurement issues, the language barrier, or 'lost in

translation', is another methodological problem commonly faced by cross-cultural researchers. Researchers often find it difficult to translate concepts and research instruments (e.g. experiments and questionnaires), which are originally developed in English by Western researchers, into other languages without altering the original wordings because direct translation may not be possible or it does not make sense to do so (Triandis & Brislin, 1984). Schaffer and Riordan (2003) determined that the use of back translation cannot guarantee semantic equivalence because when researchers alter the original wording during translation, they may also change the meaning of the items, and thus reduce the validity of the measurement.

Moreover, besides measurement and language barriers, researchers also have raised questions regarding sampling issues of cross-cultural comparative studies. Large-scale multinational comparative studies have been criticised for using inadequate and unrepresentative samples (Norenzayan & Heine, 2005; Segall et al., 1990; Triandis & Brislin, 1984). For instance, Triandis (2004) criticised the researchers of the GLOBE study (House et al., 2004), which is a replication of Hostede's (1980) study carried out across 62 societies, for using too few samples to represent vast and heterogeneous countries such as the USA and China. Both Segall et al. (1990) and Norenzayan and Heine (2005) explained that this is mainly because cross-cultural researchers often settle for what is available and accessible instead of making use of truly representative and comparable samples, since it is virtually impossible to obtain equivalent and comparable samples from more than one society. Even if empirically representative samples across different societies could be found,

researchers may not be able or afford to do so, as it would require a substantial sum of funding and manpower to achieve the empirical representativeness of the samples.

Clearly, the cross-cultural comparative approach, which typically involves imposing Western developed measurements on different cultural groups, is not an ideal means for exploring sociocultural phenomena — at least judging from its filtered theoretical lens, its focus on comparative purposes and positivistic-oriented methodologies. The next section will review indigenous psychology as an alternative to the cross-cultural and mainstream perspectives.

2.3 Indigenous Psychology: A Cultural Insider Perspective

In the two past decades, the indigenous psychology movement has flourished in Taiwan (e.g. B.-S. Cheng, 2005a; C.-F. Yang, 2005a; K.-S. Yang, 1997b), Korea (e.g. S.-C. Choi, Kim, & Choo, 1993; Kim & Park, 2006a; Kim et al., 1999), Mexico (e.g. Diaz-Loving, 1999), India (e.g. Sinha, 1997) and beyond. There are two possible driving forces behind the rise of indigenous psychology in these countries. First, as these economies expand rapidly, there are increasing needs for more culturally-relevant and useful management and social science theories for their people (B.-S. Cheng, Lin, & Chou, 2009). Taking Taiwan as an example, the country's government has been funding local scholars to develop indigenous management and psychological theories while encouraging collaboration between academia and industries in an attempt to boost productivity and incubate innovation (J. S. Lee & Wang, 2003; Liou, 2010). The idea is that using an indigenous perspective to investigate local issues, problems, and

phenomena may help Taiwanese researchers and practitioners to gain better understandings of what is going on, how people actually work, and tackle common problems found in their workplace. The 'tailor-made localised theories' (i.e. knowing what works and what does not work when it comes to managing their people) developed through this approach may be highly beneficial for practitioners to enhance corporate success or even the performance of the economy as a whole. Second, K-K. Hwang (2005b) suggested that 'anticolonialism' is what drives the development of indigenous psychology in Taiwan as local researchers opt to adopt an indigenous perspective to resist the colonisation of Western views on Taiwanese scientific communities. Researchers in Pacific Asia (e.g. Azuma, 1984; Kim, 2000; K.-S. Yang, 1997b) are increasingly aware that the adoption of Western views may obstruct in-depth understanding of their own people as researchers have to conform with universalism and positivistic paradigm by using Western concepts as theoretical constructs and eliminating culture, context and local knowledge from their research design. In response to this problem, prominent Asian psychologists like K-S. Yang (1993, 1997a), Ho (1988, 1998) and Kim (2000) have initiated an indigenous psychology movement to encourage fellow researchers to adopt a cultural-insider perspective as an alternative to the presumably universal Western views. Instead of seeing sociocultural phenomena through a filtered Western lens, the indigenous psychology perspective encourages researchers to see issues from a cultural-insider perspective by paying attention to what matters for cultural insiders, while taking their natural contexts into account.

2.3.1 Definition of Indigenous Psychology

Indigenous psychology is not just studies of 'exotic people' or 'native people' – it represents 'the study of human behaviour and mental processes within a cultural context that relies on values, concepts, belief systems, methodologies, and other resources indigenous to the specific ethnic or cultural group under investigation' (Ho, 1998, p.93). It is designed to enable researchers, especially non-Westerners, to obtain a better understanding of the true psychology of their own people and to tailor culturally relevant and appropriate explanations (Kim et al., 2006b). Some researchers (e.g. Cole, 1996; Diaz-Loving, 1999; Stigler, Shweder, & Herdt, 1990) have used the terms 'ethnopsychology' and 'indigenous psychology' interchangeably because an indigenous psychological theory is usually developed for a specific ethnic group.

2.3.2 Indigenous Psychology's Underlying Theoretical Propositions

In comparison with cross-cultural psychologists, indigenous psychologists in general adopt very different theoretical propositions, especially in terms of (a) their perceptions of culture, (b) their emic/cultural-insider perspective, and (c) their attitudes towards universality.

First, indigenous psychologists perceive culture in a fluid and dynamic manner (Kim & Park, 2006b) which is in sharp contrast with most cross-cultural psychologists' view of culture as a static independent variable (Hofstede, 1980; Hofstede & Bond, 1988). For instance, Kim (2000) has defined culture as an 'emerging property of individual and

groups interacting with their nature and human' which enables us 'to define who we are, what is meaningful, communicate with others and manage our physical and social environment' (p.270). Or according to Diaz-Loving (1999), culture or socio-culture is:

'...a system of interrelated premises (norms, roles, etc.) that governs feelings and ideas, and that stipulates the hierarchy of interpersonal relations, the types of roles to be fulfilled, and the rules for the interaction of individuals in such roles: where, when, with whom, and how to play them. In this fashion, social behaviour is directed and determined by the extent to which each subject believes, adheres, addresses, and internalises his/her cultural dictates' (p. 437).

In short, indigenous psychologists generally perceive culture as an entity which is deeply intertwined with context, social activities, artefacts and meanings. Therefore, they believe that culture and sociocultural phenomena should be understood in both context (e.g. circumstances and environment) and content (e.g. meaning, values and beliefs) (Greenfield, 2000; Kim et al., 2006b).

Second, indigenous psychologists typically employ the emic approach, which is very different from the imposed etic approach used in most cross-cultural comparative studies. Indigenous psychologists are interested in gaining in-depth understandings of their own people, so they are against the idea of imposing foreign concepts and measurements (e.g. mainstream Western views) (Kim et al., 2000). For the sake of developing culturally relevant 'local theories', they usually adopt the emic approach, which allows them to employ local knowledge, subjective meanings, and native sociocultural context as the sources of understanding (Berry, 1989;

Morris et al., 1999). Researchers acknowledge their positions as well-informed cultural insiders who 'know the culture, speak the language, and understand the cultural practices in this particular setting' and utilise their wealth of insider knowledge as an important analytical tool to interpret data and to 'detect subtle cues in the behaviour of the subjects' (Segall et al., 1990, p.52-53). Therefore, indigenous psychology studies are usually carried out in the researcher's home country where they have good knowledge about the culture (Adair, 1999).

Although indigenous psychology places great emphasis on using native/local knowledge as the source of understanding while using a cultural-insider perspective to interpret meanings, it does not mean that they totally disregard mainstream theories and concepts developed in the West. In fact, it would be virtually impossible and unwise to do so because the main body of social science is developed by Western researchers (Adair, 1999; Kim et al., 1999). However, indigenous psychologists are in dispute over the role of mainstream psychology literature and the use of Western-developed concepts in indigenous psychology research. On one hand, prominent indigenous psychologists like Kim and colleagues (Kim, 2000; Kim et al., 2000; Kim & Park, 2006a) and Enriquez (1993) have suggested that researchers can employ Western-developed mainstream theories and concepts to explain the psychology of a non-Western cultural group. They can do so by 'modifying' these Western theories to make them 'fit' for explaining the psychological states of a specific (typically non-Western) cultural group. This process is known as 'indigenisation' or the 'indigenisation from without approach' (Adair, 1999).

On the other hand, other leading indigenous psychologists like K-S.

Yang (2001) have opposed the use of this 'indigenous from without approach', which according to him is not much different from the imposed-etic approach commonly used in cross-cultural psychology and mainstream psychology. This is because by adopting Western theories and concepts, researchers also adopt their underlying theoretical assumptions, such as universalism, which may lead to problems like ethnocentrism. Given that indigenous psychology's core theoretical proposition is to understand people in their own context and in their own terms, this 'indigenous from without approach' clearly is a deviation from its core proposition. Therefore, Yang (2001) argued that indigenous psychology theories should be developed by using native knowledge and cultural-insiders' perspectives, not via testing 'modified' Western perspectives/theories.

Nevertheless, Western-developed theories or findings can still provide valuable insights for indigenous psychologists. Knowing how things work in other cultural settings may help researchers to reflect on how things stand in their own culture, or to draw comparisons. In this study, mainstream/Western theories and concepts provided important directions and references, but their meanings and implications were explored rather than directly applied or tested on the research participants. For example, Western researchers have associated conformity pressure with the effects of majority influence (De Dreu & West, 2001; Moscovici, 1976) as well as legitimate and reward power (Prendergast, 1993). The researcher's knowledge about these exiting findings did help to guide the research participants to reflect and explore their own experience about why and how they conform with co-workers and relevant-others (e.g. clients and

suppliers) when working in CFB R&D teams.

Third, indigenous psychologists also have a very different attitude towards universality as compared to cross-cultural psychologists. Although indigenous psychologists believe that it is possible to uncover universality in the human psyche, they argue that universality should be grounded in empirical data and derived by comparing the results of indigenous psychology studies on all ethnic groups, rather than assumed a priori (Kim, 2000; Kim et al., 2000; Poortinga, 1999; Segall et al., 1990). The universality uncovered via conducting parallel indigenous research across different societies is considered 'derived-etic', otherwise, known as the 'derived etic approach' (Berry, 2000; Enriquez, 1993). According to C-F. Yang (2005b), even though indigenous psychologists acknowledge the possibility of universality in the human psyche, they are not interested in pursuing this elusive universality. Instead, they are more concerned about gaining a better understanding of the true psychology of their own people.

Based on these theoretical propositions, indigenous psychology is arguably a more suitable approach for exploring the true psychology of non-Westerners as compared to mainstream or cross-cultural comparative approaches. Even though the indigenous psychology perspective is great for in-depth exploration of how things work in a specific non-Western context, this approach is not without limitations. First, its focus on a specific context means that the findings may have very limited generalisability. Ho (1988) suggested that the indigenous psychology perspective may be a type of 'ethnocentrism in reverse', as the findings are only applicable to one specific cultural group. Nonetheless, others (K.-K. Hwang, 2005b; Pe-Pua, 2006) have argued that indigenous psychology

studies can function like stepping stones or the foundations for uncovering true universality or 'derived-etic' in the human psyche by comparing results of indigenous psychology studies carried out in different cultural settings. Second, another limitation of the indigenous psychology is that researchers may find it difficult to publish their papers in top-tier mainstream academic journals (Adair, 1999; Leung, 2007, 2009). For instance, Leung (2009) noted that 'most reviewers of mainstream English language journals are lukewarm about these types of research because of the reviewers' emphasis on theory and the concomitant suspicion of novel ideas and inductive research (p.217). Adair (1999) also suggested that this is a common dilemma for indigenous psychologists who face pressure to conform to the mainstream perspectives if they want to gain recognition from wider scientific audiences (e.g. mainstream scholars). Nevertheless, non-Western researchers should not be deterred by these limitations in the indigenous psychology perspective as the benefits (e.g. gaining in-depth understandings of how things stand in their home countries and why they are the way they are) may outweigh the shortcomings.

The next section explains the rationales for using Chinese indigenous psychology, which is a branch of indigenous psychology developed by researchers in Taiwan and Hong Kong, as the theoretical lens for this study.

2.3.3 Chinese Indigenous Psychology as the Theoretical Lens

Like other non-Western researchers, Taiwanese or Chinese researchers in general also face pressure to conform with the mainstream approach and Western views, especially if they want to communicate their findings to a wider audience via publication, or if they desire recognition

from mainstream researchers (Adair, 1999; Leung, 2009; K.-S. Yang, 1997a). Adair (1999) also pointed out that as non-Western researchers 'over-learned Western psychology and methodology' through their academic training, they are often more eager to test Western concepts on their people than exploring their true psychology. Yang (1997a) suggested that in the past few decades such a predilection to adopt and conform to mainstream Western views among Taiwanese and Chinese researchers has led to the build-up of 'Westernised Chinese psychology theories', which are essentially replications of Western theories on Chinese/Taiwanese subjects. Take existing Taiwanese team research as an example, most team research on Taiwanese or Chinese teams simply tested Western concepts and measurement on Taiwanese or Chinese subjects (e.g. T. J. Chang, Hu, & White, 2004; J.-w. Cheng & Liao, 2001; Jia-Chi. Huang & Hsu, 2006; Jia-Chi Huang & Huang, 2006; Jia-Chi. Huang & Tsai, 2003; C.-T. Tsai & Kao, 2004; Tu & Chang, 2006). For instance, Huang and Huang (2006) employed various Western-developed measurements to investigate the effects of team members' goal orientation on team efficacy in Taiwanese R&D teams. Another example is Tjosvold and Yu's (2004) work on how teams' cooperative, competitive, and independent goals affect teams' in-role and extra-role (organisational citizenship behaviour) performance in Chinese settings. The authors used mainstream cooperation and competition theories which are dominated by Western views as theoretical lenses to develop hypotheses and tested a combination of Western measurements and some indigenous measurements developed by Taiwanese researchers (e.g. organisational citizenship behaviour measurement by Farh, Earley, & Lin, 1997) on Chinese subjects. They

argued that their results indicate that Western concepts and theories can be valid for exploring team dynamics in the Chinese context. According to Yang (1997a), such 'Westernised Chinese psychological studies' provide very limited utility for 'explaining, predicting and understanding' the behaviours or the true psychology of Chinese people because they have failed to take Chinese peoples' culture and sociocultural context into consideration' (p.65). Based on frustration towards such 'Westernised Chinese psychology research', he initiated the movement of indigenous Chinese psychology. (The word 'Chinese' in the term of Chinese indigenous psychology implies ethnicity rather than nationality).

According to K-S. Yang (1993), Chinese indigenous psychology is 'an evolving system of knowledge about the psychological and behavioural functioning of the Chinese people that has been built up by utilizing an indigenous or indigenized research strategy or paradigm' (p.71). Its main objective is to tailor culturally relevant, appropriate, and useful psychological theories to explain and predict the psychology and behaviours of the Chinese people (B.-S. Cheng, Wang, & Huang, 2008; C.-F. Yang, 2005b). According to C-F. Yang (2001), the development of an indigenous theory can be divided into six key steps:

Step 1: 'Use empirical observation of the psychology and the behaviour of Chinese people as a research topic'.

Step 2: 'Adopt thinking patterns or experience of Chinese people as the source of a research concept'.

Step 3: 'Incorporate social-culture systems and factors (e.g. language, meaning systems) into the research design and conceptual framework'.

Step 4: 'Then, develop an appropriate research design and measurement tools for Chinese people'.

Step 5: 'Develop theories and behaviour models to explain the psychology and behaviour of Chinese people by using high indigenous awareness and high indigenous compatible research design'.

Step 6: 'Thus, lead to the generation of a Chinese psychological knowledge system for Chinese people based on these theories and behaviour models' (Chung-Fang Yang, 2001, p. 122).

Unlike the imposed-etic approach, in which researchers are expected to conform to dominant Western views, C-F. Yang's approach encourages them to employ indigenous knowledge, issues relevant to the Chinese people and the local frame of reference. Undoubtedly, this cultural-insider perspective is a more culturally-appropriate angle for investigating teamworking in CFBs because it allows the researcher to understand teamworking through the eyes of those actually work in CFB teams and consider issues that really matter to them. Via this approach, CFBs' organisational contexts and the wider sociocultural contexts (e.g. cultural values) can be incorporated into the research design to enable a more holistic understanding. As many researchers (Guzzo & Dickson, 1996; Ilgen et al., 2005) pointed out that, in organisations, teams do not exist in isolation as the two have a dynamic coupling relationship. Therefore, for those who work in CFB teams, their organisational contexts and their sociocultural contexts are likely to have influential effects on how work and innovate in teams.

2.3.4 Examples of Chinese Indigenous Team Studies

In the past two decades, the numbers of indigenous theories developed by Taiwanese and Chinese researchers have risen, as more and

more researchers take on the cultural insider perspective to study their own people (S. X. Chen, 2010; Leung, 2009). However, there is only a handful of Chinese team/group research which has taken indigenous/emic concepts as key theoretical constructs. For instance, researchers have explored the effects of Guanxi which is 'a particular kind of interpersonal relationships or connection that serves as a form of social currency' (Tsui, Farh, & Xin, 2000, p.225), as well as the effects of paternalistic leadership on Taiwanese teams. In terms of the effects of Guanxi, Lee, Chang and Lin (2009) pointed out that Guanxi networks are a distinctive feature, which underlie Taiwanese firms' success. This is because they function like a social capital, which individuals and firms can use reciprocal obligation and trust to exchange for favours and informal influences outside the domain of the original social ties (p.568). Given the importance of the Guanxi networks for Taiwanese firms, Chou, Cheng, Huang and Cheng (2006) explored how different types of Guanxi network affect trust and team effectiveness. They found that the Guanxi networks do not always have positive effects on team effectiveness. On the upside, intra-team Guanxi may promote both cognitive and affective trust, and thus help to enhance individual and team effectiveness. On the flip side, they also found that 'when Guanxi is established in situations where collaboration is not emphasized, or when there is competition of resources, such as in many intradepartmental relationships, it will hinder teammates' affective outcomes' (e.g. trust) (Chou et al., 2006, p.92). In a more recent study, M-H. Chen (2009) investigated how Guanxi affect creative performance in Taiwanese NPD teams. He found that Guanxi networks, especially intra-team Guanxi networks, are important facilitators of team creativity

because they lay the foundations for trust and close interpersonal interactions.

In addition to studies on Guanxi, Taiwanese researchers have also investigated effects of paternalistic leadership on Chinese teams. Cheng and colleagues argued that under the influence of Chinese culture, Chinese leaders in general adopt a unique paternalistic leadership style which is very different from the Western leadership styles (B.-S. Cheng, 1995c; B.-S. Cheng, Chou, & Farh, 2000; Farh & Cheng, 2000b). According to Farh and Cheng (2000b), paternalistic leadership can be defined as 'a father-like leadership style in which clear and strong authority is combined with concern and considerateness and elements of moral leadership' (p.85). This unique leadership style has three key elements: authoritarian, benevolent, and moral leadership behaviours. Each of these dimensions reflects the influence of a set of cultural values (Farh & Cheng, 2000b). Authoritarian leadership behaviours, which are shaped by traditional patriarchal values and feudal legalism, are the most distinctive traits of paternalistic leadership (Wu, Chou, & Cheng, 2008). Tight control over power and information, a tendency to undermine subordinates' contribution, and dictatorial decision-making style are typical examples of authoritarian leadership behaviours. Moreover, benevolent leadership behaviours (e.g. tentative to subordinates' needs and provide support) are used by Chinese leaders to bond with subordinates and that these behaviours are shaped by Confucian familial values (H.-Y. Chen, Kao, & Wu, 2007). Furthermore, Chinese leaders use morale leadership behaviours (e.g. setting good examples and showing integrity) to assert influences and that such behaviours are influenced by Confucian values on rules of

propriety (Farh & Cheng, 2000a; Niu, Wang, & Cheng, 2009).

In the past decade, Farh and Cheng's (2000a; 2000b) work has inspired a few handfuls of subsequent studies to develop measurements for paternalistic leadership (e.g. B.-S. Cheng et al., 2000; B.-S. Cheng et al., 2010) or explored paternalistic leadership's impact on subordinate effectiveness and wellbeing (H.-Y. Chen et al., 2007; e.g. Ioannidis, 2005). In addition to measurements, a number of studies have explored the effects of paternalistic leadership on team dynamics. For instance, Chen, Tsai and Cheng (2005) and I-M. Tsai (2005) found that among the three dimensions of paternalistic leadership, authoritarian leadership behaviours are associated with higher turnover intention and lower group satisfaction in teenage sports teams. In contrast, morale and benevolent leadership behaviours can have more positive effects on group satisfaction.

Judging from these indigenous Chinese team studies, it is clear that there are cultural specific elements (e.g. Guanxi and a paternalistic leadership style) that can affect how Chinese teams work. Yet, no comprehensive exploratory study has been carried out to explore the dynamics of Chinese teams or to investigate how the contexts of Chinese teams affect the way they work. This study attempts to address this issue by exploring how teams work in the context of CFBs and how these teams' contexts affect how they work and innovate.

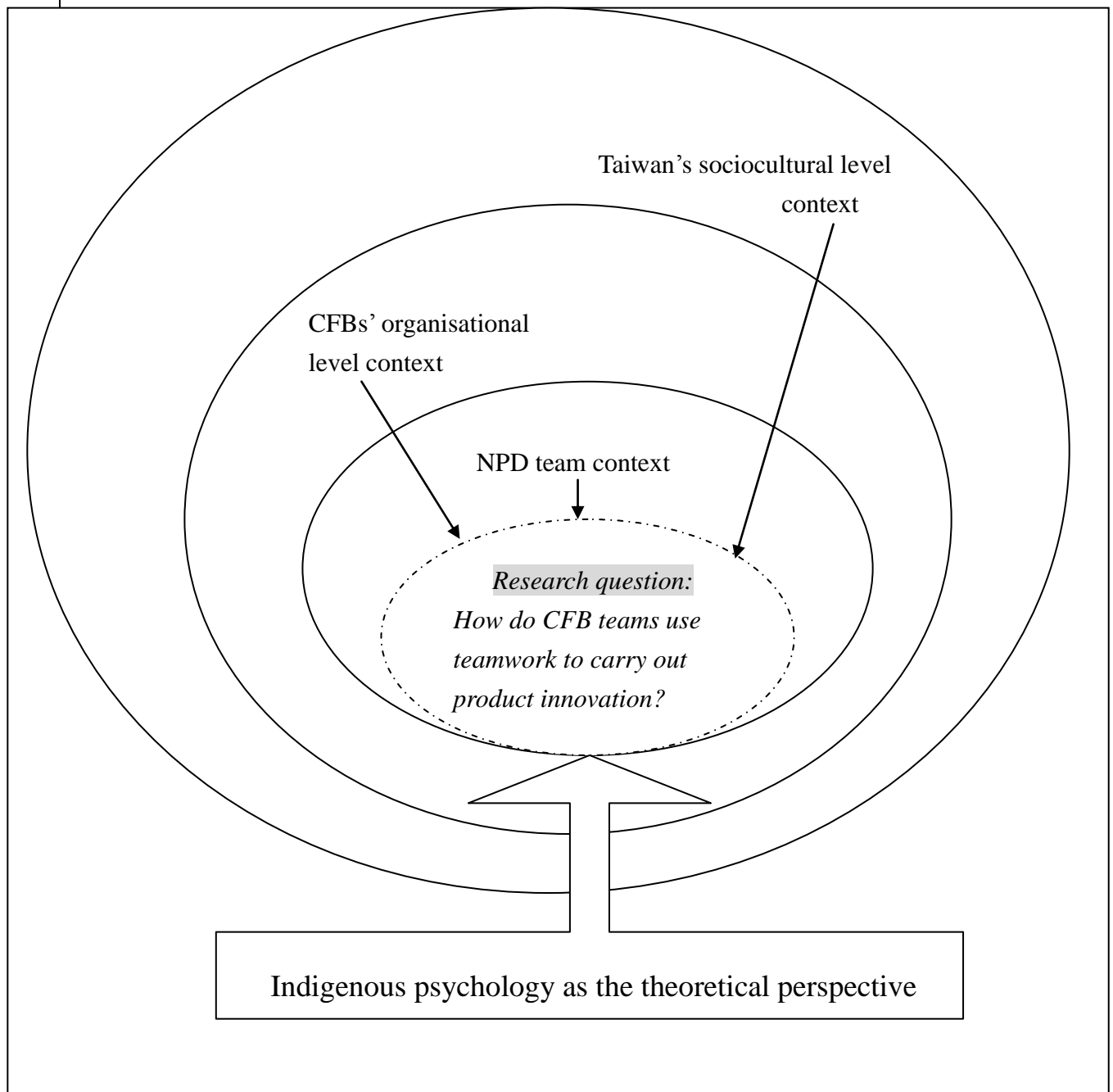
2.4 Theoretical Framework

As explained earlier, I used indigenous psychology as the theoretical lens for this study because I want to explore how CFB teams work and innovate and then understand why they work the way they do from a

cultural insider perspective. In a way, indigenous psychology's emphasis on understanding people in context is somehow similar to an ecological view employed by some team researchers (e.g. N. J. Cooke, Gorman, & Rowe, 2009; Stokols, Misra, Moser, Hall, & Taylor, 2008; Sundstrom et al., 1990). From an ecological viewpoint, researchers see sociocultural phenomena as dynamic systems in which individuals constantly interact with their environments and construct thoughts and behaviours accordingly (N. J. Cooke et al., 2009). In the case of teamworking, teams have interactive, independent relationships with their work contexts as they co-exist with their organisations and have to collaborate with other parties within their firm for the sake of collective objectives (e.g. profitability of their firms) (Ehrhart & Naumann, 2004). Furthermore, teams and organisations do not exist in isolation, as they are embedded in a wider sociocultural environment, and that these different aspects of team context can have interrelated relationship (Courtney et al., 2007). Through this ecological perspective, I want to explore how CFB teams work and innovate in context by taking three levels of their context into account: team level, organisational level, and sociocultural level contexts. As illustrated in the theoretical framework shown in Figure 2.1, these different levels of context can all have effects on how CFB teams work because team members have to interact with these aspects of the context on a daily basis. The outer circle represents Taiwan's sociocultural contexts, such as sociocultural norms. Researchers (Wah, 2001; Weidenbaum, 1996) have found that Confucian familial values such as emphasis on social hierarchy and interpersonal harmony have influential effects on how CFBs are governed and on Chinese people's workplace behaviours. The next circle is

CFBs' organisational contexts given that according to Doolen et al. (2006), organisational contexts, such as company policy and resources, can have influential effects on how teams work and on their effectiveness. The centre circle represents the focus of the study: how CFB teams use teamwork to carry out product innovation. This issue is understood in team's immediate team-level contexts as well as the organisational and wider sociocultural level contexts in which they are embedded. By using an indigenous psychology perspective as the theoretical lens, I use indigenous concepts, cultural insider's knowledge and feelings, and the characteristics and effects of the teams' context as sources of understanding. Such cultural-specific knowledge is vital for gaining a better and more accurate understanding of how CFB teams work and why they work in this particular manner.

Figure 2.1: Theoretical framework – exploring how CFB team work in context via an indigenous psychology perspective



2.5 Chapter Summary

In this chapter, I have reviewed existing studies on teams from three different theoretical perspectives: the mainstream Western perspective, a

cross-cultural comparative approach, and an indigenous psychology perspective. Even though the mainstream team research provides a valuable insight into how teams work and innovate, this perspective may not be suitable for exploring CFB teams work and innovate for two reasons. First, under the influence of universalism that underlies mainstream team research, researchers often assume that findings obtained in Western settings are universally applicable (Norenzayan & Heine, 2005). However, cross-cultural researchers and indigenous psychologists have found empirical evidence to indicate that teams do work differently in different cultural settings (M. H. Bond & P. B. Smith, 1996; G. Chen et al., 2011; J.-S. Chen, 2001). Second, under the influence of positivistic paradigm and postmodernism, which prevail in mainstream team research, researchers generally eliminate culture and context to prevent contamination in order to obtain 'absolute' statistical correlations in their hypotheses-testing studies (Kim, 2000; White & Wang, 1995). This theoretical proposition has led to a build-up of decontextualised team studies (e.g. experimental studies on mock student groups) in the team literature (Engestrom, 2008; Salas & Wildman, 2009). Yet, researchers have found that team context, such as team level context, organisational settings, and sociocultural norms, can have influential effects on how teams work and how well they work (Doolen et al., 2003; Gelfand et al., 2007). Given that the mainstream team research is dominated by Western views and decontextualised hypotheses-testing type of studies, the mainstream approach may not be suitable for exploring how CFB teams work and innovate.

In addition to mainstream team research which is mainly developed in the West, there are also cross-cultural comparative team studies. Unlike

mainstream team research which typically excludes culture and context (Engestrom, 2008), culture or dimensions of culture are considered as an important independent variables or mediators in cross-cultural comparative team research (M. H. Bond & P. B. Smith, 1996; Gelfand et al., 2007). For instance, individualism and collectivism have been found as a key cultural antecedents or the 'cause' behind different team work patterns observed across different cultural groups. Researchers have found that collectivists (e.g. the Chinese) are more likely to work harder (Earley, 1993), conform more (R. Bond & P. B. Smith, 1996), and are more concerned about collective goals and hierarchical status (Tinsley & Brett, 2001) as compared to individualists (e.g. Americans). Even though cross-cultural team studies provide comparative views of how teams work differently across selected cultural groups, this perspective may not be suitable for exploring teamworking in the unique context of CFBs for following reasons. First, the cross-cultural comparative approach is designed to enable researchers to transport existing theoretical concepts and measurements which have been mainly developed in the West to other cultural settings to test their validity and to measure cultural differences (Berry, 2000; Berry et al., 2002). In other words, this approach is meant for comparing levels of differences of certain phenomena in selected cultural groups (e.g. Western versus non-Western settings) rather than for the in-depth exploration of a specific non-Western setting. Second, researchers have debated the validity and reliability of cultural differences observed via the imposed-etic approach due to its conceptual issues (e.g. lack of universal share of reference) and operational problems (e.g. inadequate samples and lost translation) (Schaffer & Riordan, 2003; Segall et al., 1990; Triandis & Brislin, 1984).

Finally, the findings of cross-cultural comparative studies have been criticised as 'merely descriptive' as they only give descriptions of levels of differences across selected cultural groups instead of explaining the complex mechanisms that cause such differences (Ratner, 1997, 2002; C.-F. Yang, 1996).

As an alternative to these two theoretical perspectives, I adopt a Chinese indigenous psychology perspective as the theoretical lens. There are two reasons for using this approach instead of the popular mainstream approach or the cross-cultural approach. First, the Chinese indigenous psychology perspective allows researchers to employ local knowledge, cultural insiders' subjective experience and feelings, and the Chinese frame of reference as the main sources of understanding. As this study seeks to understand how CFB teams work from a cultural insider's point of view, this theoretical lens is most appropriate. Second, this perspective also allows researchers to take the Chinese context (e.g. sociocultural norms and values) into account for the sake of achieving better understanding. Given that CFB teams do not work in isolation, it would be beneficial for the researcher to explore the effects of context on how they work and innovate.

Overall, I have explained the theoretical proposition underlying this study in this chapter. The next chapter will provide more information regarding the contexts of the study, including Taiwan's sociocultural context, CFBs' organisational traits, and the common characteristics of NPD teams.

Chapter 3 Research Context

3.0 Introduction

This research was carried out in family firms in Taiwan and this chapter provides details about the research context, which can be largely divided into three levels: societal, organisational, and team level context. The first part of the chapter reviews Taiwan's sociocultural context in brief. The second part gives a working definition of CFBs and discusses common characteristics of CFBs, such as ownership and corporate governance. The third part of the chapter gives descriptions of the key characteristics of R&D teams. Finally, this chapter concludes with a brief chapter summary.

3.1 Taiwan's Sociocultural Context

This research was carried out in Taiwan and this section will briefly review the country's economic and sociocultural background. As a small island located in Northeast Asia next to mainland China and Japan, Taiwan has a population of a mere 23 million people (Small and Medium Enterprise Administration, 2002, 2007). In the past six decades, Taiwan has evolved rapidly from a former colony of Holland, China and Japan into a modern, liberal, and democratic society (Farh, 1995). Although its legal status as an internationally recognised country is still a highly sensitive political controversy, Taiwan is an independent, sovereign state which has its own people-elected government, laws, citizens, and territory (Chan, 2009).

Hsieh and Hsing (2002) suggested that the country's huge leap in democracy has only been possible with the support of Taiwan's high

economic growth over the past five decades. Taiwan's economic growth rate in the past five decades has been among the world's highest, and its economy grew 10.8% in 2010, which is a much higher growth rate compared to the US and European nations (Business Monitor International, 2012; International Monetary Fund, 2011; Liang, 2010; Oxford Economic Country Briefings, 2010). As the domestic market is fairly small, Taiwan relies on its export-oriented manufacturing industries to sustain economic growth (T.-T. A. Huang et al., 2010). As a successful exporter, Taiwan manages to bring in huge trade surplus year after year (Economist, 2009; ViewsWire, 2010). After decades of accumulation, the nation now holds the world's fourth largest foreign reserve to the amount of more than 350 billion US dollars (Business Monitor International BMI, 2011; Shih & Wickramasekera, 2011). In addition to financial performance, Taiwan's economy is also considered highly competitive, so much so that it was ranked the eighth most competitive economy among 58 major economies in the world in 2010 (The International Institute For Management Development IMD, 2010).

The reasons behind Taiwan's outstanding economic achievements are complex and multifaceted. Government policies, such as continual investment and improvement in education, technology and infrastructure, incubating competitive export-oriented manufacturing industries (e.g. IT, high tech, electronic industry), and tax incentives for innovation, are all important driving forces behind Taiwan's economic success (T.-J. Chen & Tang, 1990; Chuang, 1996; K.-H. Tsai & Wang, 2004; J.-C. Wang & Tsai, 2005; Yoshida, 2001). Under the influence of these policies, Taiwan is in transition from an OEM kingdom, which relies heavily on labour-intensive value-adding activities, towards a leading knowledge- and innovation-driven

economy in the Pacific-Asia region (W.-w. Chu, 2009; Economist, 2005; J.-Y. Hsu, 2010; C.-Y. Hwang, 1995; Shyu & Chiu, 2002). For instance, Liou (2010) stated that Taiwan's government policies on incubating innovation are perhaps the most important reasons why Taiwan's high-tech and IT industries (e.g. computer component and semiconductor) are 'at the top of the world market'.

Besides government policies, researchers have argued that Confucianism is another key factor which contributes significantly to Taiwan's economic success (Hofstede & Bond, 1988; Liang, 2010; Whyte, 1996). Although Kim and colleagues (Kim, 2000; Kim et al., 1999) urged researchers not to equate Confucianism with Chinese culture or to link Chinese people as followers of Confucianism because Confucian ideologies, which were developed thousands years ago, are out of date and out of context, many researchers still believe Confucianism still has significant influences on how contemporary Chinese think, behave and work (Defoort, 2001; Gabrenya & Hwang, 1996; P. K. Ip, 2009; Jacobs, Guopei, & Herbig, 1995; Warner, 2010; Yan & Soreson, 2006; Y. B. Zhang, Lin, Nonaka, & Beom, 2005). Familism, an emphasis on hierarchy, and the pursuit of interpersonal harmony are widely considered as the most influential Confucian ideologies in relation to economic growth and corporate governance in Taiwan and in other Chinese societies (Bond, 1991; P. K. Ip, 2009; Jacobs et al., 1995; Ku, 1999; L. H. Lin & Ho, 2009; Yan & Soreson, 2004; Yan & Soreson, 2006).

First, although the basic unit of Taiwan's society has changed from predominantly large family clans to small core families and individuals, traditional familial values still have a significant influence (K.-K. Hwang,

1996). For instance, under the influence of Confucian family values, Taiwanese people are still widely encouraged and sometimes pressurised to work hard to bring prosperity to their family, or to sacrifice individual gain to fulfil familial role obligations (e.g. filial duty, parenting duty) (C.-N. Chen, 1988; K.-S. Yang, 2005a). As a result, these familial values have led to robust entrepreneurship behaviours undertaken by local families in Taiwan, where the private sector is dominated by family firms (Fukuyama, 1995; Hamilton et al., 1990; Whyte, 1996; Yen, 1994a). In addition to promote entrepreneurship behaviours, familial values may have also attributed to CFBs' high productivity and corporate success (Hsiung, 1996). For instance, under the influence of traditional familial values, Taiwanese workers generally work diligently and are willing to scarce individual gains for the collective good of their firms (e.g. work overtime on a regular basis to cope with hefty workloads) (Hsiung, 1996; K.-K. Hwang, 1999; Macaulay, 1986; Shapiro, Gedajlovic, & Erdener, 2003).

Second, the emphasis on social hierarchy as a prominent societal value is another important cultural antecedent underling the success of Taiwanese firms and individual entrepreneurs (Kao, Sinha, & Wilpert, 1999; Macaulay, 1986; Shieh, 1993). Unlike individualistic Western societies, where individuals are perceived as equal, Taiwanese people are encouraged to pay attention to their relative hierarchical status and act accordingly (Ho, 1993; Westwood, 1997; K.-S. Yang, 2005a). For instance, leaders or parents are generally given unchallenged status to legitimise leadership control; in contrast, subordinates or children are encouraged or pressurised to respect leaders' or parents' authority by behaving in a submissive manner (C.-N. Chen, 1988; P. Chen, 2004; B.-S. Cheng, 1993; Hsiung, 1996; U.-S. Ju,

1993). Like familial values, which are attributed to thriving familial entrepreneurship, the cultural emphasis on a relative social hierarchy also functions like an implicit driving force behind robust entrepreneurial activities in Taiwan. Researchers have described Taiwan as a 'boss island', where many workers strive to set up their own businesses because they want to enjoy the glory and superiority that come with being a successful business owner (J.-S. Chen, 2001; Hsiung, 1996; Macaulay, 1986; Shieh, 1993; T. F.-L. Yu, 2009).

Third, sociocultural norms related to interpersonal relationships such as emphasis on interpersonal harmony, Guanxi, and social networking also have significant influences on the corporate governance of Taiwanese firms and the workplace behaviours of Taiwanese labours. Unlike individualists Westerners who typically use unique individual traits to define themselves, Taiwan's people tend to define themselves based on their interpersonal relationships or in-group memberships and that researchers have described this tendency as 'interdependent self-constructs' or 'relational self-constructs' (Gao, Ting-Toomey, & Gudykunst, 1996; Markus & Kitayama, 1991; C.-F. Yang, 2006; K.-S. Yang, 2005a). Given that interpersonal relationships are vital references for self-identity, Taiwanese people are keen to manage harmonised interpersonal relationships with significant and relevant others (Ho, 1993; K.-K. Hwang, 2005a; Tsui et al., 2000; K.-S. Yang, 2005a). Under the influence of Confucian ideologies which place great emphasis on preserving interpersonal harmony, Taiwanese people are generally willing to suppress their true emotions, be attentive to significant others' feelings and needs, fulfil their role obligations, or sacrifice their individual desire for their family and relevant others in order to preserve

harmony in their social lives (Leung, Koch, & Lu, 2002; Yai, 1993; C.-F. Yang & Peng, 2005; Y. B. Zhang et al., 2005). This desire to manage harmonious interpersonal relationships is a key cultural antecedent of why Taiwanese firms and entrepreneurs are good at building long-term networks with business partners (K.-K. Hwang, 1996). Taiwanese managers or workers in general are keen on cultivating long-term "Guanxi", which is a type of reciprocal interpersonal relationships with others relevant to their work that their Guanxi can function as social capitals in exchange for trust and favours, or to access to information and resources (Chou et al., 2006; K.-K. Hwang, 2000; Tsui & Farh, 1997; Xin & Pearce, 1996). For most Taiwanese firms, their employees or managers' webs of Guanxi are the foundations of corporate competitiveness as their employees' close-knitted webs of interpersonal networks are vital for acquiring orders, reducing costs and risks, and managing collaboration with strategic alliances (J.-S. Chen, 1994; Fukuyama, 1995; Redding, 1995; ZoTing, 1998). Schlevogt (2002) described this tendency to cultivate interpersonal ties as a 'web-based management style', which is paramount to the success of Chinese family firms.

Judging from these examples, it is clear that these Confucian values not only are the cultural antecedents behind Taiwan's economic growth, but also they have significant influence over how the islanders work and live their lives.

3.2 Key Characteristics of Taiwanese Family Firms

The focus of this study is to explore teamworking innovation in Taiwanese family firms. Why family firms? Well, they are an important

existence for Taiwanese people for several reasons. First, most indigenous Taiwanese firms, both large and small, are controlled by local families (Fukuyama, 1995). Second, family firms have been important pillars of Taiwan's sustained economic growth over the past five decades and they employ estimated half of the country's workforce (Farh, 1995; K.-K. Hwang, 1988). Third, for many Taiwanese people who run family firms or who work for their families, family firms also represent a traditional lifestyle in which work life and family life are deeply intertwined and inseparable (M.-C. Chen, 1988; K.-S. Yang & Yeh, 2005).

In comparison with Western family firms, Taiwanese family firms as a type of CFBs have several distinctive traits. First, Western family firms are usually controlled by core/nuclear families (i.e. parents and children) (Rothausen, 1999). In contrast, CFBs are often controlled by large family clans or an entire extended family (i.e. a family unit including grandparents, parents, uncles, aunties, cousins, nieces, sisters- and brothers-in-law, etc.) (Hsiung, 1996; Schlevogt, 2002). Given that Chinese family firms are typically considered the private asset of the controlling family, a CFB's company assets and executive positions are usually divided and passed on to members of the controlling families as part of their inheritance deal (C.-N. Chen, 1988; K.-K. Hwang, 1988). As the family grow and more family members from the core/nuclear family (i.e. children, grandchildren) and the extended family (uncle, aunties, cousins, or nieces) join the firm, the business is passed on from one generation to the next over the course of time (B.-S. Cheng, 1995b).

Second, Western family firm owners generally use competences as the main criterion for selecting leaders and successors (Westwood, 1997). In

contrast, hierarchical ranking and familial inheritance rules often have far more potent influence on leadership and succession than competences in CFBs (Westwood, 1997; Yan & Soreson, 2006). For instance, Westwood (1997) noted that a leader in the Chinese context 'is born into a headship position and is thereby expected to display leadership by virtue of that background and position' and his authority is secured via 'extant structural arrangement' instead of followers' recognition or his contribution (p.462). Under the influence of patriarchal values, the eldest son of the founder is usually chosen as the next generation chief executive officer (CEO) and is given dominating control over the family firm, regardless of whether or not he is competent enough or willing to take on the responsibility (Bertrand & Schoar, 2006; M.-C. Chen, 1988; W.-C. Chen, 2002).

Third, CFBs often are extensively networked with strategic alliances (e.g. suppliers and clients) in regional industrial clusters and have good political connections. Their networking skills are one of their most important competences which Western competitors find it hard to imitate (Carney, 1998; D. Ip, 2000; H. M. Lin, 2004; Redding, 1995; Weidenbaum & Hughes, 1996).

Overall, these comparisons provide several snapshots of CFBs in a comparative view. The following sections will give more in-depth details about CFBs' organisational traits.

3.2.1 Defining a Chinese Family Business

Although the importance of CFBs is widely acknowledged, a clear definition is pretty much absent. This is probably because researchers are divided over the definition of family firms, especially in terms of using private

ownership or ownership control as an essential criterion to define a company as a family firm (Abdellatif, Amann, & Jaussaud, 2010; Chrisman, Chua, Pearson, & Barnett, 2010; Dyer, 2006; Neubauer & Lank, 1998; Westhead & Cowling, 1998). On the one hand, some researchers argue that the controlling family's 'kith and kin' involvement is the key criterion for defining a family firm because the controlling family's domination is what makes family firms stand out from other types of commercial organisation (Cadbury, 2000; J.H. Chua, Chrisman, & Sharma, 1999; Daily & Dollinger, 1992). For example, Chua, Chrisman and Steier (2003) suggested that as long as a company is managed and controlled by a family, then this company can be categorised as a family firm, regardless of whether or not the controlling family has private ownership or ownership control. They stated:

'The family business is a business governed and/or managed with intentions to shape and pursue the vision of the business held by a dominant coalition controlled by members of the same family or a small number of families in a manner that is potentially sustainable across generations of the family or families.' (J.H. Chua et al., 1999, p.25)

On the other hand, other researchers (Bertrand & Schoar, 2006; Dreux, 1990; Goffee, 1996) argue that a firm can only be categorised as a family firm if the controlling family have both management control and ownership control (i.e. they must own more than 50% of the shares).

Based on these two arguments, two approaches can be used to define a Chinese family firm. Broadly speaking, as long as a firm that is founded and controlled by an indigenous Chinese family, it can be considered a Chinese family firm. This description is most suitable for describing large, stock

market-listed and family-controlled firms in Chinese societies like Taiwan and Hong Kong, where many large public companies are founded and still controlled by local families without ownership control (Ding, Zhang, & Zhang, 2008; Erdener & Shapiro, 2005; Fukuyama, 1995). Given the clear separation of ownership and control in large listed companies, the founding families of large CFBs can secure control by preserving strategic positions for family members or through complex cross-shareholding deals (Y. Liu, Ahlstrom, & Yeh, 2006). Therefore, ownership control may not be a necessary criterion for defining large family-run firms.

Alternatively, if we take a more narrow view and ownership into consideration, there are three key criteria for defining a Chinese firm as a CFB. First, a firm managed by a controlling family, which has at least three family members involved in day-to-day management. These family members must hold top executive positions such as CEO, chairman, etc., have dominant control of the firm and intend to sustain their control on a long-term basis. Second, the controlling family and its members must have private ownership or ownership control. And third, the family owners and their family firm must be indigenous to a Chinese society such as Taiwan, Singapore or Hong-Kong.

This narrow description is a typical depiction of small and medium-sized CFBs in Taiwan, where most SMEs are privately owned and managed by local families (Chow, 2004; W.-w. Chu, 2009; K.-K. Hwang, 1996; Pong, 1989).

3.2.2 Ownership

Although the nature of ownership can vary significantly depending on the size of family firms, most CFBs' controlling families prefer to retain

private ownership or ownership control for three key reasons. First, CFBs often are highly profitable businesses, so by keeping private ownership, the family owners get to pocket all the profit earned (Fukuyama, 1995; Schlevogt, 2002). Second, most CFB owners regard their family firms as private properties, and thus prefer to keep them in the hands of family members and treat any management issues strictly as 'family affairs' (M.-C. Chen, 1988; K.-K. Hwang, 1988). Under the perception of CFBs as private properties of the controlling family, they are usually kept in the owners/controlling families and passed on from one generation to the next (Weidenbaum, 1996; Yan & Soreson, 2006). For instance, it is typical for second or third generation CFB owners to be educated and groomed specifically for the purpose of succession (B.-S. Cheng, 1993). Finally, for unlisted⁴ companies, selling shares to strangers or outsiders can be rather risky in the highly uncertain, under-regulated economic environment in Pacific Asia (Fukuyama, 1995). In recent years, there have been quite a few cases of family owners falling victim to asset-stripping fraudsters disguised as private investment bankers. Therefore, retaining private ownership can be a safe and practical option for many CFB owners, especially for those who run small and medium sized enterprises.

3.2.3 Nepotism in CFBs

Under the influence of traditional patriarchal familial values, CFB owners tend to behave favourably towards family members or ingroup members (e.g. quasi-family members, close friends, or distant relatives) (Zong, 1991). As a result, 'most if not all' strategic positions in CFBs are reserved for family members of the controlling families (Weidenbaum, 1996). Being nepotistic

towards ingroup members is not only a cultural preference, but it can also have practical advantages. First, hiring family members as top executives can help to reinforce centralised control and ensure smooth succession from one generation to the next (Carney & Gedajlovic, 2003; Chow, 2004; Zong, 1991). However, C-N. Chen (1988) criticised that this common practice of reserving strategic positions for family members has led to more and more Taiwanese stock-market-listed companies being seized by controlling families and then turned into family dynasties.

Second, hiring family members may help to reduce the agency problems because family members are more trust worthy and reliable, while their families can also have higher degree of control over them (Fukuyama, 1995; T. F.-L. Yu, 2001). Family members can also be diligent and flexible human resource and may provide or bring in valuable resources such as capital, skills, networks, and even technology at lower cost (Dyer, 2003; Hsiung, 1996; K.-K. Hwang, 1988, 1995).

Third, by offering family members jobs to work in the family firm, the owners may fulfil their familial obligation to 'take care' of family members (M.-C. Chen, 1988; Yeh & Yang, 1997).

Although nepotism towards family members can be practical and beneficial for the family owners, this in-group bias can also lead to problems. There is usually an impenetrable 'glass ceiling' for non-family employees in CFBs, as owners generally distrust 'outsiders' and thus are often reluctant to promote non-family employees to senior positions (Carney, 1998; Weidenbaum, 1996). In comparison with non-family employees, members of the owner's family are offered generous pay packages and have a much better chance of getting promotion to senior positions because of their family

ties. This differential treatment is a key reason behind the low employee morale, high turnover rates among non-family employees, and restricted company growth in CFBs (Ward, 1997; Yen, 1994a, 1994b; Ghi-Feng Yen, 1996).

3.2.4 Top Management Team and Executive Leadership

Practices of corporate governance can vary considerably among CFBs. This section will review briefly the role of CFB owners/controlling families and executive leadership. In terms of collective involvement of the owner/controlling families, they usually manage their family firms in a centralised, hierarchal manner (Jacobs et al., 1995; J. T. Li, Khatri, & Lam, 1999). Confucian familial norms and values are commonly used by owners to govern CFBs, where work life is pretty much an extension of their family life (B.-S. Cheng, 1995b; K.-K. Hwang, 1999). Besides familial values, familial hierarchy can also have influential effects on how power, assets and resources are distributed in CFBs (Jacobs et al., 1995; K.-S. Yang, 2005a; G-F. Yen, 1996). For instance, as part of an inheritance deal, CFB owners tend to use hierarchical ranking of their family as a reference to distribute senior managerial positions to family members (C.-N. Chen, 1988; B.-S. Cheng, 1993; P. S.-C. Hsu, 1997).

Although owner families as a whole have crucial roles in corporate governance, some researchers have argued that CFBs often are controlled by a single dominant leader rather than 'co-ruled' by key members of the family (B.-S. Cheng, 1993, 2005b; Schlevogt, 2002; Wall, Preston, & Zhang, 2009). Under the influence of traditional patriarchal familism, CFBs can be the 'perfect incubator for dictators' because top executives are usually given

very concentrated power and unchallenged hierarchical status to enable them to assert total control and dictate most strategic decisions (M.-C. Chen, 1988; Guo, 1988; K.-K. Hwang, 1988). Armed with power and authority, CFB leaders often opt for an authoritarian style of management, which researchers have termed 'paternalistic leadership' as Farh and Cheng (2000) explained:

'Paternalistic leadership, which combines strong discipline and authority with fatherly benevolence and more integrity couched in a "personalistic" atmosphere, has been found to be prevalent in overseas Chinese Family business....paternalistic leadership....can be defined as a father-like leadership style in which clear and strong authority is combined with concern and elements of moral leadership.' (Farh & Cheng, 2000b, p.84-85)

Under this leadership style, most CFB leaders manage their firm through a combination of authoritarian control, didactic behaviour, attention to employees' work and private lives and diligent participation in day-to-day management (B.-S. Cheng, Farh, & Jou, 2006; Farh & Cheng, 2000b). As a result, leader-subordinate interactions in CFBs are typically projected by researchers as the interactions between 'authoritarian but loving father figures' and their 'obedient children' (Bond, 1991; B.-S. Cheng, 1993).

3.2.5 CFB's Competitive Edge

Broadly speaking, CFBs are highly competitive and well known for their efficiency, flexibility, and ability to control costs and build extensive regional networks (Carney, 1998; Redding, 1995; Weidenbaum, 1996; T. F.-L. Yu, 2001).

First, owners in general are very cost-conscious and that their ability to control and cut costs is probably the most important competence for CFBs to survive and compete (Redding, 1995; T. F.-L. Yu, 2001). In additions to being highly cost-effective, CFBs in general are highly efficient entities, where service and products are usually delivered swiftly and efficiently (Redding, 1996; Redding & Wong, 1986; T. F.-L. Yu, 2009).

Second, CFBs also rely on flexibility and adaptability to survive in the fast-changing economic environment (Farh, 1995; Redding, 1995; T. F.-L. Yu, 2001). Under the influence of patriarchal familial values, CFB executives are typically given very concentrated power and unchallenged status to enable them to assert total control. With concentrated power, leaders often are able to make swift decisions and respond to contingencies quickly (Carney, 1998; Weidenbaum, 1996; T. F.-L. Yu, 2001).

Third, CFBs are also quite good at building social networks with government officials and strategic alliances (e.g. clients and suppliers) and that their networking skills is a skills which their foreign competitors found hard to imitate (Redding, 1995). For instance, it is common for manufacturing CFBs to cultivating long-term collaborations with strategic alliances in the same regional manufacturing networks and industrial clusters (D. Ip, 2000; Luo & Yeh, 2002). By collaborating and networking with key industrial partners, they are able to have better grasps of market trends, to pull in favours to solve problems, or to find extra capacity to deal with excess or urgent orders, and thus help to improve profitability and their chances of survival (B.-S. Cheng, 1995b; Fare, Grosskopf, & Lee, 1995; Redding, 1996).

Although these competences help CFBs to remain highly competitive,

they still face tough challenges while global competition intensifies. As more and more companies from emerging economies like India and China join the global marketplace, Taiwanese family firms' survival is on the line (W.-w. Chu, 2009). Aware of the tough challenges ahead, many of them have turned their attention as key to corporate profit, competitiveness and growth (C. Y.-Y. Lin & Chen, 2007). However, the existing CFB literature focus mainly on organisational structure and ownership (Yen, 1994a; T. F.-L. Yu, 2009), macro corporate governance (C.-N. Chen, 1980; Hamilton et al., 1990; Redding, 1995; Shapiro et al., 2003) and executive leadership (W.-C. Chen, 2002; Y. Huang, 2007; Silin, 1976), while teamwork for innovation in CFBs remains relatively untouched. Given the importance of innovation for CFB's long-term survival and competitiveness, this research attempts to address this issue by exploring how CFB R&D teams use teamworking to carry out product innovation. The next section will provide more details about the common characteristics of R&D teams.

3.3 Common Characteristics of NPD/R&D Teams

As with the wider sociocultural and organisational contexts, team-level contexts can also have influential effects on a team's work. Researchers have found that team-level context or team input, such as structure, knowledge, skills, size and tenure, can have significant effects on processes and outcomes (Barry & Stewart, 1997; Drach-Zahavy & Somech, 2001; Ilgen et al., 2005; Marks et al., 2001). This research focuses on NPD/R&D teams, which are commonly used to carry out product innovation. In this study, I use the terms 'NPD' and 'R&D' interchangeably, as for the practitioners they probably mean the same thing. This section will briefly

review three key 'team contexts' that can be crucial for understanding NPD/R&D teams in CFBs: task, autonomy, and team composition.

First, in terms of the task, R&D or NPD teams typically deal with non-routine tasks such as developing new products, doing research, solving technical problems, etc. Developing new products or new technologies can be much more difficult and has high levels of uncertainty and risks compared to other types of routine tasks (e.g. administrative tasks or operating machineries) (Aw, Roberts, & Winston, 2010). The complex and challenging nature of innovation tasks usually require comprehensive knowledge, skill, and experience to deal with so that R&D teams are typically consist of knowledge workers (H.-T. Chang, Chi, & Chuang, 2010).

Second, in terms of autonomy, NPD teams are typically given high levels of autonomy to equip them with the flexibility and decision-making power necessary for solving problems or developing new designs (Janz, Colquitt, & Noe, 1997). For instance, Tesluk and Mathieu (1999) established that empowering work teams with 'autonomy and discretion' may provide them 'with better opportunities to directly and quickly respond to problems' (p.214).

Third, in terms of composition, researchers have found that it can have influential effects on effectiveness (Doris Fay et al., 2006; Gebert et al., 2006; Mazenvski, 1994; Mello & Ruckes, 2006). For example, Oetzel (1998) found that heterogeneity or diversity in teams may lead to better innovative outcomes. R&D or NPD teams are often heterogeneous or cross-functional because developing new products is a complicated matter that involves many different business operations, processes or technologies (Gebert et al., 2006). Brown and Eisenhardt (1995) even described cross-functional teams

as 'the heart of efficient product development' (p.369).

Besides autonomy, task and team composition, there are other team-level contexts such as team leadership, team size and role clarity, all of which can also have influential effects on efficiency (Gladstein, 1984). However, the effect of these factors on R&D teams is less clear, although they will still be taken into consideration in the research design. The next chapter will give more details about the research methodology and strategy.

3.4 Chapter Summary

As teams do not work in isolation, CFB team members are bound to interact with their organisational and sociocultural contexts. In this chapter, I have reviewed three levels of context in relation to teamworking in CFBs: sociocultural norms, organisational traits, and common characteristics of NPD teams. At the wider sociocultural level, researchers have found that Taiwan's societal cultures, such as traditional familial values and values related to social hierarchy, are important driving forces behind robust entrepreneurship behaviours and cultural antecedents behind the success of CFBs (C.-N. Chen, 1986; P. S.-C. Hsu, 1997). Moreover, societal values on interpersonal harmony are another set of cultural norm underlying CFBs' success as these values encourage entrepreneurs and workers to cultivate interpersonal networks and long-term collaborations with business partners (K.-K. Hwang, 1996; Redding, 1995; Shapiro et al., 2003). In addition to sociocultural level context, CFBs' distinctive organisational traits, including owners' centralised control, a paternalistic executive leadership approach, and nepotism, can also have significant implications for how people work and behave in CFBs (Redding, 1995; T. F.-L. Yu, 2001). Moreover, in terms of

team level context, common characteristics of NPD teams, such as high levels of autonomy and a heterogeneous team composition, are also likely to have effects on how they work and innovate.

Overall, I have reviewed key background information regarding the context of this study in this chapter. The next chapter will explain how this study was carried out — such as why qualitative case studies were used as the research strategy, how the case studies were selected, and how the data were analysed through a grounded theory approach.

Chapter 4 Methodology

4.0 Introduction

This chapter gives details about how this research was carried out. The first part explains why qualitative case studies were used as the research strategy. The second and third parts discuss the sampling strategy and the use of in-depth semi-structured interviews to collect data. The fourth part describes how data were analysed via a grounded theory approach. Finally, the chapter concludes with a brief conclusion.

4.1 Research Strategy: Qualitative Case Studies

As explained earlier, this research seeks to explore teamworking in CFB R&D teams and to understand how they work and carry out product innovation in this particular context. In order to achieve these goals, I adopt a qualitative approach as the methodology and a multiple case studies design as the research strategy.

4.1.1 Qualitative Approach

Qualitative research as a 'naturalistic inquiry' allows researchers to 'build a complex, holistic picture, analysis words, report detailed views of informants, and conduct the study in a natural setting' (Creswell, 1998, p.15) Even though the quantitative approach is probably the 'mainstream approach' in team research (Dorsey et al., 2009), there are four reasons for using qualitative approach.

First, qualitative approach is well suited to exploring social phenomena

(Cooper & Schindler, 2003). As mentioned earlier, much is unknown about how team work in Chinese firms (Phan et al., 2010), so it would be more appropriate to explore how CFB R&D teams work first rather than to impose existing Western concepts and measurements on them. The qualitative approach's theory-generating nature allows me to explore teamworking in CFBs and use a cultural-insider perspective to develop a theory to explain this specific phenomenon.

Second, given that as a type of sociocultural phenomenon, teamworking is complex in nature, so qualitative approach's inductive nature would be more suitable for investigating such complex issues. Many indigenous psychologists (e.g. Adair, 1999; Kim, 2000; Kim et al., 1999; Shweder, 2000; Sinha, 1997; Chung-Fang. Yang, 2001) have argued that the qualitative approach is a more suitable research strategy for acquiring in-depth understandings of sociocultural or psychological phenomena. For example, Ratner (2002) explained:

'Qualitative methods are necessary for discerning the cultural character of psychological phenomena... Qualitative methodology assumes that the nature of a psychological phenomenon is complex, subtle, variable, and difficult to recognize in behaviour because any act may represent a number of psychological phenomena and a number of psychological phenomena may be expressed by a single act.'(Ratner, 2002, p121)

Since psychological or sociocultural phenomena are complex in nature, abstracted statistical correlations, which are commonly used in the quantitative approach to define meaningfulness, may not be sufficient for explaining how things are and why they are the way they are (Adair, 1999; Auerbach & Silverstein, 2003; Pedhazur & Schmelkin, 1991). In qualitative

approach, researchers usually use 'thickly-described' theoretical narratives and theoretical frameworks derived from analysing context-rich data to give holistic pictures of the sociocultural phenomena in research (Corbetta, 2003; Creswell, 1998).

Third, another reason for using the qualitative approach is that this study seeks to understand teamworking in the context of CFB teams from a cultural-insiders' points of view. Unlike quantitative researchers, who use research participants as a means to produce proof (i.e. statistical data) to support their predetermined hypotheses, qualitative researchers are more interested in understanding research concerns from research participant's perspectives by using their opinions and knowledge as the main sources of understanding (Auerbach & Silverstein, 2003; Creswell, 2003). Therefore, instead of using subject experts to gather statistical evidence to confirm the author's beliefs about how these teams 'should' work, this study seeks to understand how those who actually work in CFB R&D teams feel about working in teams, how they work as a team, and how they carry out product innovation.

Fourth, the qualitative approach as a 'naturalistic inquiry' is also great for exploring real-life scenarios in their natural setting that this is highly compatible with indigenous psychology's emphasis on understanding people in context (Adair, 1999; P. R. Jackson, 2005; Shweder, 2000). Even though studies on real work teams are on the rise, Salas et al. (2008) still argued: 'there are few rigorous studies of teams 'in the wild' in their full situated context' (p.544). As 'decontextualised' team research continue to dominate the existing team literature, culture and context in team research are typically excluded from the research design in order to prevent

contamination of the statistical significance of selected variables (Engestrom, 2008). The exclusion of culture and context, combined with the dominate Western view in the existing literature, means that much is still unknown how culture and context affect real-life teamworking, especially on teamworking in non-Western settings (Norenzayan & Heine, 2005). Yet, culture and context do have important effects on how people think, work and interact across cultures (Markus & Kitayama, 1991; Smith & Bond, 1998). Cultural differences are the reasons why team or entrepreneurship literature carried out in Western settings cannot be universally applicable (D. Ip, 2000; Thomas & Mueller, 2000). Therefore, we should take culture and context into consideration if we want to gain good understandings of how teams work and innovate in non-Western settings.

Given that Chinese economies play increasingly important roles in the world as indispensable engines of global economic growth, this study aims to use a qualitative approach to explore teamwork for innovation in a Chinese setting, specifically, in Chinese family firms. For Chinese economies, indigenous family firms have important economic roles as pillars which support their sustained high economic growth as well as sociocultural roles as a unique way of life for many people (Shapiro et al., 2003; Weidenbaum & Hughes, 1996). Taking Taiwan as an example, it is estimated that family firms 'account for at least two-thirds of its economy and employ more than half of the island's workforce (Farh, 1995, p.277). Family firms' unique settings may have significant implications for how their teams are managed and on how they innovate (Carney, 1998; Hollows & Clegg, 2006; Redding, 1995; Jianjun. Zhang & Ma, 2009). Despite the fact that teams are used widely in CFBs for product innovation, there is a lack of research on

teamwork or teamwork for innovation in this domain.

Even though research on Chinese teams is on the rise, much remains unknown about how real-life Chinese teams work and how their context affect the way they work and innovate for following reasons. First, a considerable proportion of the existing Chinese team studies employ experimental design and use mock student groups as research subjects (e.g. C.-C. Chang, Tsai, & Chuan, 2003; Jia-Chi Huang, 2003; Sheng, Chen, Chou, & Chen, 2005; S.-F. Wang, Huang, & Cheng, 2002). This type of experimental studies may offer very limited insights into understanding real work teams in CFBs. Several researchers (Cohen & Bailey, 1997; Slaughter, Yu, & Koehly, 2009; Stone-Romero, 2002) pointed out that experimental research on mock student groups offers little utility for understanding complex real-life teamworking in long-term work teams given the manipulated settings, 'experimenter expectancy effects'⁵ and unrepresentative samples used in their study.

Second, besides experimental studies, there are also quite a few studies on virtual teams conducted in the Chinese context (e.g. H.-c. Hsu, 2005b; T.-C. Lin, Wu, & Leu, 2003; T.-C. Lin, Yang, & Wu, 2002; Tu & Chang, 2006). This type of team research may also offer limited insight into how CFB teams work and innovate. This is because virtual teams work very differently as compared to long-term work teams embedded in organisations, where team members have close face-to-face interactions with colleagues on a daily basis.

Third, in addition to these two streams of research, there are also increasing studies on real work teams in the Chinese context, such as Tjosvold and colleagues' work (e.g. Tjosvold, Hui, Ding, & Hu, 2003;

Tjosvold, Law, & Sun, 2006; Tjosvold & Sun, 2000) on conflict management. Besides conflict management, researchers (M.-H. Chen, 2009; Chou et al., 2006) have also explored the effects of 'Guanxi' in Chinese work teams. Although these studies provide us with some clues about the dynamics of real-life Chinese teams, much remains unknown about how Chinese culture and organisational settings affect real-life teamworking in Chinese family firms. This is because most studies on Chinese work teams employ the mainstream approach which is dominated by Western views and de-contextualised qualitative approaches, while only a few handfults take some elements of Chinese culture into consideration in their research design. In the light of the lack of a comprehensive review into the effects of culture and context on Chinese work teams, a qualitative study to explore teamwork for product innovation in CFBs may provide us with a more accurate and complete understandings.

4.1.2 Qualitative Case Studies as the Research Strategy

Even though a qualitative approach can be a great means of studying teamworking in CFBs, not all qualitative methods are suitable for studying teams in this particular setting. Among a variety of qualitative methods (e.g. open-ended questionnaires, participative observation and working diaries), a multiple cases study approach was chosen as the research strategy. A case study can be defined as:

'...a research strategy that can be qualified as holistic in nature, following an iterative-parallel way of proceeding, looking at only a few strategically selected cases, observed in their natural context in an open-ended way, explicitly avoiding (all variants of) tunnel vision, making use of analytical comparison of cases or sub-cases, and

aiming at description and explanation of complex and entangled attributes, patterns, structures or processes' (Verschuren, 2003, p.137).

The case study approach is widely used in organisational research because it is great for exploring 'bounded systems over time through detailed, in-depth data collection involving multiple sources of information rich in context' (Creswell, 1998, p.61). Teams or organisations are examples of 'bounded systems' that they all have clearly defined boundaries, which are used to define responsibility, distribute work, and manage resources. Through a case study approach, researchers can collect multiple sources of information related to the bounded system in research, such as interviews, financial data, work diaries or external evaluation to compare what is said and who said what (Berg, 1998; Creswell, 1998; Nieto, 2000; Saunders, Philip, & Adrian, 2000). The use of multiple sources of data is also known as 'data triangulation' which may help researchers to improve the validity and reliability of their analysis by cross-examining different types of data to look for support, consistency, reoccurrence, or anomalies (Baxter & Jack, 2008; Chenail, 1997; Jonsen & Jehn, 2009).

In a way, CFB R&D teams can be considered as small bounded systems which are embedded in a larger bounded system (i.e. the family firms within which they work). Via a case study design, I was able to explore how different members of CFB R&D teams feel about teamworking, and to compare and contrast complex mentalities behind 'teamworking' in these teams. It is also possible to explore how different 'boundaries' (e.g. team boundary and CFBs' organisational boundary) affect team members' personal experience of teamworking. As explained earlier, this project not

only seeks to understand teamworking on the part of those who work in CFB R&D teams, but it also aims to explore the effects of CFBs' organisational characteristics and sociocultural context on teamworking.

Besides the benefits of being able to compare and contrast mentalities within team boundaries, there are three other reasons for using a qualitative case study design. First, both Gummasson (1991) and Berg (1998) suggested that case study approach is very useful for exploring the detailed processes of how things, people or groups operate/function in organisations. As this project aims to understand the teamwork processes for product innovation in CFBs, a case study approach would be an ideal means for exploring innovation processes in detail.

Second, Yin (2003) suggested that a case studies approach is most suitable when: (1) 'how or why questions are being proposed', (2) when the investigator has 'little or no control over events', and (3) when the focus is on a 'contemporary phenomenon within some real-life context' (p.1). This project fits all these conditions, since its focus is to explore the psychology behind real-life teamworking scenarios in CFBs, over which the researcher has no control over.

Finally, according to Stake (2005), a case study is ideal for exploring experiential knowledge that is understood in context. As explained earlier, the focus of the study is to understand teamwork for product innovation from CFB R&D personnel's points of views. Via a case study design, this goal can be achieved by using subject experts' knowledge and experience as main sources of understanding while taking the effects of context (i.e. their work environment, company policies, etc.) into account to enable better understanding.

Although a qualitative case study design has much to offer for team and organisational research, Gummesson (1991) suggested that its theory-generating and context-bound nature also mean that theories generated from qualitative case studies lack statistical validity and have limited generalisability (i.e. low external validity). However, Dyer and Wilkins (1991) argued that statistical proof and replicability should be the least concern for researchers who adopt a qualitative case study design because these researchers are seeking in-depth understanding of complicated real-life scenarios rather than producing statistical correlations to prove the universality of predetermined hypotheses. They suggested that 'the heart of case studies' lies in whether:

'...the researcher is able to understand and describe the context of the social dynamics of the scene in questions to such a degree as to make the context intelligible to the reader and to generate theory in relation to that context; not the numbers of the cases, nor how much time researchers spent in the field.' (Dyer & Wilkins, 1991, p.161)

According to them, the actual number of cases is irrelevant, as both a single case study approach and multiple case studies approach can yield good understanding of a social phenomenon.

Comparatively speaking, a single case study approach can enable researchers to probe deeper into a phenomenon, while a multiple-cases approach may help them to broaden their investigation by including and comparing more cases. According to Eisenhardt (1989), a multiple qualitative cases approach, which resembles a 'replication logic', may enable researchers to enhance the validity of their theoretical propositions by

confirming or replicating emerging patterns across cases. In addition to more reliable results, Eisenhardt and Graebner (2007) later suggested that the multiple case study design can also 'enable broader exploration of research questions and theoretical elaboration' as researchers can select different types of cases in order to extend theories or explore alternatives. Similarly, Herriott and Firestone (1983) also suggested that multiple-case studies are more 'compelling' and 'robust' as compared to a single-case study approach. Based on these rationales, I used a multiple-cases approach as the research strategy. Three case studies were carried out in three family-owned manufacturing firms in Taiwan. How the cases were chosen will be explained in section 4.3, while the results of each case study will be presented in Chapters Five, Six and Seven. The following sections will give more details about how the data were collected via in-depth interviews.

4.2 In-depth Interviews as the Data Collection Strategy

Collecting the right sort of data is essential for answering the research questions. As this research seeks to understand teamworking in CFB R&D teams from the subject expert's points of view, the data collection strategy should allow the research participants (i.e. those who actually work in CFB R&D teams) the freedom and opportunities to express their opinions and experience of working in teams. There is a variety of qualitative data collection techniques, such as open-ended questionnaire, interviews, participative observation, and critical incident reports. All of these approaches allow the research participants the freedom to express true opinions and experience. Of these techniques, I used interviews as the main data collection strategy, while secondary data, including published financial

reports and information gathered on-site (e.g. company brochure, samples of products, statistics about their companies, etc.) are used as aids to support interpretations of interview statements.

There are three reasons for using interviews, which is 'a research-gathering approach that seeks to create a listening space where meaning is constructed through an interexchange/co-creation of verbal viewpoints in the interest of scientific knowing' (Miller & Crabtree, 1999a, p.89), as the main data collection strategy: access, multiple levels of analysis, and the quality of data.

First, interview is probably one of the most practical and feasible data collection method when it comes to negotiating access and doing field research in organisations (King, 2004a). Family firms in Taiwan are known for being highly secretive and low-key (K.-K. Hwang, 1988; D. Ip, 2000), and therefore they are rather difficult to gain access to. Given that both researchers and general public are familiar with the interview approach, CFBs' gatekeepers (e.g. owners, publicists, senior managers, etc) may be more willing to accept interviews compared to other less-well-known approaches such as participative observation, critical incident reports, or work diaries. Having said so, negotiating access to Taiwanese family firms was proven to be one tough challenge. Even with the help of two prominent figures from the influential trade associations Chinese National Federation of Industries and General Commerce of the Republic of China, many attempts to negotiate access were fruitless.

Second, interview's flexible and dynamic nature allows researchers to explore 'different levels of meanings' that this are very difficult to achieve via static research instrument like questionnaires (King, 2004a, p.21). As

explained, for those who work in CFB teams, they do not work in isolation but they co-exist and interact with their work environment. Given the interactive nature of interviews, it is possible to verify the effects of their work context on how they work through interactive discussion while it is also possible to clarify different levels of contextual effects and ambiguous meanings.

Third, comparatively speaking, the quality of the data collected via in-depth interviews should be better as compared to data collected through open-ended questionnaires. Interviews' interactive nature allows researchers to explore issues and to refine and clarify meanings (Corbetta, 2003). In contrast, open-ended questionnaires are statistic in nature so that researchers do not get the chance to verify meaning or to salvage incomplete or ambiguous answers. As open-ended questionnaires can be time-consuming to complete, it would be unrealistic to expect busy workers like R&D personnel to spend 'quality time' to complete a lengthy questionnaire in detail. Researchers have found that the quality of data collected through lengthy questionnaires is likely to be dreadful due to incomplete answers caused by 'response set syndrome' as participants simply do not have the patience to fill in lengthy questionnaires in great detail (Hui & Triandis, 1985; C.-F. Yang, 1996). In addition to the response set syndrome, another problem with open-ended questionnaire is that Taiwanese people are known to have a peculiar response style to questionnaires (J.-W. Ju, 2001; C.-F. Yang, 1996; K.-S. Yang, 1982), or a 'response bias' according to cross-cultural researchers (Hanges, 2004). For example, K-S. Yang (1982) noted that Taiwanese subjects tend to give answers which are either: (a) socially approved answers, (b) mid-ranged

scores, or (c) meaningless answers like 'I don't know' or 'no opinion' when responding to questionnaires. C-F. Yang (1996) explained that this tendency to give answers, that may be regarded as appropriate and in compliance with sociocultural norms rather than truthful answers, is because under the influence of Taiwan's sociocultural norms individuals are encouraged to be humble, to behave appropriately, and to conform with societal norms and values. Other researchers (e.g. I. Choi, Nisbett, & Norenzayan, 1999; J.-W. Ju, 2001) also suggested that Chinese participants are rather 'situational sensitive', so they may give different answers to the same questions under different circumstances. The effects of such 'situational sensitivity' can be verified through interactive conversation in interviews.

Based on these reasons, it is clear that in-depth interviews can be a more appropriate data collection strategy as compared to other feasible instruments like open-ended questionnaires.

4.2.1 Semi-structured In-depth Interview

Interviews can be divided into many different types such as focus groups, expert interview, etc. The most commonly used typologies are: unstructured interviews, semi-structured interviews, and structured interviews (King, 2004a; Saunders et al., 2000). Unstructured and semi-structured interviews are associated typically with the qualitative approach, and they are often referred as qualitative interviews or in-depth interviews (Silverman, 1993). Conversely, structured interviews are associated typically with quantitative approach. In structured interviews, researchers have to follow a predetermined interview plan, which contains a list of pre-selected questions (Creswell, 2003; Silverman, 1993). There are

three key differences between structured quantitative interviews and qualitative/in-depth interviews: flexibility, the role of the interviewees, and interactions between researchers and interviewees.

First, qualitative in-depth interviews have no or a low degree of structure which makes them highly flexible. As such, researchers do not have to follow a predetermined interview plan, so they have the flexibility to allow their interviewees the freedom and opportunities to 'express their subjective experience, expertise, knowledge, rationales or subjective meanings' (King, 2004a, p.11). In contrast, in structured interviews, both the researchers and participants have to follow a sequence of pre-set questions (Silverman, 1993). Consequently, they do not have the freedom or the flexibility to 'deviate' from this predetermined list of questions to discuss important issues, which are not included in the interview plan but are relevant to the research concerns.

Second, unlike quantitative interview in which interviewees are used as a means to gather 'correct' information in order to support researchers' hypotheses (Corbetta, 2003; King, 2004a), interviewees in qualitative interviews are treated as informant who provide knowledge to the researchers for their understanding of the research topics. Through focused discussions with interviewees, researchers can explore research topics, understand research concerns from interviewee's points of view and establish 'why and how they have this particular perspective' (King, 2004a, p.11). This is highly compatible with indigenous psychology's key emphasis on using cultural insiders' knowledge as main sources of understanding (Kim, 2000).

Third, dynamic interpersonal interactions are encouraged in qualitative

interviews but minimised in quantitative interviews. In quantitative structured interviews, interpersonal interaction is strictly restricted because researchers want to keep the interview as objective and as accurate as possible by minimising the 'contamination' of interpersonal interactions (Corbetta, 2003). In contrast, in qualitative in-depth interviews, researchers acknowledge that their interactions with their interviewees are vital for exploring issues, clarifying ambiguous meanings, evaluating the importance of the issue to the interviewees, and verifying 'cause-effect relationship between situations, events, and response' (Ratner, 2002, p.155).

In this study, I used semi-structured in-depth interviews as the data collection method. As explained, I needed the flexibility to allow my research participants the freedom to express their opinions and experience. On another front, I also wish to focus on issues which are vital for understanding teamworking in CFBs such as interpersonal interaction, communication, and the effects of their contexts on how they work and innovate. Given these reasons, a semi-structured interview approach, which is in between free-flowing, hard-to-control unstructured interview and rigid structured interview, was probably the most practical option for me to allow flexibility while keeping the conversation focused.

4.2.2 One-To-One Interviews: Collecting Data at the Individual Level

Although the focus of this study is to explore team-level work patterns in the context of CFB R&D teams, data were collected at individual level via one-to-one interviews. There are four reasons for collecting data at individual level instead of the collective team level such as via focus groups or meetings. First, it can be difficult to control the flow of conversation in

focus groups. Second, the responses gathered from focus groups are likely to be rather uneven, as more talkative or extrovert participants are likely to contribute more ideas. Such uneven responses may not reveal the full picture behind the complex mentality of team dynamics. Third, some teamwork topics such as conflict or leader-subordinate interaction are rather sensitive in nature. Therefore, participants may not wish to discuss such delicate issues in public. In one-to-one interviews, they have the privacy and confidentiality which can be vital for enabling less inhibited conversation. Finally, another important reason for using one-to-one in-depth interviews is that it allows every participant sufficient time and equal opportunities to express ideas and discuss issues which they regard as important matters related to working or innovating in teams. Unlike quantitative interviews in which both researchers and participants have to stick to a set of fixed questions, qualitative researchers do not standardise the interview questions or rigidly follow the sequence of questions listed in the interview plan. This is because in in-depth interviews, researchers want their participants to express opinions freely and may encourage them to elaborate on information or issues which provide new insights related to the research concerns. As researchers cannot predict each participant's response, they need the flexibility to adapt to the unique personalities or perspectives of each respondent (Corbetta, 2003).

4.2.3 Interview Plan, Cover Letter and Confidential Agreement

In this study, an interview plan was drawn up before conducting the interviews in the field. The intention of having an interview plan which covers a list of questions and prompts is to help the researcher to guide the

participants to discuss their experience of working in teams and developing new products in CFBs. The predetermined plan also helped me to stay on focus and cover topics which mattered for understanding teamworking in this particular context. However, the sequence of questions was not rigidly followed because doing so would more or less restrict the participants' freedom to express, that in turn, may inhibit the flow of conversation.

The prompts and questions listed in the interview plan were developed based on my understanding of the literature, including teamwork, organisational psychology, indigenous psychology, and cross-cultural psychology literature. The first version of the interview plan was tested in two pilot studies in which a total of five interviews were carried out. Based on the feedback and the researcher's own reflection, the content and prompt questions were altered to make the questions more understandable by eliminating confusing wordings (e.g. academic jargons) and adding examples. This modified version of interview plan was then used in the main study, in which a total of 25 interviews were carried out. The interviews lasted between 45 minutes and 60 minutes⁶. The actual plan used in the interviews is listed in the appendices as Appendix 1 (Mandarin version) and Appendix 2 (English version, translated from the Mandarin version for reporting purpose).

The finalised interview plan contained nine key topics. The first and second sets of questions were used to gather background information on the participants' work context, including their organisational settings (e.g. ownership, size of the firm, products) and the characteristics of their team (e.g. team structure, size, management practices). The third group of questions and prompts focused on actual product innovation processes (i.e.

how they develop new product from scratch). The fourth set of questions encouraged participants to talk about creativity and the driving forces behind product innovation, such as how they come up with ideas for new designs or techniques. The fifth group of questions encouraged the interviewees to talk about decision-making processes such as how creative ideas were materialised into new ideas and who make the decisions (e.g. what ideas to adopt). The sixth set of questions asked interviewees how they interact and collaborate with colleagues and how their collaboration with others affects the way they work. The seventh group of questions explored intra-team communication and communication outside team boundaries such as how do they communicate with fellow team mate and relevant external parties (e.g. clients), how they resolve conflicts in teams, conformity pressure and minority dissent. The eighth set of questions aimed to explore leader-subordinate interactions, such as leadership styles, leadership behaviours, and subordinate perceptions. Finally, at the closing stage of the interviews, participants were also given the chance to express their opinion about what can be done to improve product innovation or what aspect of teamworking needs to be improved. Not all the questions or prompts listed on the interviews were asked in every interview. This is because these questions are interrelated and the interviewees may have shared information or given examples which have already covered two or three different areas of the interview plan.

As explained earlier, this study seeks to understand teamworking in context which include sociocultural context, organisational context, and team level context. However, I only listed questions about organisational context and team level context and did not include a set of questions to

explore the effects of sociocultural context and cultural norms. This was done for two reasons. First, the effects of Taiwan's sociocultural context on teamworking in CFBs are not the main focus of the study. Second, I found that in the pilot studies and main studies, the interviewees often used sociocultural norms to explain the rationale behind their behaviours or interactions when working in teams. For instance, they were asked about their experience of dealing with conflicts in their teams and that many of them used cultural norms (e.g. societal emphasis on interpersonal harmony) to explain why they believe conflict is not a good thing and why they prefer to yield to prevent small conflicts from escalating into full-on confrontation. Therefore, it would not be necessary to ask the participants a separate set of questions about how they think sociocultural norms affect the way they work in teams.

Besides research topics and prompts, the interview plan also contained an opening statement in the form of a short introduction to the research and a confidentiality agreement. The opening statement was read out to each participant before the interviews began to ensure that they understood the purpose of the study and to give an assurance that their identity would be kept confidential in the report. Participants and business owners were also given a cover letter as illustrated in Appendix 3 (Mandarin version) and Appendix 4 (English version). This cover letter gave the business owners and the gatekeepers (e.g. R&D directors) a brief description of this study and a confidentiality assurance. The cover letter and the confidential agreement were vital for gaining access and for improving interviewees' willingness to participate in the interviews. Without explaining the purpose of the study and assuring confidentiality, it would have been virtually impossible to

collect quality data in these highly secretive CFBs.

Besides helping to gain access and improve collaboration, the cover letter and a confidential agreement were also vital for the ethical integrity of this research. Christans (2005) pointed out that researchers should guarantee research participants anonymity by concealing their identity as a safeguard to unwanted exposure which may otherwise invade their privacy and cause embarrassment. Miller and Crabtree (1999) also suggested that qualitative researchers should have at least three ethical concerns over the rights of their interview participants: (a) researchers should obtain 'informed consent' from their participants, (b) interviewees' identities and privacy should be protected and kept confidential, and (c) participants should have the right to refuse or stop the recording of interviews. In this study, before the researcher began recording the interviews, confidential agreements were read out to all participants to seek their consents and to give an assurance of confidentiality.

4.3 Case Selection

Collecting the right sort of data via representative samples is pivotal to answering the research question. In this study, I used theoretical/selective sampling to select the cases and theoretical saturation to determine the numbers of cases and interviews. Both theoretical/selective sampling and theoretical saturation are commonly used in qualitative studies, especially those which employ the grounded theory approach (Charmaz, 2006; Keddy, Sims, & Stern, 1996; Mason, 2002). There are three reasons for using a theoretical/selective sampling approach, which 'entails choosing research participants who have information related to your research concerns'

(Auerbach & Silverstein, 2003, p.18). First, I wanted to explore how work teams function in the context of Taiwanese family firms which are the target population. However, it would be rather difficult to pinpoint this target population given that family firms are so heterogeneous in nature and therefore researchers are unable to agree on universally applicable criteria of family firms (Chrisman et al., 2010). According to Auerbach and Silverstein (2003), a theoretical sampling strategy is most appropriate when it is impossible to define a target population. In the light of the lack of universally applicable definitions of family firms, I used two criteria to select my samples: (1) indigenous Taiwanese firms managed by local families, and (2) the controlling families must have total control over their firms.

Second, given that family firms are heterogeneous in nature, it would not be feasible to collect empirically representative samples because this requires a large sample size to cover all varieties of family firms. For qualitative researchers, empirical representativeness of the sample comes at the cost of analytical sensitivity and in-depth understanding (Mason, 2002). As qualitative data is very time and effort consuming to analyse, researchers cannot go through a large sample in great detail, which in turn, may jeopardise analytical sensitivity and in-depth understanding (Dey, 1993). In this study, I used theoretical sampling to select family firms in manufacturing sectors as the samples, given that manufacturing family firms are probably the most common form of family firms in Taiwan and other Chinese societies as well (Carney, 1998). In Taiwan's, most private sectors are dominated by family-owned or family-controlled firms which account for at least two-thirds of the economy (Farh, 1995; Fukuyama, 1995;

Hamilton et al., 1990). The manufacturing sector is the largest industrial sector which accounts for 93.3% of total industrial output and contributes 65% of Taiwan's gross domestic product (GDP) (Business Monitor International BMI, 2011). What we learned about teamworking in manufacturing family firms should give us some general ideas about how teams work for innovation in the context of CFBs.

Finally, another reason for using theoretical sampling is for the sake of access. As explained earlier, family firms in general are highly secretive entities and therefore are very difficult to access (Neubauer & Lank, 1998) and Taiwanese family firms are no exceptions (D. Ip, 2000). Therefore, random sampling strategies such as cold-calling are not feasible options for negotiating access to these secretive entities, so a selective sampling strategy was used as an alternative. Via selective sampling, I was able to focus on approaching suitable family firms that have relevant information regarding the research concerns and are willing to share such information with researchers.

Besides selecting cases which can provide the right sort of information regarding the research concerns, determining the size of the cases and the interviews is also an important issue. Sample size should be large enough to ensure enough information is gathered in order to achieve a good understanding of the phenomena in research. Unlike quantitative researchers who determine their sample size based on statistical calculation on whether the sample size is big enough to curb sampling error (Guion, 2002), in the grounded theory approach researchers simply stop collecting more data when they reach the point of theoretical saturation. Theoretical saturation means 'the point that new group of participants basically tell you

the same things' (Auerbach & Silverstein, 2003, p.18), or the point when further data 'no longer produce significant conceptual variations' (Dey, 1999, p.9). In qualitative studies, the sample size is usually small as context-rich qualitative data requires a lot of time, effort, and attention to analyse (Corbetta, 2003). Dey (1999) pointed out that qualitative researchers often face a dilemma between depth and variety when determining sample size. On the one hand, if they focus on only a few samples, they can explore the research topic in more depth and perhaps have a more comprehensive understanding. On the other hand, if they collect more samples, they may uncover more variety or exceptions to help them refine and extend their theoretical narratives and perhaps improve generalisability. However, by including more samples, researchers may have to make the 'trade-off' between 'breadth and depth of knowledge' (Dey, 1999, p.30).

In this study, I selected NPD teams from five Taiwanese manufacturing firms as the samples based on a combination of theoretical sampling strategy and convenient sampling rationale. In terms of theoretical sampling, I used three key criteria to select my samples: family firms which are (1) still controlled by founding families, (2) indigenous to Taiwan's society, and (3) are in the traditional manufacturing sectors. These criteria were vital to ensure that the samples selected represent the target population of CFBs in Taiwan. In terms of convenient sampling strategy, the samples were selected from a selection of potentially accessible firms. This short list was drawn from my meetings with two prominent figures of Chinese National Federation of Industries and General Commerce of the Republic of China. The two trade representatives offered me a list of suitable family-controlled manufacturing firms which fitted the three criteria mentioned above and were members of

their trade associations. One of the trade representatives helped me to contact gatekeepers of these firms through personal contacts. We approached a few dozen potentially suitable firms but most of them rejected our request for access and only ten of them agreed for me to meet up with their gatekeepers (e.g. their public relation personnel, general manager or CEO). Of the firms I visited, five of them were selected as samples as they had the right sort of information regarding the research concerns and were willing to participate in the study. While the rest of the firms either did not have the right sort of information regarding using teams to carry out innovation, or they were unwilling to participate in the study. It may be worth noting that the gatekeepers of the participating firms did not agree to my access because they have a more open attitude towards researchers which may make them atypical of conservative CFBs. Instead, they only agreed to participate in the study mainly because they had strong personal ties with my informant and thus were willing to do him a favour by granting my request to interview their employees. Interpersonal ties which provide a basis of trust were proven as the most important factor for negotiating access to highly secretive CFBs.

Two of the five selected firms were used in the pilot study and three of them were used in the main study. In the pilot study, five interviews were carried out to 'test-run' the interview plans. In the main study, I carried out 25 recorded interviews which were used as the main source of data. In each case study, I stopped doing more interviews when I reached the point of theoretical saturation which basically means that the interviewees were giving more or less the same or similar information (Auerbach & Silverstein, 2003). In the first case study, the interview process stopped at the tenth

interview. In the second case study, all of the technical personnel, other than two supporting administrative staff, were interviewed. In the third study, five out of the six NPD team members were interviewed as the head of the department was unable to attend the interview because he was at an overseas subsidiary at the time of my access. All of recorded interviews carried out in the field (i.e. both pilot and main study) added up to a total number of 30.

In addition to these recorded interviews, I also carried out five meetings with the gatekeepers (e.g. CEO, general managers, or R&D directors who allow access to research participants) to negotiate access and discuss some aspects of the research concerns. These meetings were not recorded and the information gathered (e.g. field notes and company brochure) was used as 'background information' to aid my understanding of the research concerns. There are two reasons for not using these meetings as data. First, these meetings were not recorded and therefore no exact quotation can be cited from them. Second, these meetings do not necessary cover all aspects of the research concerns as not all of the persons participated in the meetings had close involvement in managing NPD teams or product innovation. For instance, the trade representative of Chinese National Federation of Industries, who introduced me to the gatekeepers, was present at all these meetings and he also participated in the discussions with the gatekeepers.

4.3.1 Two Pilot Studies

Prior to the main study, I carried out two pilot studies. According to Van Teijlingen and Hundley (2001), pilot studies as 'mini versions of a full-scale study' can serve several functions such as helping to test the feasibility of the

study, allow pre-testing of the research instruments, collecting preliminary data, etc. In this project, the pilot studies were carried out to verify the feasibility of the study and to test-run the interview plan. In terms of feasibility, the results of the pilot studies indicate that using interviews to explore how teams use teamwork to carry out product innovation and how their unique work context affects the way they work is feasible. In terms of pre-testing the research instrument, the five interviews carried out in the pilot study were rather useful for improvising the interview plan and the researcher's interview skills. Based on the participants' response and my own reflections, I altered the questions and prompts listed in the interview plan by eliminating academic jargons, replacing complex questions with simple and straightforward alternatives, and adding examples to help the participants to understand what kind of information that I was seeking for. Finally, another important function of the pilot study is to collect preliminary data to enable initial understanding of the research concerns. Based on the results of the findings of the pilot studies, I also altered the focus the study slightly and refined the key topics in the interview plan. Taking communication in teams as an example, I asked the interviewees in the pilot studies how they communicate and exchange ideas. Based on the results, I then divided the topic of communication into four sub-topics: (1) formal versus informal communication, (2) conflict resolution, (3) pressure from the top and conformity pressure, and (4) minority dissent. These issues were raised by the interviewees in the pilot studies, so that they seemed to be vital for understanding team dynamics in CFB teams.

Given that I changed the interview plan considerably based on the results of the pilot studies and the main purpose of pilot studies is to

'test-run' the interview plan rather than to collect data, it may not be appropriate to present the pilot studies to compare them with the main studies. The key characteristics of the companies used in the pilot studies are summarised in Table 4.1.

Table 4.1: Characteristics of the companies used in pilot studies

	Company O	Company L
Ownership	Privately-owned by the founding family.	Privately-owned by the founding family.
Owners' role	As top executives who run the day-to-day management of the firm.	As top executives who run the day-to-day management of the firm.
Owners' involvement in managing R&D operation	As team leaders who take active participation in the development of new products.	As team leaders who take active participation in the development of new products.
Product	Beverage (e.g. soft drinks, juice)	Car components
Size of the firm	50	200+
Size of R&D department	4	6
Interviews	2	3
Date of field access	July 2004	July 2004

4.3.2 The Main Study: Three Case Studies

In the main study, I used a multiple case study design based on a combination of replication and case-triangulation logic. In terms of the replication rationale, researchers can find repeating theme across cases to support their interpretation and thus enhance the credibility of the findings via replicating case studies (Baxter & Jack, 2008; Eisenhardt & Graebner, 2007). In terms of case triangulation, researchers can refine their theory and improve generalisability and the validity of their findings by including

more varieties and comparing similarities and differences found across the cases or different data sets if they conduct multiple case studies (Jonsen & Jehn, 2009; Milles & Huberman, 1994). In order to achieve these objectives, I used strategic sampling which aims 'to produce, through sampling, a relevant range of contexts or phenomena, which will enable you to make strategic and possibly cross-contextual comparisons' (Mason, 2002, p.123). In the main study, I selected three family-controlled manufacturing firms with different types of ownership: (1) a stock market-listed company on Taiwan's main stock exchange (TSE), (2) an over-the-counter (OTC) exchange security market-listed company, and (3) a privately-owned company. The different ownership structures also mean that these firms have different levels of ownership concentration as illustrated in Table 4.2. By investigating how teams work in these three types of family firms, I was hoping to explore whether different types of ownership in family firms can affect how their R&D teams work and innovate. According to Chu (2011), different types of family ownership and family control arrangements can affect corporate performance (e.g. profitability) in Taiwanese family firms. The key characteristics of the three firms are summarised Table 4.2.

Moreover, the case studies were carried out over three years. The first study was carried out in July and August 2004, the second study in August 2005 and the final study in January 2006. There are two reasons why the case studies were carried out separately. First, in order to achieve better understanding of the data, qualitative data analysis should begin as soon as the data is collected (Creswell, 2003). As qualitative data is very time-consuming to analyse, it would be more appropriate to carry out and write up one study at a time. Therefore, I only started collecting more data

when the analysis and the primary report of the previous case study were completed. Second, it was very difficult to negotiate access to family firms, so that it took a very long time to seek consent from potential participants. The following section gives more detail about the cases and the interviews.

Table 4.2: Key characteristics of the three manufacturing firms used in the main study

	Case study one	Case study two	Case study three
Ownership	Listed on Taiwan's main stock exchange (TSE).	Listed on Taiwan's over-the-counter exchange (OTC).	A privately-owned family firm.
Concentration of ownership	Low	Medium	High
Company size	Large, multinational corporation	Medium-sized	Medium-sized with two overseas subsidiaries in China
The role of the founding family	Second generation family members have strategic control over the firm.	The founders who are four siblings and their spouse have total control over the firm.	The founder is still in charge with the aid of the second generation family members.
Composition of the board	A mixture of family executives and professional managers	Family executives only	Family executives only
Date of field access	July, August 2004	August 2005	January 2006
Core products	Tyres	Vending machines, plasma TVs	Brass valves, boiler, taps

4.3.2.1 Case study 1: Company K.

The first case study was carried out at Company K², which is a large multinational, main stock market-listed company. Although it has expanded

considerably in the past few decades, it is still controlled by the founding family. Currently, the second generation family members as top executives are still in charge of Company K's day-to-day management. I negotiated access to the chairman with the help of a prominent figure from Chinese National Federation of Industries who introduced me to the CEO. I had a meeting with the CEO and the vice director of the R&D department to discuss general issues related to product innovation, such as the use of teams, new products and existing product portfolios, new management practices which they adopt in relation to innovation, etc.

I interviewed ten of their 64-strong R&D personnel. There are three reasons why only ten interviews were carried out. First, the interview schedules and the numbers of interviews were arranged by the vice director who played the role of the secondary gate keeper. He only arranged ten interviews because their R&D personnel were extremely busy, so not all of them have the time to spare to participate in the study. I had no control over these arrangements, as this is a common dilemma when doing field research. Second, by the time of the last few interviews, the research participants were starting to offer repeated or similar information. As it seemed to have reached the point of theoretical saturation, I did not ask for anymore interviews. Finally, I only had very limited resources as a self-funded researcher, so it was not feasible to interview all 64-strong R&D personnel, particularly given that context-rich data is very costly and time-consuming to analyse. The following Table 4.3 gives key information regarding the case.

Table 4.3: Key characteristics of case study one

	Company K*
Ownership	Taipei main stock market-listed company
Role of the founding family	Second generation family members as the top executives still have dominant control over the firm
Product	Tyres
Size & operational scope	Large multinational firm with subsidiaries in several countries
Time of access	July-August 2004
Gatekeeper/access permitted by	The chairman, who is the patriarch of the controlling family
Controlling family's role on the management of R&D operation	Owners have no direct participation but oversee the progress of R&D projects closely. Empowered professional managers to run R&D operation.
Size of the R&D department	64
No. of interviews	10
Composition of department	Cross-functional
Functional background of the interviewees	R&D director, director of overseas operation, senior directors, marketing managers, sales representatives, line managers, and junior engineers
Ethnic background of the interviewees	All of them are native Taiwanese who live and work at the ChangHua county, which is the smallest county in Taiwan and is located in the centre of the Westside.

* Code is used to protect the confidentiality of the participating company.

Table 4.4: Information about the interviewees of case study one

	Job title	Functional background	Tenure	Age	Gender
Interviewee 1	Senior manager	Technical expertise, in charge of product design	20 years	Baby boomer	Male
Interviewee 2	Senior manager	Technical expertise in material science	25 years	Baby boomer	Male
Interviewee 3	Senior manager	Technical expertise in marketing	22 years	Baby boomer	Male
Interviewee 4	Middle manager	Technical expertise; in charge of product design	8 years	X, Y generation	Male
Interviewee 5	Middle manager	Technical expertise; in charge of product design and production arrangement	10 years	X, Y generation	Male
Interviewee 6	Line manager	Technical expertise; in charge of product design and production arrangement	8 years	X, Y generation	Male
Interviewee 7	Junior engineer	Material science & product design	5 years	X, Y generation	Male
Interviewee 8	Junior engineer	Sales/marketing	3 years	X, Y generation	Male
Interviewee 9	Directing manager	Former R&D director, currently in charge of overseas operation	34 years	Baby boomer	Male
Interviewee 10	Directing manager	Current R&D director, professional manager	5 years full-time, 20 years as a part-time consultant	Baby boomer	Male
Gatekeeper	Chairman	Monitor overall R&D operation	40 years	Baby boomer	Male
Gatekeeper	Vice director	Project manager with technical expertise	5 years	X, Y generation	Male

Moreover, in terms of the characteristics of the interviewees, they had very different functional backgrounds but very similar ethnic and sociocultural background as they are all native Taiwanese living and working in Changhua County in Taiwan. There was also a considerable age difference in between the younger X, Y generation workers and the senior baby-boomer managers, who had been working in the firm for several decades. The details of the interviewees are summarised in Table 4.4.

4.3.2.2 Case study 2: Company G.

The second case study was carried at Company G². This company is a medium-sized, secondary-stock market-listed company which manufactures vending machines, plasma televisions, LCD monitors, and other electronic products. Even though Company G is an over-the-counter stock market-listed company, it is still controlled by the founding family. They have a family-members-only top executive team (i.e. all executive positions are occupied by members of the founding family). I negotiated access with the general manager, who is a prominent figure in the controlling family, with the help of a prominent figure from Chinese National Federation of Industries who introduced me to the manager.

I interviewed most of Company G's R&D personnel to explore how they use teamwork to carry out product innovation, except two secretaries who deal with administrative tasks. The interviews were arranged by the three R&D managers, who thought that it was not necessary to interview the secretaries as they only play supporting roles and do not participate in the actual development of new products. Key characteristics of the case study are summarised in Table 4.5.

Table 4.5: Key characteristics of case study two

	Company G*
Ownership	Listed on over-the-counter-stock market (i.e. Taiwan's Gre-Tai Security market) but still controlled by the founding family.
Role of the founding family	Members of the founding family as the top executives have total control over the firm
Product	Vending machine, LCD monitor, plasma TV
Size & operational scope	Medium-sized
Time of access	July 2005
Gatekeeper/access permitted by	The general manager, who is a prominent family member of the controlling family.
Controlling family's role on the management of R&D operation	Owners act as the team leaders who dictate strategic R&D decisions such as setting goals and timelines, and selecting designs of their OBM products.
Size of the R&D department	12
No. of interviews	10 technicians
Composition of the R&D department	10 technician and two secretaries
Hierarchical positions of the interviewees	R&D managers, senior engineers and junior engineers
Ethnic background of the interviewees	All of them are native Taiwanese who live and work at the ChangHua county, which is the smallest county in Taiwan and is located in the centre of the Westside.

* Code is used to protect the confidentiality of the participating company.

Table 4.6: Information about the interviewees of case study two

	Job title	Functional background	Tenure (Years)	Age group	Gender
Interviewee 1	Manager	Technical expertise in hardware design & mechanical engineering	20	Baby boomer	Male
Interviewee 2	Manager	Technical expertise in IC and software design	8	X, Y generation	Male
Interviewee 3	Manager	Technical expertise in IC and software design	3	X, Y generation	Male
Interviewee 4	Senior engineer	Technical expertise in hardware design & mechanical engineering	30	Baby boomer	Male
Interviewee 5	Senior engineer	Technical expertise in hardware design & mechanical engineering	1	X, Y generation	Male
Interviewee 6	Junior engineer	Technical expertise in hardware design & mechanical engineering	1	X, Y generation	Male
Interviewee 7	Junior engineer	Technical expertise in IC and software design	2.5	X, Y generation	Male
Interviewee 8	Junior engineer	Technical expertise in IC and software design	1.5	X, Y generation	Male
Interviewee 9	Junior engineer	Technical expertise in hardware design & mechanical engineering	1	X, Y generation	Male
Interviewee 10	Junior engineer	Technical expertise in hardware design & mechanical engineering	1	X, Y generation	Male
Gatekeeper	General manager	In charge of daily management	30	Baby boomer	Male

Moreover, in terms of the characteristics of the interviewees, they had very similar ethnic and sociocultural backgrounds, as they were all native Taiwanese living and working in Changhua County in Taiwan. In all, 40% of the interviewees had expertise in IT or software design, while the other 60% had expertise in engineering and hardware design. There was also a considerable age difference between three baby-boomer workers and the other seven X, Y generation workers. The details of the interviewees are summarised in Table 4.6.

4.3.2.3 Case study 3: Company F.

The third case study was carried out at Company F², which is a medium-sized, multinational firm that produces boilers and brass valves. Currently, Company F is privately-owned and run by the founding family. The founder himself is still in control of day-to-day management. With the help of a prominent figure from Chinese National Federation of Industries, I met with the chairman to negotiate access. I interviewed five out of six of their R&D personnel to explore how they use teamwork to carry out product innovation. The head of the department had gone abroad by the time of my access and therefore was unavailable. Key characteristics of case study three are summarised in Table 4.7.

Table 4.7: Key characteristics of case study three

	Company G*
Ownership	Privately-owned by the founding family.
Role of the founding family	Founder and the second generation family members are in control of day-to-day management.
Product	Boilers, valves, brass mechanical components
Size & operational scope	Medium-sized
Time of access	January 2006
Gatekeeper	The chairman/the founder himself
Owner family's involvement in R&D operation	Owners have no direct participation but oversee the progress of R&D projects closely.
Size of the R&D department	6
No. of interviews	5
Composition of the R&D department	Homogenous (all members are technicians)
Functional background	R&D managers, senior engineers and junior engineers
Ethnic background of the interviewees	All of them are native Taiwanese who live and work at the ChangHua county, which is the smallest county in Taiwan and is located in the centre of the Westside.

* Code is used to protect the confidentiality of the participating company.

Like the interviewees in other two case studies, the five participants in this study were also native Taiwanese living and working in Changhua County in Taiwan. There was also a considerable age difference between the three baby-boomer workers and two X, Y generation workers. The details of the interviewees are summarised in Table 4.8.

Table 4.8: Information about the interviewees of case study three

	Job title	Functional background	Tenure	Age group	Gender
Interviewee 1	Senior manager	Technical expertise in product design; in charge of R&D operation	29 Years	Baby boomer	Male
Interviewee 2	Senior technician	Technical expertise in product design	25 Years	Baby boomer	Male
Interviewee 3	Senior Technician	Technical expertise in product design	15 Years	X, Y generation	Male
Interviewee 4	Junior technician	Technical expertise in product design	3 Years	X, Y generation	Male
Interviewee 5	Junior technician	Technical expertise in product design	4 Months	X, Y generation	Male
Gatekeeper	CEO	In charge of the day-to-day management	40 years	Baby boomer	Male

4.4 Data Analysis: A Grounded Theory Approach

By interviewing individual R&D team members in three manufacturing family firms in Taiwan, I collected context-rich data about how individual team members feel about working in teams and how they work collectively for the sake of product innovation. These individual interview records were analysed via a grounded theory approach which is one of the most commonly used data analysis methods in qualitative research (Addison, 1999; Benoliel, 1996). Although there are many qualitative data analysis

methods available, such as content analysis⁷ (e.g. Berg, 1998), template analysis (e.g. Crabtree & Miller, 1999; King, 1998, 2004b), analytical induction (e.g. Johnson, 2004), and cognitive mapping (e.g. McDonald, Daniels, & Harris, 2004), these may not be suitable techniques for exploring teamworking in CFBs. As an alternative to these approaches, I used a ground theory approach. This approach is designed for developing theories to 'explain how social circumstances could account for the behaviours and interactions of the people being studied' (Benoliel, 1996, p.413), or to develop 'a theory closely related to the context of the phenomenon being studied' (Creswell, 1998, p.56). As this research also seeks to tailor a culturally-appropriate theory to explain how CFB R&D teams work for product innovation in reference with CFBs' organisational contexts, grounded theory's inductive nature and its emphasis on understanding social interactions in their natural context should be most suitable.

Even though grounded theory is widely used in qualitative research, researchers are disputed over data analysis procedures in grounded theory (Dey, 1999). Even the founders of the original grounded theory — Glaser and Strauss (1967) — later parted ways to propose their own versions of grounded theory. As a result of such disputes, there are several grounded data analysis approaches proposed by various researchers. For example, derived from the original grounded theory, Glaser (1978, 1992) described data analysis in grounded theory as 'theoretical coding', which consists of three steps. The first step in data analysis is 'open coding', in which researchers go through texts and develop categories or abstracted theoretical concepts to represent emerging themes in the selected texts. After going through data and assigning categories to selected texts, the

second step is to connect and link categories to establish theoretical frameworks. Finally, researchers choose 'core categories' to link categories and texts in order to come up with a focused explanation or a theoretical narrative to sum up the findings. Even though this set of guidelines may have credibility, since it is proposed by one of the founders of grounded theory, Dey (1999) has criticised it as 'unclear' and 'ambiguous'.

On another front, the other co-founder of the original grounded theory Strauss in his collaboration with colleague Corbin (Strauss & Corbin, 1990, 1994, 1997) described data analysis in grounded theory as 'coding procedures', which can also be divided into three steps: (1) open coding, followed by (2) axial coding, and/or (3) selective coding. In this set of guidelines, data analysis also starts with open coding in which researchers assign categories, abstract theoretical concepts or codes to texts. But unlike other grounded theorists (e.g. Dey, 1999; Glaster, 1992) who argued that categories and codes should only be allowed to emerge naturally via the process of going through texts, Strauss and Corbin (1990) suggested that researchers can also use a list of predetermined coding themes (e.g. pre-selected theoretical concepts identified in literature) to help them speed up the coding process.

After open coding, Strauss and Corbin's (1990) second-step axial coding is rather different from Glaster's (1992) proposed second step. In axial coding, researchers do not just link and connect all categories/codes identified through open coding, but they also reorganise raw data in new ways to help them construct theoretical narratives or explanations. Data analysis may then end with axial coding, or researchers can choose to go further with selective coding which is 'the process of selecting the core

category, systematically relating it to other categories, validating those relationships, and filling in categories that need further refinement and developments' (Strauss and Corbin, 1990, p.116). In a way, Strauss and Corbin's approach is quite different from the original grounded approach and not surprisingly, it has drawn criticism.

For example, Wilson and Hutchinson (1996) criticised Strauss and Corbin's (1990) suggestion of using pre-established coding theme and rigid coding processes as 'deviating' from the key principles of original grounded theory. Similarly, Glaster (1992) argued that using pre-established coding theme would encourage researchers to 'force' data to fit a theory because by using pre-selected coding theme, they would focus on looking for data relevant to the pre-selected variables/codes, rather than letting theoretical concepts emerge naturally from the data. Dey (1999) also argued that Strauss and Corbin's (1990) notions of axial coding and selective coding were 'less exciting and more controversial' because 'they involve the introduction of a particular coding paradigm and the imposition of a more focused and structured discipline on the coding processes' (p.113).

Besides these two sets of guidelines proposed by the founders of grounded theory, other researchers have offered alternative approaches such as Dey's (1993, 1999) five steps approach and Auerbach and Silverstein's (2003) six steps approach. Dey (1993, 1999) improvised the original grounded theory and the subsequent works proposed by the founders, and proposed two sets of more clearly defined guidelines on how researchers should approach qualitative data analysis. According to him, qualitative data analysis can be divided into five key stages: (1) first, read and annotate data, then (2) assign categories, which is followed by (3)

linking and connecting categories, after that (4) collaborate theoretical propositions, and finally (5) produce a theoretical narrative or a theory to explain the findings (Dey, 1999). In a way, Dey's data analysis approach is a rather comprehensive, in-depth and theoretical approach as compared to Auerbach and Silverstein's (2003) more illustrative, hands-on version of grounded data analysis.

According to Auerbach and Silverstein (2003), qualitative data analysis as 'theoretical coding' can be divided into three key parts and each part contains two steps. As illustrated below, Auerbach and Silverstein (2003) suggested that qualitative data analysis procedures are:

Part A. 'Making the text manageable'

Step 1: 'Explicitly state your research concern and theoretical framework.'

Step 2: 'Select relevant text.'

Part B. 'Hearing what was said'

Step 3: 'Record repeating ideas by grouping together related passages of relevant text.'

Step 4: 'Organize themes by group repeating ideas into coherent categories.'

Part C. 'Develop theory'

Step 5: 'Develop theoretical constructs by grouping themes into more abstract concepts consistent with your other framework.'

Step 6: 'Create a theoretical narrative by retelling the participant's story in terms of theoretical concern.' (Auerbach & Silverstein, 2003, p.44-73)

Besides being practical and easy to understand, this set of guidelines is also highly compatible with NVivo, which is a software package designed for analysing qualitative data. NVivo can assist qualitative researchers to assign

and organise selected texts with 'codes' digitally and develop to theoretical frameworks or 'category strings' (Gibbs, 2002).

In this study, the data (i.e. the interview records collected from interviewing R&D team members in the three manufacturing CFBs) were analysed by using a mixture of Dey's (1999) approach and Auerbach and Silverstein's (2003) approach with the aid of NVivo programme. The data analysis procedures were divided into five steps:

Step 1: Transcribing and organising transcripts into NVivo projects

Step 2: Selecting relevant texts, developing and assigning categories

Step 3: Identifying repeating themes and ideas

Step 4: Linking repeating themes and organising themes and categories into theoretical constructs

Step 5: Producing a holistic account to re-tell participants' stories.

The next section will give more details on each data analysis procedure.

4.4.1 Data Analysis Step 1: Transcribing and Organising Transcripts into NVivo Projects

After conducting interviews in the field, interview records, which were recorded via digital recording equipment, were each given a code name and transcribed from audio files to written records, and then added to NVivo. The procedures for labelling and transcribing were straightforward but it may be worth mentioning that all the transcripts were transcribed in the original languages used in the interviews. The conversations were carried out mainly in Mandarin, while some interviewees used the Taiwanese dialect, Japanese and English terms. Languages are not just tools we use to organise

'thoughts' and communicate – they can also have influential effects on how we make sense of things across cultures (Kim et al., 2006; Peng & Nisbett, 1999). This is why indigenous psychologists believe that it is important to understand people in their own context as well as in their own terms and languages (Adair, 2006; Kim, 2000). In order to gain a better understanding and to prevent 'lost in translation', the interview records were kept in their original format and analysed mainly in Mandarin. The results were written up in English for reporting purposes and the selected statements presented in the report were translated from Mandarin to English.

As this study is a modest self-funded doctoral project, it was not feasible to translate all the data into English or to translate the results and the selected statements written up in English back to Mandarin because this would require a large sum to be spent on hiring translators and proof-readers. Another reason for not translating the data and back-translating the results and the statements written in English is that this technique may serve little utility for safeguarding the validity and reliability of the interpretation. For instance, researchers may not be able to capture the true essence of the interview data if they were to be analysed based on the translated version given the 'lost in translation' phenomenon. Many researchers (Schaffer & Riordan, 2003; Segall et al., 1990; Triandis & Brislin, 1984) have pointed out that translation and back-translation techniques cannot guarantee semantic equivalence as there are words of which no direct translations or direct translations will not make sense. Therefore, it would not make sense to spend a five-figure sum on a technique which provides little benefit. Instead of hiring translators to translate the bulk of the data or to back-translate the findings, I have hired a proof reader to

proof read the translation and to review my interpretation for the sake of reliability. The proof reader speaks English and Mandarin as native languages and has a Master degree in human resource management obtained in a top-tier English university so that she has the right sort of lingual and subject expertise for evaluating the linguistic rigor of data-analysis.

4.4.2 Data Analysis Step 2: Developing and Assigning Categories

After the interview records were transcribed, the next step was to go through all the texts and let the themes/concepts emerge naturally from the data, while developing and assigning 'categories' or 'codes' to the selected texts in the process, which is known as 'open coding' (Glaster, 1978). This process was done by selecting texts and assigning them to 'free nodes' and 'tree-nodes' in NVivo. This procedure of developing and annotating categories marks the initiation of data analysis and it serves two important functions: (1) connecting conceptual interpretations with empirical data, and (2) reducing data into manageable chunks by segmenting into categories (Dey, 1999).

As explained earlier, grounded theorists dispute how qualitative researchers should develop categories/codes. On the one hand, Strauss and Corbin (1990) as well as Crabtree and Miller (1999) all recommended that researchers can use a predetermined coding plan to speed up the coding process and focus on information related to the core research concerns. On the other hand, Glaster (1992) and Wilson and Huchinson (1996) argued that codes or categories should only be allowed to emerge gradually from the data instead of predetermined coding theme which is a

deviating from grounded theory's inductive nature. This is because with a predetermined coding theme, researchers may only look for evidence or passages which are related to the pre-selected concepts. Via this approach, researchers are forcing data to fit predetermined hypotheses or coding theme rather than letting the data guide the data analysis. I did not use predetermined coding themes because I wanted the data to speak for itself by allowing the codes to emerge naturally rather than forcing the data to fit predetermined assumptions (i.e. researchers' bias or hypotheses).

I used my 'subjectivity' as a research tool to develop codes and segment data in this early stage of data analysis. As Auerbach and Silverstein (2003) pointed out, 'subjectivity, interpretation and context are inevitably interwoven into every research project' (p.77). In quantitative studies, researchers use their subjectivity to develop hypotheses. Conversely, in qualitative studies, researchers use their subjectivity as an analytical tool to interpret meanings and decipher complex phenomena (Drapeau, 2002). Unlike quantitative studies, in which researchers can use different statistical tests to justify researchers' subjectivity (e.g. hypotheses) and to validate research findings, there is no such standardised procedure in the qualitative approach. Some scholars suggest that for the sake of reliability and validity, researchers should acknowledge openly the use of subjectivity as a research tool, while giving clear descriptions about how subjectivity is used to analyse data in a systematic manner (Auerbach & Silverstein, 2003; Berg, 1998; Dey, 1993). In this study, the researcher's subjectivity was used to code the data based on three rationales. First, I used my academic training to link the data with theoretical concepts previously studied. For instance, I assigned the following passages with theoretical concepts such as conformity,

communication, leader-subordinate interaction, and the role of knowledge and expertise, as these concepts are relevant to what was said.

'If I do not agree with my superiors, I may share my thoughts. It depends on the situation and on the ideas really. But I would not try to persuade them or stubbornly insist on my ideas. I will respect their ideas and prioritise their ideas. After all, they have been working here for several decades and they have lots of expertise in design' (interview record: #0304).

Second, I used my personal experience as a cultural insider to interpret what was said and to develop or assign codes to the selected passages accordingly. I also have good knowledge about growing up and working in the context of a CFB as my parents both work for their own birth family and have asked me to help out in their firms from a young age. Therefore, I used my own experience to assign the following passage with the codes such as 'concern for interpersonal harmony' and 'effects of sociocultural value'.

'If everyone can try to manage harmonious work relationships with each other, then we can all work together smoothly' (interview record: #0210).

Third, I developed codes/categories to represent case-specific or context-related themes from my understanding of the data. For instance, many interviewees mentioned that their company uses a 'proposal-appraisal panel' policy, which is used to encourage employees to share their thoughts via a monthly competition of written proposals for changes.

Moreover, I was the only person who analysed and coded the interview data. Even though some researchers argued that employing multiple coders may help to minimise researcher's bias (Alvesson & Karrenman, 2007;

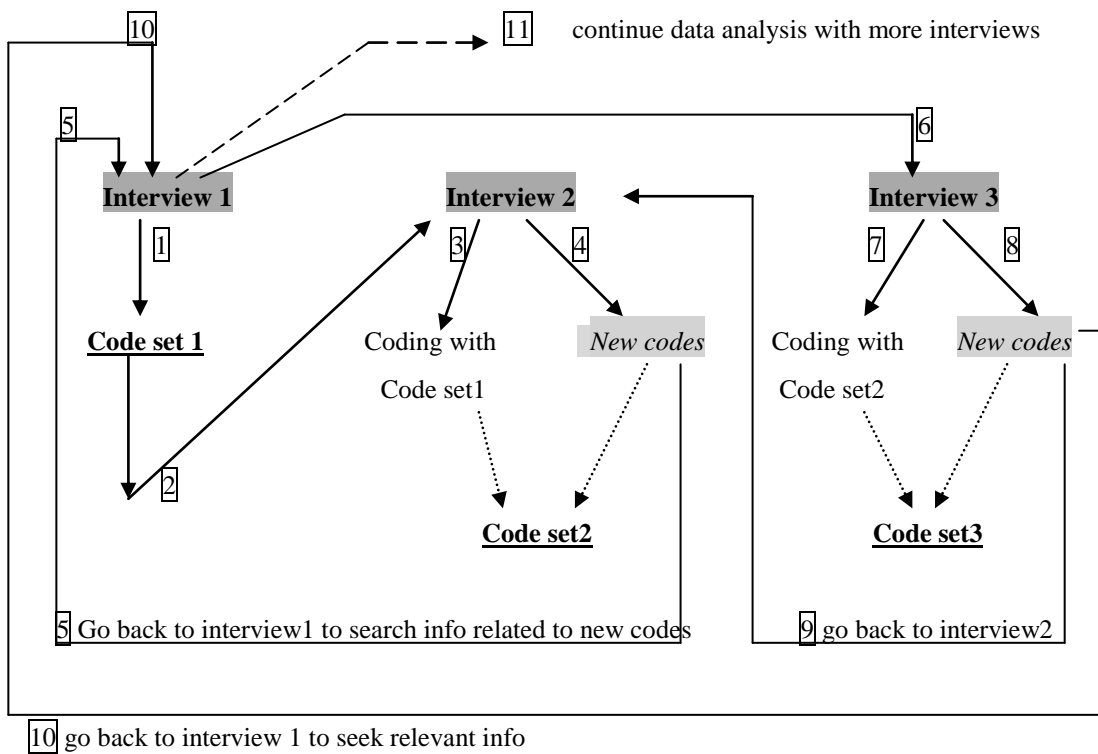
Drapeau, 2002), I did not hire research assistants to code/analyse the data for the following reasons. First, as this study seeks to understand teamwork for product innovation in CFB teams via a cultural insider perspective, having other researchers, who did not have the right sort of knowledge (e.g. cultural insider knowledge, speak the same language) and had very different theoretical standpoints, to code the data was unlikely to achieve better comprehension of the data. According to Pratt (2009), 'having someone else code your data does not necessarily make it valid' (p.859). This is because they may not be able to analyse/understand the data collected by someone else adequately, if they are not familiar with the research concerns, the research context and the data. Second, it would be very difficult to find a suitable second or third coder, who has the right sort of knowledge and expertise (e.g. knowledge about CFBs) and would adopt similar theoretical and philosophical propositions (e.g. indigenous psychology and symbolic interpretive paradigm), to participate in the data analysis. Finally, even if it were possible to hire a research assistant who had the right sort of knowledge and expertise as the second coder to help out with the data analysis, this was not a feasible option for this project. Practically speaking, it would be unrealistic to expect established researchers to participate in analysing context-rich interview data for free, given that qualitative data is very time- and effort-consuming. Hiring experienced research assistants to aid data analysis requires a sizeable budget, which is simply unaffordable for this modest self-funded doctoral project.

Instead of hiring a second coder, I used data triangulation and case triangulation for the sake of enhancing the comprehensiveness of the data and the validity of the interpretation. Basically, this means that the

theory/interpretation derived from analysing the data was confirmed via replicable results across all the case studies and by cross-referencing different data sources (e.g. interview statement versus objective statistics such as turnover rate and profit margin) (Annells, 2006; Baxter & Jack, 2008; Jonsen & Jehn, 2009; Wilson & Hutchinson, 1991).

In addition to triangulation, I also used a systematic approach towards coding and data analysis for the sake of validity and the reliability of the coding/analysis processes. The process of developing and annotating categories is not a linear, straightforward process but an iterative and complex process. According to Borkan (1999), the analysis of qualitative data is like 'multilevel roller-coaster rides', on which researchers find themselves going back and forth in the attempt to identify, connect, and interpret theoretical concepts within the descriptive data. As illustrated in Figure 4.1, the development and annotation of categories are like iterative spirals in which the categories/code sets are constantly refined and expanded as the researcher going through more data and moves from different data sets.

Figure 4.1: Grounded data analysis processes as iterative spirals



Note:

1. The term 'code' here means categories or theoretical concepts developed as abstracted interpretations of the selected texts. The code set means a collection of codes or categories accumulated after analysing an interview record.
2. 1, 2, 3...represent coding steps whereby 1 represent the first coding step, 2 represent the second coding step, and so on.
3. Steps 3 & 4 or steps 7 & 8 happen simultaneously. In step 3 or 7, the researcher goes through a new interview record with the existing code set, which was developed from analysing the previous interview record. Meanwhile, steps 4 & 8 means that new concepts/categories continue to emerge as the researcher covering more data. New codes were then added to the existing code set to formulate a new code set.
4. In steps 5, 9, and 10, the researcher goes back to previous interview records to re-examine whether there were data relevant to the new codes.
5. Step 11 and onward means that the researcher continues iterative data analysis with more interview transcripts.

As shown in Figure 4.1, after coding the first interview record, the researcher will develop the code set 1. When data analysis proceeds with the second interview, this code set 1 can provide directions for similar information or concepts. Meanwhile, new concepts/codes continue to emerge and these new codes/categories are then added to the existing code set. The new codes combined with code set 1 then become code set 2 which provides directions for analysing subsequent interview data. When new codes/concepts are identified, it may be necessary to go back to previous interview records to seek or compare relevant information. Therefore, the researcher will be going forward and backwards between different interview records to look for relevant information while new codes/concepts continue to emerge. Such 'coding spirals' continue until the research has gone through all the transcripts.

4.4.3 Data Analysis Step 3: Identifying Repeating Themes and Ideas

After going through all the interview transcripts with the coding process, the next step is to look into recurring themes and ideas. Via NVivo, this can easily be done by reviewing 'nodes' (i.e. categories or theoretical concepts) and reviewing what was said about each node/category. Besides focusing on each node/theoretical concept, repeating themes were also reviewed via 'data matrices', which 'essentially involve the crossing of two or more main dimensions or variables (often with sub-variables) to see how they interact' (Milles & Huberman, 1994, p.239). In these matrices, data were 'put back' and rearranged in a highly illustrative visual manner to enable what Milles and Huberman (1994) described as 'exploratory eyeballing'. For example, what was said and who said it about processes involved in product

innovation can be illustrated in tables. These data matrices not only help to compare and contrast who said what, but they can also help to refine interpretations of how events surrounding product innovation unfold. The repeating themes that emerged from coding/interpreting the interview transcripts were also compared with or linked to secondary data such as financial reports and other statistics (e.g. numbers of the new products developed or turnover rate). The use of multiple data sources or data triangulation may help to enhance the validity of the interpretation.

4.4.4 Data Analysis Step 4: Linking and Organising Themes and Categories to Develop Theoretical Frameworks

After annotating selected texts with abstracted categories, and the subsequent deep exploration of what was said about each of these repeating categories, the next step in data analysis was to organise repeating themes and categories into abstracted theoretical frameworks or 'category strings'. Organising categories and developing a theoretical framework requires solid understanding of the data, so it can only be done after going through the data thoroughly. Dey (1999) described this process of linking categories as interweaving different threads into a complete conceptual framework. For instance, after identifying different phases of product innovation at the onset of data analysis (i.e. coding process), and comparing what was said about different stages of product innovation (i.e. identifying repeating themes and ideas), 'threads' about the product innovation processes were then 'woven' into coherent frameworks. Such coherent theoretical frameworks can provide abstract visual illustrations of how product innovation processes

unfold in each case study. Milles and Huberman (1994) suggested that theoretical frameworks or networks are great for reporting the findings of qualitative studies because they are 'case-oriented, systematic' approaches used to 're-create the "plot" of events over time, as well as showing the complex interaction of variables' (p.239).

4.4.5 Data Analysis Step 5: Producing a Holistic Account to Retell

Participants' Stories

Data analysis was stopped at the point of theoretical saturation, which is the point 'where no further conceptualization of the data is required' (Dey, 1999, p.8). After reaching theoretical saturation, the research is then concluded with the production of holistic accounts to report the findings of each case study. These holistic accounts consist of 'theoretical constructs' and 'theoretical narratives' derived from data analysis. According to Auebach and Silverstein (2003), a theoretical construct is 'an abstract concept that organizes a group of themes by fitting themes into a theoretical framework' (p.67), whereas a theoretical narrative 'integrates the subjective world of people's experience with the abstract world of theory' (p.73). The following three chapters give three holistic accounts, each of which explains how R&D teams carry out product innovation in a manufacturing family firm and team dynamics behind these teamwork patterns. Theoretical narratives with segments of interview statements to support the interpretation were used to re-tell the stories of how product innovations unfold and the teamwork patterns in each case study. Besides descriptive narratives, theoretical frameworks or theoretical constructs are also used to give visual illustrations

to summarise findings in an abstracted manner.

In addition to three heavily described case studies, I also compared and contrasted similarities and differences across the case studies. As explained earlier, I used a multiple-case study design based on a case-triangulation rationale. As Jonsen and Jehn (2009) noted, triangulation is often used by researchers to eliminate or reduce biases, increase the reliability and validity of the study and enhance the comprehensiveness of the findings (p.126). By comparing similarities and contrasting differences between and across cases, researchers may refine their theory and interpretation, and thus make their findings more generalisable (Baxter & Jack, 2008). A cross-case review of the three case studies is discussed in Chapter 8, in which an empirical framework and a set of collaborating interpretations are presented to explain the overall findings of this study. Besides repeating themes, I also reviewed two key differences across the cases: (1) different levels of the controlling family's involvement in the management of R&D operations and (2) different levels of training offered to R&D personnel. These variances also provide vital clues about what works and what does not work when it comes to working and innovating in CFB teams.

4.5 Chapter Summary

In this chapter, I have explained how this study was carried out, taking into consideration the overall methodology, data collection approach, selection of the cases, and data analysis procedures. The first part of the chapter explains why qualitative case studies were used as the methodology. As explained earlier, this study seeks to explore teamwork for product innovation in the unique setting of Taiwanese family firms from an

indigenous psychology perspective, so a qualitative case study approach would be an ideal means to achieve this goal. The qualitative approach as a 'naturalistic inquiry' is highly compatible with indigenous psychology's core theoretical propositions, as they both seek to understand phenomena in their natural settings from an insider's (i.e. research participant's) perspective (Kim & Hwang, 2005). Case studies are ideal means for studying bounded systems such as teams and for exploring complex processes like product development processes (Yin, 2003). Based on a combination of replication and case triangulation rationale, a multiple case study design was employed and a total of three case studies were carried out. Compared to a single case study design, multiple case study design can be more robust and may help to improve the validity and generalisability of findings, as researchers can refine interpretations by comparing differences and similarities across cases (Eisenhardt & Graebner, 2007; Herriott & Firestone, 1983; Sullivan & Ford, 2010).

The second part of the chapter explains why in-depth interviews were used as the data collection strategy and gives details of the interview plan. Even though a survey design, which is commonly used in team research, is also a feasible option, the quality of data collected through surveys can be worrying – given the response set syndrome (C.-F. Yang, 1996) and Taiwanese participants' response bias towards questioners (J.-W. Ju, 2001; K.-S. Yang, 1982). In comparison, data collected through in-depth interviews can be of better quality, as the researcher is able to explore issues, clarify meaning and verify cause-effect relationships through verbal interactions.

The third part of the chapter explains the rationales of the sampling

strategy and gives details of how the samples were selected. The samples/cases were selected using principles of theoretical sampling strategy and the sample size was determined via theoretical saturation. There are three reasons for using this strategy instead of random sampling. First, theoretical sampling is most suitable when the target population cannot be defined in detail (Auerbach & Silverstein, 2003; Mason, 2002). This is also the case for this study, as researchers cannot agree on a universal definition of family firms (Chrisman et al., 2010). Second, given that family firms are heterogeneous in nature, it would not be feasible to collect a large sample size of all varieties of family firms to achieve empirical representativeness. Since qualitative data are very time- and effort-consuming to analyse, researchers may not be able to go through a large sample size and datasets with the same analytical sensitivity and in-depth understanding as compared to small datasets (Dey, 1999). Third, another reason for using theoretical sampling is for the sake of access. Family firms, especially Taiwanese family firms, are highly secretive entities (D. Ip, 2000), so a theoretical sampling strategy would be a more practical option compared to random sampling. By utilising theoretical sampling, I was able to focus on approaching potential samples which would fit the theoretical criteria (e.g. family firms that employ teams to carry out product innovation on a regular basis).

The concluding part of the chapter explains how the context-rich data collected via one-to-one interviews were analysed through a grounded theory approach and with the aid of NVivo. The data analysis procedures were divided into five steps. Step one was to transcribe audio files into text files and organise these transcripts into NVivo projects. In the following step two,

I went through the interview transcripts and assigned selected passages in the transcripts to codes. The development and annotation of codes serves two important functions. One is to segment data into manageable bits based on relevance to different concepts, while the other is to use codes as abstracted interpretations of what was said in the interviews. After all the transcripts were coded, the next step was to identify recurring themes, which was done by reviewing 'nodes' in the NVivo projects. The repeating themes were then organised into theoretical frameworks and narratives. Finally, the data analysis concluded by writing up holistic accounts to retell participants' stories. The next three chapters each gives an account of how R&D personnel use teamwork to carry out product innovation in a family-controlled manufacturing firm in Taiwan.

Chapter 5 Case Study One: Teamwork for Product Innovation in Company K

5.0 Introduction

This chapter is a case study, which explores teamworking for product innovation in a family-run Taiwanese manufacturer: Company K. The first two parts of the chapter give some background information about the firm and its R&D department. The third part reviews Company K's product innovation processes from a step-by-step point of view. The following fourth part looks into key issues that matter for understanding how the company's NPD teams work, including (1) how the teams are managed, (2) patterns of interpersonal interaction, and (3) training and creativity. Finally, the chapter concludes with a brief chapter summary.

5.1 Key Organisational Context

Founded by the Yang family more than four decades ago, Company K has expanded considerably from a small family firm to a large multinational company, which is now one of the leading tyre manufacturers in Taiwan. Its headquarters alone employs more than 6,000 employees. In addition to factories in Taiwan, Company K also has several overseas subsidiaries in China and Vietnam, as well as offices in Hong Kong and the USA. Although Company K has become a stock market-listed company, the founding family still has considerable ownership control over the firm. Besides ownership control, second generation family members also hold strategic positions (e.g. chairman, CEO, chief finance officer, etc.) and have centralised control over

the firm's day-to-day management. As they have expanded rapidly in the past decade, the family owners have had to adjust the way they run their business. For example, instead of having a family members-only top management team, which is common among Taiwanese family firms (Yen, 1994b), Company K's owners have hired many professional managers as senior executives (e.g. vice presidents, marketing executives). They have also invested increasingly more in R&D, marketing (e.g. sponsor an international sports event) and training.

Moreover, another key organisational context relevant to product innovation is the strategic switch from focusing on OEM operation to more innovation-driven ODM and OBM operations (interview records: #0101, #0106). This transition from focusing on OEM to ODM and OBM strategies is common among Taiwanese manufacturers (W.-w. Chu, 2009; Law, 2009; Yue-Ming, 2005). The mixture of OEM, ODM and OBM operational strategies can have a significant influence on how NPD teams develop new products, as each has a different focus. The effects of the three types of strategies are summarised in Table 5.1.

Table 5.1: Company K's Operational Strategies - a mixture of OEM, ODM and OBM manufacturing strategies

Company K	As an original-equipment-manufacturing (OEM) manufacturer	As an original-design-manufacturing (ODM) manufacturer	As an own-brand-manufacturing (OBM) manufacturer
What do they do?	<ul style="list-style-type: none"> • Produce goods (tyre) for their customers (B-to-B) based on customer's design and specification. • Traditionally as the most important source of revenue. 	<ul style="list-style-type: none"> • Design and produce goods based on customer demand (B-to-B). • As important sources of revenue. 	<ul style="list-style-type: none"> • Design and produce products, then market and sale products directly to consumers (B-to-C) or to business counterparts (B-to-B) under its own brand.
Benefits & advantage	<ul style="list-style-type: none"> • Lack of technology or know-how: by accepting OEM orders, they can access to product-specific know-how and technologies from their clients. • OEM orders can bring in short-term profits and guarantee returns for investment on existing equipment. • They can avoid marketing expenses and direct responsibility of product failure (lower operational risks). 	<ul style="list-style-type: none"> • Crucial technological support from customers that this can help to reduce risks of failure or to improve design • ODM orders too can secure short-term profits. • They can also avoid marketing expenses and direct product failure (lower operational risks). 	<ul style="list-style-type: none"> • Possibly higher profitability if its own branded products are to be successful. • Can gradually build up or strengthen corporate identity and brand image among general consumer.
Potential downsides	<ul style="list-style-type: none"> • Low profitability. • Facing fierce competitions from low labour cost countries (such as China & India) because cost-efficiency and product efficient are highly replaceable. • Little or no consumer awareness of the company as OEM maker (products are sold under customer's brand). This makes it difficult to build their own brand image with general public if they want to enter the market later with their own brand. 	<ul style="list-style-type: none"> • Low profitability (ODM profitability may be higher than OEM orders, yet may still be relatively low). • Little or no consumer awareness of the company as OEM maker (products are sold under customer's brand). This makes it difficult for them to build their own brand image with general public if they want to enter the market later with their own brand. 	<ul style="list-style-type: none"> • They are directly responsible for the success of the product, thus face much higher operational risks • Require higher marketing or distribution costs. • OBM products may compete with OEM or ODM products thus cause potential conflicts of interests with OEM or ODM clients.

OEM-related operations are relatively simple and straightforward because they only involve manufacturing goods on behalf of clients. ODM products are slightly more complicated, as they also require the design of the products in addition to manufacturing. Both OEM and ODM products are important lifelines for company K, as they bring in steady, short-term revenue. In comparison with OBM products, OEM and ODM products also have lower operational risks because they are sold under clients' brands, while company K is only responsible for manufacturing the products. In addition to steady revenue and low risk, OEM and ODM operations can also be a source of technical know-how because clients may transfer expertise (e.g. quality control measures, production technology, formula) to ensure the products meet the desired standards.

In comparison with OEM and ODM operations, which focus mainly on manufacturing, OBM products are much more complicated, as they require market research, marketing, design, distribution and post-sale services (e.g. honouring warranties) in addition to manufacturing. As OBM products are sold under company K's own brand, company K has to take full responsibility for the success or failure of this type of product, so they can be riskier as compared to OEM and ODM products. Even though OBM-type products can be more costly, as the firm also has to conduct market research, advertise and take responsibility for honouring warranties, they can also be more profitable.

5.2 Structural Traits of Company K's R&D Department

In Company K, product innovation is carried out by their R&D department in its Taiwan headquarter (HQ). This section will review three

key 'structural traits' of Company K's NPD team: (1) a parallel team structure, (2) the 'age gap' phenomenon, and (3) dual-directors.

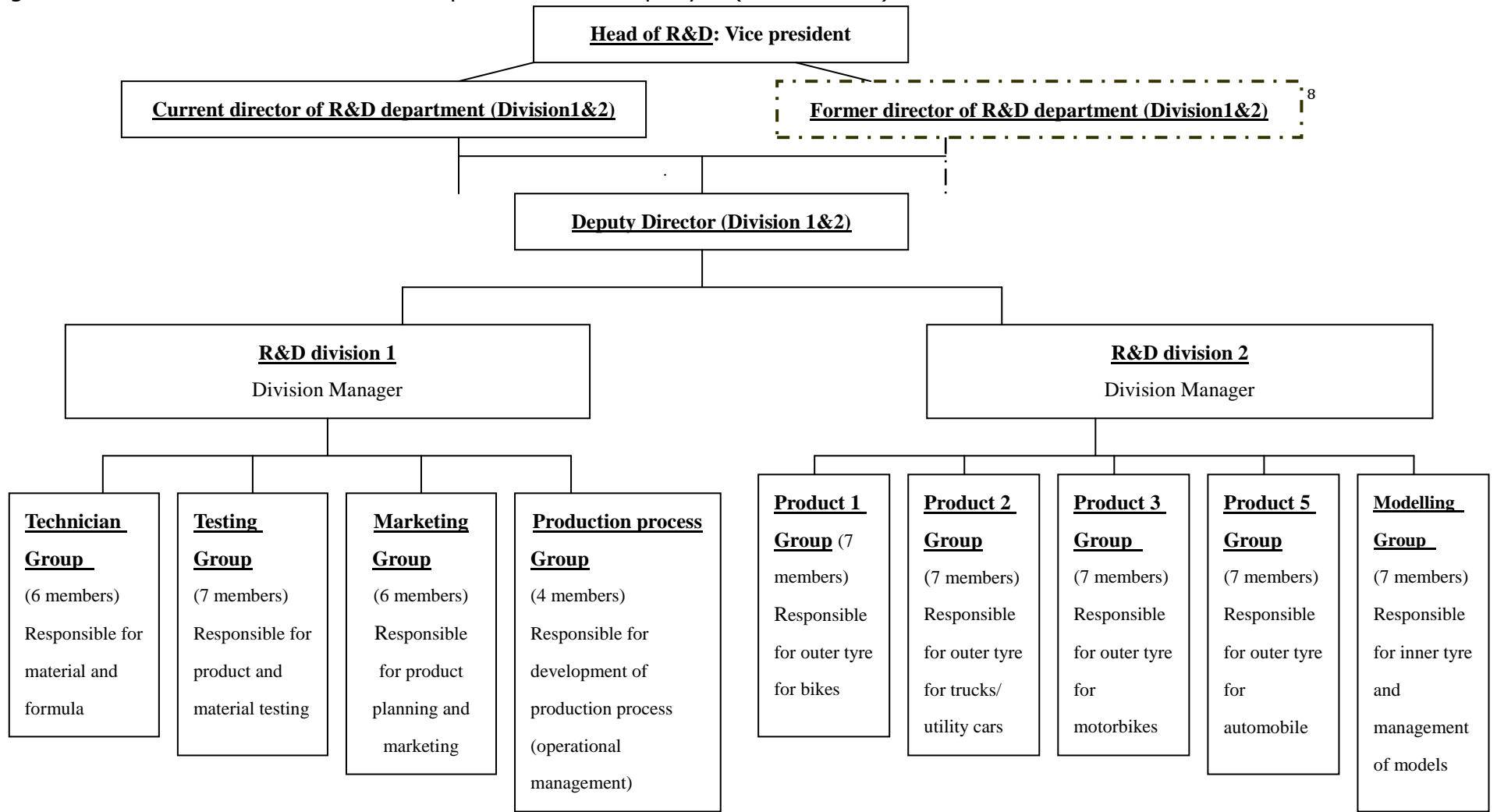
5.2.1 A Parallel Structure: Formal Structure and Temporary Task

Teams

In line with Company K's large organisational size, its R&D department is also quite big, employing more than 60 staff and still expanding. As illustrated in Figure 5.1, the R&D department has two main divisions, each of which has several subgroups. Besides a formal hierarchy, they also use temporary task teams, so the term 'team structure' can mean two different things: formal departmental structure or temporary task teams.

Generally speaking, they do not involve everyone in the whole R&D department in all NPD projects. Instead, temporary task teams are usually used to carry out NPD projects for the following reasons: efficiency, flexibility, and on-the-job training. First, a temporary task team can be much more efficient than the department as a whole, as they are smaller and thus more manageable. The sheer size of the department (i.e. more than 60 members) means that it would be impractical and inefficient to involve everyone in all NPD projects. Therefore, it is more sensible to use smaller task teams, which may have three to six members, to carry out NPD projects.

Figure 5.1: The structure of the R&D department in Company K (in late 2004)



Second, temporary task teams are also more flexible, as senior R&D executives can pick and mix talent from their in-house talent pool to suit the specific needs of different NPD projects. For example, they might need more senior personnel in more challenging projects; in contrast, less experienced rookies are allowed to participate in less challenging projects, such as improving existing products.

Third, R&D executives also use temporary task teams as a means of on-the-job training. Under the formal department structure, each NPD sub-group deals with very similar or repetitive tasks on a daily basis, so the group members of a specific group may not have much chance to learn different skills. By assigning department members to participate in different NPD project teams, senior managers may encourage their staff to learn different skills and accumulate experience. Therefore, temporary task teams are used as a low-cost, practical training tool to encourage learning and knowledge sharing in the R&D department.

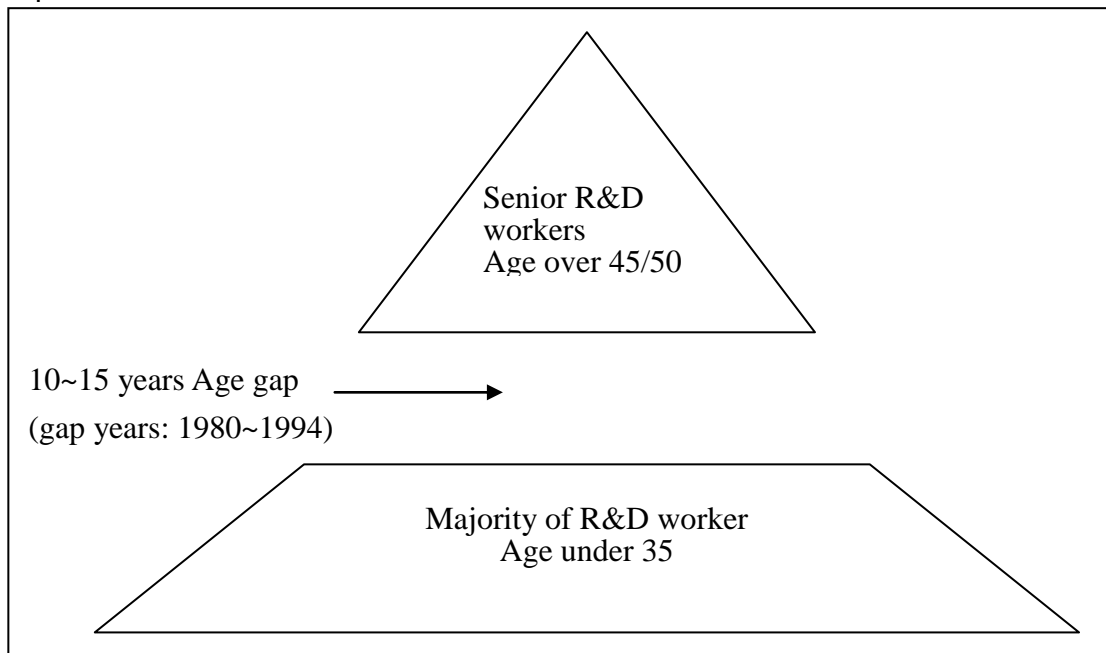
Although using temporary task teams alongside the formal hierarchal structure can be practical and flexible, the parallel structure can also have drawbacks. The main problem is that R&D personnel have to prioritise case-related tasks because they tasks are often associated with client demand. Under the customer-oriented product innovation strategy, R&D personnel have to deal with clients' demands or complaints swiftly for the sake of customer satisfaction. The competition between case-specific tasks and less urgent routine tasks can be a dilemma for R&D personnel because they cannot afford to fail. To make the matters worse, the R&D department is understaffed, so everyone has to work overtime and cope with the hefty workloads in order to make up for the shortage of manpower (interview

record: #0107, #0110, #0111).

5.2.2 The 'Age Gap' Phenomenon

Another structural trait is the considerable age gap between the older baby-boomer workers and their younger X, Y generation colleagues. High staff turnover is common among Taiwanese family firms (Yen, 1994a; G-F. Yen, 1996), and Company K is no exception. In the past few decades, especially in between 1980 and 1994, Company K's R&D department has suffered from high staff turnover (average around 20% annually) due to difficulties retaining young workers (interview record: #0102, #0104). The cause of the high staff turnover is complicated. Low wages, hefty workloads, a conservative organisational climate, and the generation gap between older baby-boomers and their younger X, Y generation colleagues, are all considered the potential causes of the high turnover among young workers (interview record: #0101, #0103, #0104, #0109, #0110). As a result of this long-lasting high staff turnover, there is a large 10-15 year age gap among R&D personnel as illustrated in Figure 5.2 (interview records: #0104, #0109, #0110)

Figure 5.2: The age gap phenomenon in Company K's R&D department



For managers, this age gap is a warning sign of their inability to retain talent on a long-term basis (interview records: #0104, #0110). For instance, three managers stated:

'To be honest with you, when I first joined the firm and started working in our firm about ten years ago (around 1994), the "technical gap" was huge then because the old technicians were retiring, whereas the newcomers just came and went. Basically, the gap between the old and young employees is huge and this has caused great pressure. So, we really want to solve this problem' (interview record: #0104).

'The age gap in our firm is quite serious. Let me put it this way: there is probably a 15-year age gap between the old employees and the younger employees. In our department it is really serious. Most R&D personnel are youngsters, but the majority of our managers are much older and waiting for retirement' (interview record: #0110).

'Our firm is moving towards having a younger workforce. Our older

workers are generally in their late 40s or 50s, and now we have hired many more young workers, who are mostly in their 20s or 30s' (interview record: #0109).

5.2.3 Dual-Directors: Transition at the Top

Besides a dual structure and a considerable age gap, another key structural trait is the transition of top leadership in the R&D department. At the time of my access, Company K was going through some management reshuffles because as was expanding rapidly, so the owners had to restructure the top management team and hire more professional executives to keep up with global expansion. As a result, the formal director, who had been in charge of the R&D departments for the past few decades, was transferred to take care of overseas investment operations. On the other hand, an experienced external consultant was brought in to take over the day-to-day management of the R&D department. Meanwhile, a young professional manager was promoted as vice director to aid the new director.

Although the daily management of the R&D department was handed over to the new director and the vice director, the former director still had considerable involvement in the making of key R&D decisions because the family owners wanted him to continue contributing his decades of experience. Hence, in Figure 5.1, he is still listed as one of the department heads. Nevertheless, the transition of headship in the R&D department does have crucial implications for how Company K manages its NPD operation. Details of the effects of the transition in top leadership will be explained in Section 5.4.

5.3 Product Innovation Processes

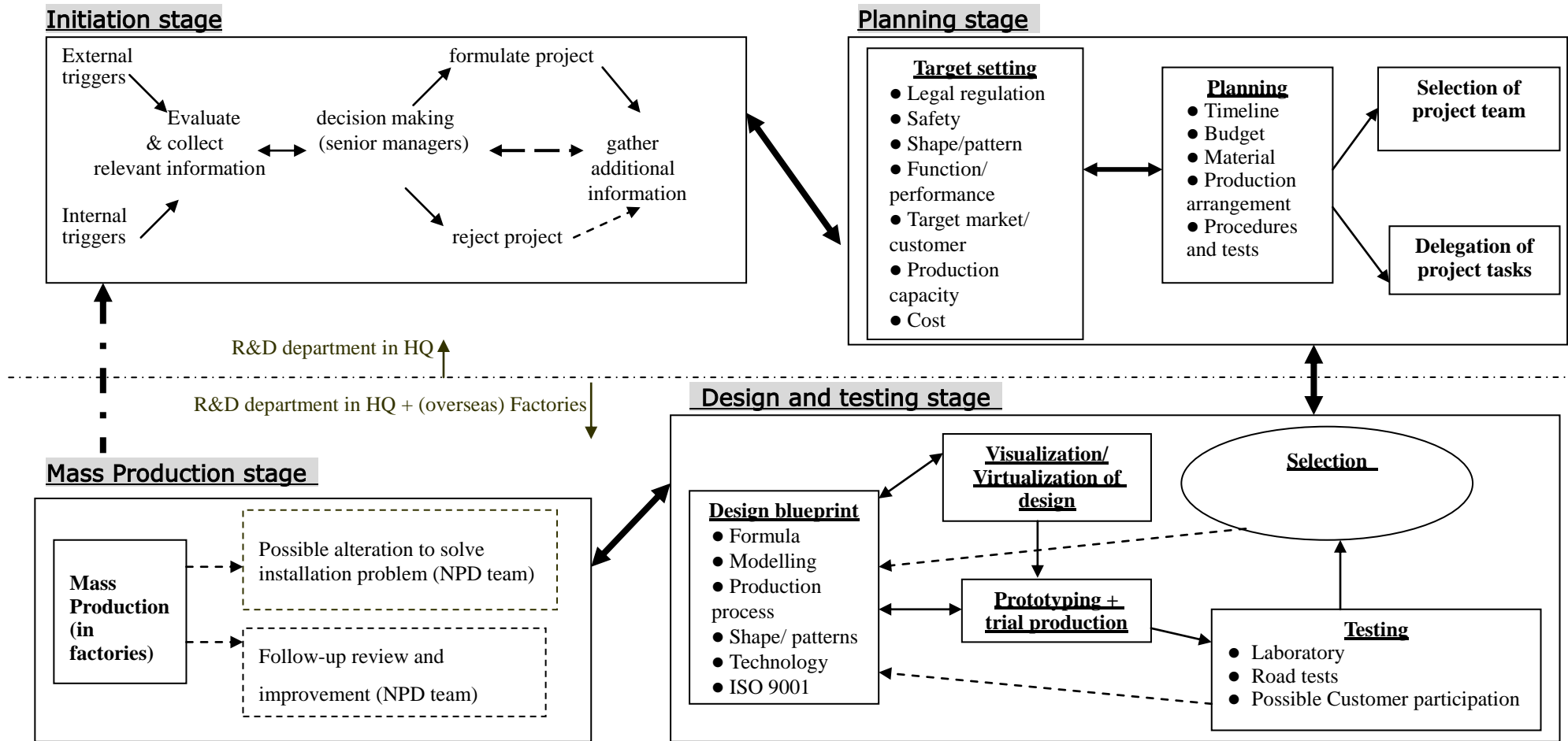
Company K has established a large product portfolio in the past four decades, so R&D personnel have to deal with many different types of products. Although the development of different products may unfold differently, similar patterns can still be found across NPD projects.

Generally speaking, the process of product innovation can be divided into four key stages: (1) the initiation stage, (2) the planning stage, (3) the design and testing stage and finally (4) the production stage. As illustrated in Figure 5.3, these different stages are likely to have iterative and complicated relationships, given the contingencies and problems that the teams will encounter throughout the process of development.

5.3.1 Initiation Stage.

This is the stage when senior R&D managers receive external stimuli or internal proposals and make decisions on whether to respond to these stimuli by initiating NPD projects. Generally speaking, most of Company K's NPD projects are driven by external stimuli/triggers such as client orders, market competition or strategic collaboration with tactical alliances (e.g. competitors, suppliers or clients) (interview records: #0101, #0103, #0104, #0105, #0106). In contrast, internal proposals (e.g. senior R&D managers' initiatives) only make up a very small proportion of the total NPD projects (interview records: #0102, #0103).

Figure 5.3: Product innovation processes in Company K



Note: - - - lines implies a possible occurrence rather than a necessity. For instance, after the modification and production stage, managers may decide to initiate a new project based on the knowledge and experience accumulated in this project; thus, the product innovation cycle may goes on, but not necessarily so..

For senior R&D managers, assessing external and internal stimuli to make decisions on whether to initiate a NPD project is not a simple, straightforward process. The decision-making process usually begins with the collection of relevant information (e.g. commodity price and economic forecast) and then critical assessments of key information against their firm's standpoints to make decisions. They would also adjust their decision based on market fluctuation or unfolding economic events (e.g. global economic downturn). Therefore the making of R&D decisions is often an iterative process between assessment, collecting data and decision-making.

5.3.2 Planning Stage.

After deciding to initiate an NPD project, the next step is to plan how they are going to carry out the project. In this planning stage, senior R&D managers or project team leaders have to set realistic goals, develop plans for the project, formulate a task team and delegate tasks to selected team members. Under the new director's 'scientific and objective approach', goals and plans have to be clearly defined from a multi-angle evaluation. Managers must take all relevant factors (e.g. legal and industrial regulation, material science, cost, existing production capacity, target customers, etc.) into consideration when trying to set sensible goals and feasible plans. In other words, NPD teams have to assess what they have (e.g. existing production capacity, budget) against what they want to achieve (e.g. radical new products for specific clients, desired profit margin) for the sake of cost-effectiveness and maximising the usage of existing equipment (interview record: #0106). After detailed plans have been drawn up, senior R&D managers then formulate a project team and delegates tasks to

selected team members.

5.3.3 Design and Testing Stage.

After team leaders have set out the plans and goals for new products, the next stage is to draw up 2D designs, run 3D computer simulations, develop prototypes, test prototypes, and finally select desired products based on the test results. Unlike the previous two stages, which are dominated by senior R&D managers, in this design and testing stage junior R&D personnel have more important roles. They are the ones who develop prototypes and run through sets of tests (e.g. laboratory testing, road-tests, trial-production, etc). On another front, managers mainly play supervisory roles such as assessing drawings and prototypes design and providing feedback accordingly (e.g. tips for solving technical glitches). Managers may sometimes participate in design tasks, especially in more complex projects (e.g. radical new products) (interview records: #0105, #0106). Moreover, in order to save time, design and testing tasks are usually divided into many different segments and are assigned to various team members to carry out simultaneously. The team members have to collaborate with each other closely, while team leaders would closely monitor individuals' progress or the overall progress of the project to ensure that different components can be assembled into complete products without delays or problems.

The development of design and prototypes is usually a rather complex and iterative process – as one team member pointed out: 'it is just impossible to get things right in every attempt, since not everyone is a genius' (interview record: #0110). In order to fix problems occurred during the development process, team members have to make several alterations,

redo drawings, or repeat all the tests. For example, under their customer-oriented product innovation strategy, senior R&D managers often invite clients to participate to in the selection of design and the testing of prototypes because clients' feedback may help them to improve the design and reduce risks (interview records: #0101, #0106, #0107). If clients are not happy about the designs or the test results, the team may have to go back to the drawing board and start over until a satisfactory result has been achieved.

Another reason why the design of new product is a very complex process is Company K's multinational operation. As it has several overseas factories, their NPD team must collaborate with their overseas subsidiaries to ensure that the new designs can be produced successfully in these facilities. Although cross-borders collaboration can be a hassle to coordinate, their R&D executives have used their complex multinational operations to their advantage to improve the success of their NPD projects. For instance, they can run simultaneous tests on prototype across a number of overseas and home-based factories to collect multiple datasets, which will help them to identify problems or compare the quality of prototypes produced by different factories (interview records: #0101, #0104, #0106). Based on these multiple datasets and comparisons, R&D managers may decide to alter a design in order to fix problems, or to change plans to relocate the production of the new products to more suitable factories in order to boost productivity or the quality of the new products.

5.3.4 Mass Production Stage.

After the prototypes have passed sets of tests, and clients and senior

R&D executives have given their seals of approval, the final stage is to hand the project over to the factories for mass production. Introducing new products to existing production facilities may seem simple and straightforward, but the production departments may encounter all sorts of problems (e.g. poor quality, failure to install or technical glitches) when trying to install new products. If their product departments are unable to resolve these issues by themselves, they have to ask the team leaders of the NPD projects to step in. In the worst case scenario, the NPD teams may even have to go back to the drawing board to re-design the product, if minor alterations are not able to resolve serious faults.

Moreover, this production stage usually marks the end of most NPD projects. However, in some cases, the experience of developing one product may inspire R&D managers to initiate another NPD project, and therefore the cycle of product innovation continues. For example, R&D managers might run follow-up reviews to evaluate the outcome/success of an NPD project and, based on their observation, may decide to apply what they have learned from developing one product on existing products by making incremental improvements.

5.4 Teamwork for Product Innovation: What Matters?

For those who work in Company K's R&D department, working in teams is a very complex matter and that there were many issues raised in the interviews. Here I will divide key issues relevant to team dynamics into three groups: (1) how the NPD teams are managed, (2) patterns of interpersonal interaction, and (3) training and creativity.

5.4.1 Team Management

5.4.1.1 The role of the family owners

Although the family owners still have very centralised control over the family firm, they do not manage the R&D department by themselves because they acknowledge that they do not have all the necessary technical competence needed for running such a complex NPD operation. They have thus hired professional managers and empowered them sufficiently to allow them to manage the NPD teams and make key NPD decisions. As top executives, the family owners may participate in the making of some key R&D decisions and keep a watchful eye on the progress of NPD projects, but they usually do not interfere directly in the NPD operation (interview record: #0103). Instead, they monitor the performance of the new products and other innovations (e.g. patents, new technology) and reward or assert executive control (e.g. restructure the R&D department, job redesign, adjust an NPD budget and resources) accordingly (interview record: #0102). The owners' trust and support can be crucial for the teams because without this support, the NPD teams could encounter all sorts of obstacles to implementing radical changes, such as power struggles and insufficient resources (interview record: #0103).

5.4.1.2 A hierarchical, top-down teamwork pattern

Like their firm, their R&D department and temporary NPD project teams are also managed in a centralised, hierarchical fashion. Under the top-down teamwork pattern, R&D managers have very concentrated power to make decisions and assert control (e.g. ask subordinates to re-do a design or take over subordinates' tasks). In contrast, junior team members would just

carry out the legwork to which they are assigned and normally do not dare to take the initiative or debate superiors' decisions (interview records: #0107, #0111). This top-down work pattern seems to work efficiently because everyone in the team accept their roles and would work hard to fulfil their responsibilities. Yet on the flipside, the hierarchical work arrangement also means that the flow of communication in the teams is largely top-down (interview records: #0105, #0107, #0111). Most of the time, junior team members just passively receive orders from the top and may only communicate with superiors or colleagues when they have problems or when they have to sort out coordination arrangements (interview record: #0107, #0111).

5.4.1.3 Transition in management approaches: from a traditional, paternalistic approach to a more systematic, project-oriented approach

As mentioned earlier, the owners have hired professional managers to replace the former director, who was reassigned to take charge of overseas operations. The new director and the vice director are professional managers and adopt very different management approaches compared to the former director, who has a rather traditional paternalistic approach. The change of top leadership was welcomed as a positive change because the former director's traditional approach has led to increasing problems (interview record: #0101, #0104, #0109, #0110).

First, the former director adopts an intuitive style of decision making and therefore sometimes gives subordinates ambiguous instructions. Even though his intuitive decisions or ambiguous instructions might be confusing

for subordinates, he used to have high levels of participation in NPD projects and therefore can detect possible problems caused by his decisions and react or adjust quickly to curb the problems (interview record: #0103). However, as their NPD operation grew increasingly large and complex, he was unable to participate in all the projects to take control and the lack of clearly defined instructions, plans, and procedures started to cause more and more problems. One manager described the former director's management approach as a 'shooting dots at random'-like approach because there was no systematic planning or guidance from the top, so R&D personnel generally had problems figuring out what they were trying to achieve in NPD projects (interview record: #0101). In order to solve this problem, the new director has introduced a more systematic, project-oriented management approach which is very different as compared to the former director's approach in at least three ways.

First, it places an emphasis on a more systematic logic on goal setting and planning. Instead of the previous approach in which decisions are largely made on the basis of intuition, R&D managers are asked by the new director to conduct research and evaluate relevant information from different angles when making decisions and developing plans (interview record: #0101, #0105). Senior managers would lay out overall goals (e.g. long-term and medium objectives and plans), and then based on these overall objectives, middle and first line managers then come up with more detailed plans, schedules and job designs to provide detailed, clearly defined guidance for their fellow team members. The coherency between overall goals and detailed work plans combined with the clarity of instructions are crucial for the success and efficiency of NPD projects because they are vital

forms of guidance for the team as a whole. Besides systematic planning, the new director has also established sets of clearly defined operational and testing procedures. The idea is to treat NPD projects as scientific projects and to use scientific testing to examine the performance, consistency and quality of designs and products (interview record: #0105). Such standardised operational and scientific tests are beneficial for improving the quality and reliability of products (interview record: #0101, #0103, #0105, #0104).

Second, the former director bonds and socialises with subordinates closely, and such a family-like close bond may help to motivate subordinates or compensate for the lack of clearly defined goals and instruction (e.g. they know what to do, since they know each other very well) (interview record: #0103, #0106). In a way, such a close bond is common among the employees and a manifestation of their company's family firm atmosphere (interview record: #0109). However, the culture of close interpersonal bond, or Guanxi, has led to problems such as differential treatment and abusive use of interpersonal connections (interview records: #0104, #0109). For example, one manager pointed out:

'Our CEO is like a benevolent father figure. That is great, but sometimes it seems that he lacks authority or an intimidating character. Our former director is just like him (the CEO). The director interacts with the CEO like best mates or brothers. As a result, administrative efficiencies are often impaired because of this family-like approach. For instance, **colleagues may use their Guanxi (i.e. personal bond) with the CEO or their connection with the former director as excuses to delay orders or ignore deadlines.** They might say: "I am a close friend of the CEO/ the director, so it would be OK if I miss the deadlines". Or they may say: "I am a good friend of the CEO, why do you think you can order me about? Don't you

know I am closer with him (the CEO) than you are?" These situations used to happen on a regular basis. Now, we do things differently... We evaluate things case by case, objectively, to keep them on track' (Interview record #0109, emphasis added).

In order to curb problems caused by this culture of 'Guanxi', the new director has introduced an objective, project-oriented review to keep track of NPD projects. For example, under company K's MBO policy, everyone is given sets of responsibilities and their performance is measured against these responsibilities on a case-by-case basis (interview records: #0104, #0106, #0110, #0111). This performance-oriented management approach is considered fairer, more objective, and efficient because it helps to keep things on track and motivate subordinates. One manager explained:

'I personally much prefer a more objective, egalitarian style of management over the traditional approach. I will give you what you need but I will also demand that you deliver results. I will treat everyone exactly the same and be fair and objective. This would put pressure for my subordinates to perform well but this pressure is shared from top to down. ... Although it seems that I am being quite strict, I believe that my subordinates do accept such an objective style... Because, so far, we seem to be able to retain young talent and the turnover rate is relatively low' (interview record: # 0104).

Third, they used to take tenure as the key criterion for promotion, but now they promote people based on individual performance (interview record: #0109). Under this performance-oriented promotion policy, R&D managers promote young talent to senior positions quickly, which helps to motivate and retain young R&D personnel (interview records: #0104, #0106, #0109). Although researchers have pointed out that Chinese or Taiwanese managers often deliberately undermine subordinates' contributions in order to

reinforce their control (B.-S. Cheng, 1993; Farh & Cheng, 2000b), Company K's R&D managers would try to avoid such undermining behaviours because it is demoralising and can lead to high staff turnover. In order to retain young talent, they would explicitly praise subordinates' good performance and reward them accordingly (interview record: #0103, #0 104, #0106, #0110).

Judging from these differences, it seems that Company K's R&D managers are gradually switching from the traditional paternalistic approach to a more systematic, project management-oriented approach.

5.4.1.4 Leader-subordinate interaction: authoritarian but caring mentors versus their obedient apprentices.

In the past, researchers (Bond, 1991; B.-S. Cheng, 1991) have projected CFBs leaders as authoritarian father figures, who not only pay attention to subordinates' performance but also to their private life (e.g. family crises, deaths in the family). In Company K, some managers still adopt this traditional approach and they do see themselves as father figures, who pay attention to their subordinates' growth, bond with them, visit their family on a regular basis and socialise with them after work (interview records: #0103, 0106, #0110). However, others prefer a more Western, task-oriented approach, in that the relationship is kept strictly professional and the only focus is on the task, skills and performance (interview records: #0104, #0109). In addition to these two different approaches, there are also others who said that they do not have a particular leadership style and would adjust their way of managing subordinates accordingly (interview records: #0101, #0105).

Even though there are considerable differences between these R&D managers' leadership styles, all of them agree that they do act like mentors and are keen to groom young talent to become competent next-generation managers (interview records: #0101, #0103, #0104, #0105, #0106, #0109, #0110). For example, one manager pointed out:

'I hope that our young R&D personnel will gradually build up the competence needed for doing research and carrying out NPD projects. We senior managers will eventually retire and they will have to take over from us. So, I hope that they will learn as much as they can because they will have to take things over eventually' (interview record: #0105).

As mentors, these managers are keen to teach their subordinates how to design tasks, run tests and manage projects through weekly training sessions, learning by doing, and problem-solving scenarios. In return, they also expect their subordinates to deliver good performance and show significant growth and maturity (interview record: #0104, #0106). They would give subordinates plenty of autonomy or a 'stage' to encourage them to learn and apply their knowledge, creativity, and skills on their tasks (interview records: #0101, #0104). Besides teaching and giving subordinates autonomy, senior R&D managers would also give subordinates opportunities to participate in different types of tasks and an every-increasing workloads and pressure to 'speed-up' their growth (interview records: #0106, #0110).

On another front, in the eyes of the subordinates, managerial positions are still fairly much the symbols of power and therefore have to be respected. Although managers may act like caring mentors, they expect their

subordinates to do what they are told to do – without resistance or complaint. Under such role expectations, junior members generally regard showing total compliance towards superiors and working diligently to fulfil top-down orders from superiors/senior colleagues as the right thing to do (interview records: #0107, #0111). For inexperienced rookies, they are generally keen on learning techniques and accumulating experience, so they normally do not mind following superiors' instructions or colleagues' advices (interview records: #0105, #0110). Given that managers see themselves as caring mentors and perceive their subordinates as apprentices, while junior team members generally see managers as authoritarian mentors, the leader-subordinate interactions in the NPD teams can therefore be described as interactions between authoritarian but caring mentors and their obedient apprentices.

5.4.1.5 Carefully balanced autonomy and control

Under their top-down, hierarchical teamwork pattern, managers have tight controls over subordinates but they would also give subordinates plenty of autonomy, which is essential for doing design work and learning from trial and error (interview records: #0101, #0104, #0105, #0106, #0110). For example, two managers explained:

'You know, nowadays, young engineers often have strong subjective points of view and they do not like being told what to do or being given repetitive routine tasks. They love challenges, especially technical challenges such as new technologies. I know that I cannot be always right, so I let them try their own ideas. Therefore, normally I would leave the tasks to them to let them try their own ways. If they have problems, they can always come to me for help. ... Even though I feel that work efficiency suffers when I leave them to try, I think this is a necessary process to help them

learn. ... I kept saying to my team members: our firm can provide you with a stage but it is entirely your choice what you want to do with it' (interview record: #0104).

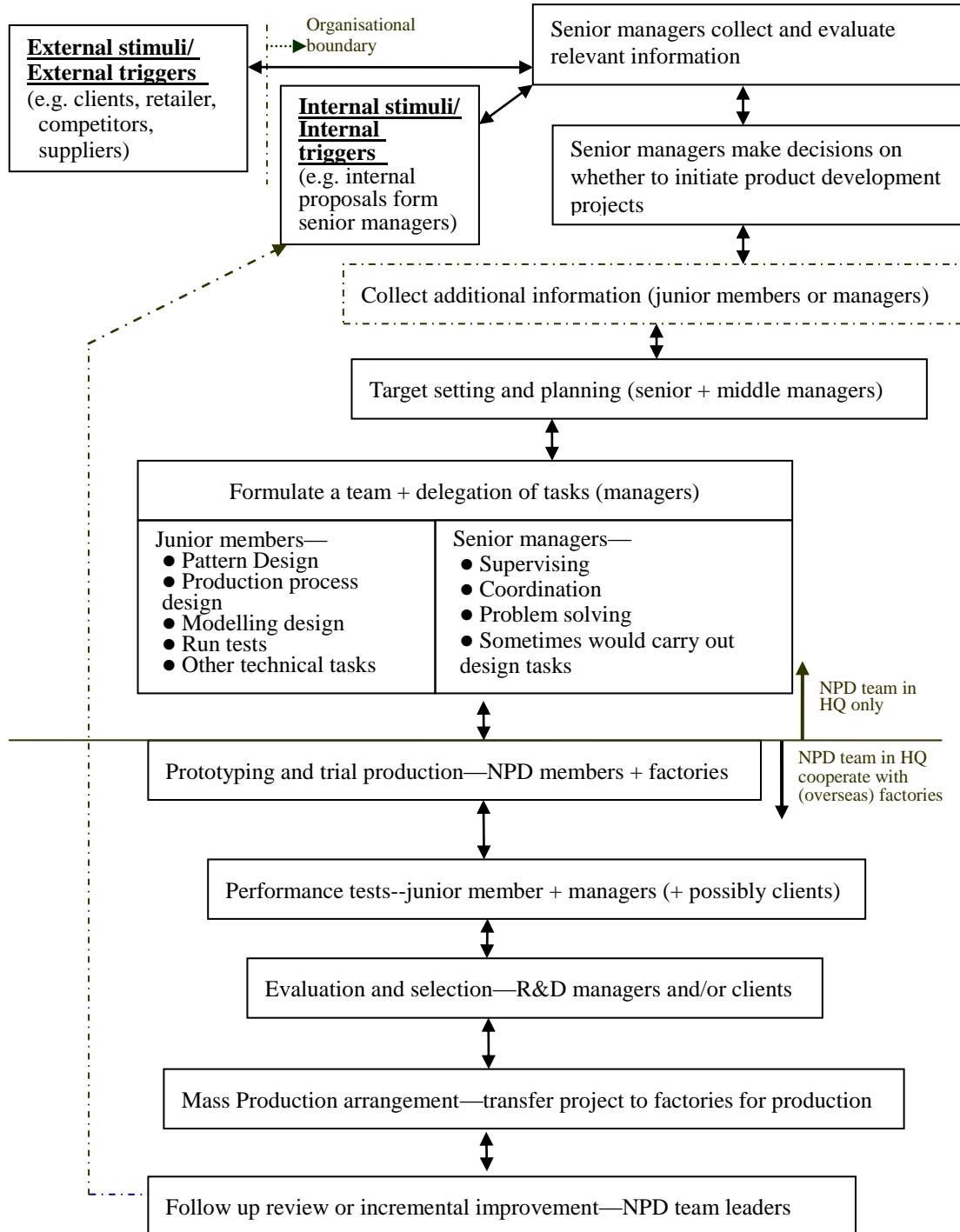
'Take our rookies as an example – we would give them directions and some space to let them be creative. If you give them space to use their own ideas and knowledge, they may make the best of their potential' (interview record: #0106).

Although giving subordinates autonomy to learn through trial and error is vital, managers also have to keep watch of their progress and intervene when necessary (e.g. takeover subordinate's tasks) for the sake of collective efficiency. For managers, balancing autonomy against managerial control can be a very delicate and tricky issue. Managers are aware of that intervening too much can hurt subordinates' feelings, so that they are cautious about when and how they intervene (interview records: #0104, #0106, #0110).

5.4.1.6 Cross-functional coordination

As mentioned earlier, there are many parties involved in the development of new products so that efficient coordination between all participating parties is crucial for the efficiency and success of the NPD projects. As illustrated in Figure 5.4, if we reconsider Company K's product innovation from a 'who does what perspective', it is clear that there are many parties involved in the complex process of product innovation. Generally speaking, coordination in their R&D department can be divided largely into internal coordination or external coordination.

Figure 5.4: Company K's production innovation processes from a 'who does what' perspective



Note: - - - line implies a possible occurrence but not a necessary one. For instance, after the modification and production stage, managers may decide to initiate a new project based on the experience accumulated in this project. Thus, the product innovation cycle may go on, but not necessarily so.

Internal coordination within NPD teams is relatively simple and less problematic because all team members share the same goals and the team leaders have greater control over fellow team members than over external parties. The team leaders as the chief coordinators would monitor each team member's progress and intervene when necessary. Given that R&D managers and team members share the same open-plan office and attend the same department meetings, they can easily sort out coordination by talking to each other face-to-face.

Besides coordinating with fellow team members, NPD teams also have to work with various external parties such as other departments in the firm, clients and suppliers. First, in terms of working with other departments, Company K's R&D department has to work closely with the sales and production departments. Although these departments share the same strategic goals (i.e. the profitability of their firm), collaboration is often plagued with conflicts of interest. The main problem is that under their firm's management by objective policy, each department is self-interested in fulfilling its own performance target, and thus can be reluctant to help other departments, if doing so may jeopardise their performance appraisal. For instance, the sales department will pressurise the R&D department to deliver new products swiftly, regardless of the fact that the NPD teams may be struggling with a hefty workload (interview records: #0107, #0110). Besides the sales department, NPD teams also have to work with the production departments/factories because the NPD teams are not given exclusive production-related machinery and thus have to 'borrow' production facilities and production personnel in order to develop prototypes

and run tests and trial production. However, production departments can be reluctant to let their machines or personnel out because they are more interested in fulfilling their own performance targets (e.g. meet production quota). The conflicts of interest or competition for resources between departments can lead to delays and demoralise young R&D personnel, who often find it difficult to negotiate with other departments given their lack of bargaining power and low hierarchical status (interview records: #0107, #0109, #0110, #0111).

Second, besides internal departments, NPD teams also have to work closely with clients given that manufacturing industry is highly integrated, and their collaboration with clients can be crucial for the success of new products (interview records: #0101, #0105, #0106). R&D managers are keen to conserve close relationships with clients (e.g. car, motorcycle and bike manufacturers), as doing so may help them to win orders and to improve customer satisfaction and loyalty (interview records: #0101, #0104, #0106). Under Company K's 'customer-driven product innovation policy', R&D managers would provide clients with various pre-sale and post-sale services in an attempt to attract order and improve customer satisfaction. For example, senior R&D managers offer clients pre-sale consultations to discuss their needs in order to come up with suitable designs (interview records: #0105, #0106). They often invite clients to participate in the development of new products (e.g. comment on the designs, and participate in the testing of prototypes). Like Lai and Chung (1995) found, involving clients in product development can help downstream manufacturers like Company K detect faults or problems and improve the design before manufacturing (interview records: #0105,

#0106). Working closely with clients not only helps to detect faults, but the interactions with clients may also inspire creative ideas for new designs or new applications for existing technology (interview records: #0103, #0105, #0106).

Although working closely with clients can be highly beneficial, clients' demands can also be stressful to deal with. The main problem is that their R&D personnel have to prioritise clients' demands and complaints for the sake of customer satisfaction, but prioritising clients' demands may interrupt their work schedules and add more stress and workload (interview record: #0107, #0109, #0110). For example, one manager pointed out:

'We not only have to develop new products, but we also have to do some extra service to satisfy clients' demands. Some of our clients are very demanding and they may say: "If you want me to buy your tyres, you have to present all relevant data, good designs, blueprints, etc.". You see, these clients' demands are endless, but we still have to take them seriously and try to satisfy them' (interview records: #0110).

Finally, in addition to working with internal departments and clients, their NPD teams also have to work with suppliers to secure the steady supply of raw materials and components. Like working with clients, collaborating with suppliers may also bring in new ideas and industrial know-how because suppliers are keen to provide industry-related information (e.g. new trends, new technology, market fluctuations) in an attempt to attract orders (interview records: #0104, #0109).

Given all these internal and external coordination activities, it is clear that product innovation can be a rather complex issue because the teams have to work with many different parties throughout the development

process. NPD team leaders would have to track everything to ensure that all participating parties know what to do and what is going on for the sake of overall efficiencies (interview record: #0101).

5.4.2 Interpersonal Interaction in NPD Teams

Besides team management, interpersonal interactions are also crucial parts of teamworking in their R&D department. Based on what was said in the interviews, there are several distinctive patterns of interpersonal interaction found in their NPD teams, including (1) a hierarchical work climate, (2) concern for interpersonal harmony and an objective attitude towards conflict, (3) communication problems caused by the generation gap, and (4) a shared sense of responsibility and a hard-working spirit.

5.4.2.1 A hierarchical work climate

Like most longstanding family firms, Company K also has a conservative, hierarchical work climate which can have a significant influence on how their R&D personnel interact with each other. Interpersonal interaction in Company K is a strictly formal and hierarchical business. For example, unlike Westerners tend to address colleagues by their first names (Hofstede, 1991), Company K's workers usually address each other by their formal titles plus last names (e.g. 'production manager Chen', 'vice president Cheng') instead of more intimate first names.

Besides using hierarchical ranking to define identity, their R&D personnel are also rather sensitive about hierarchical differences which they use as an important reference to construct behaviours. In a way, the power distance in their teams is quite large. On the one side, managers have very

concentrated power and unchallenged status and they expect their subordinates to behave obediently (e.g. carry out top-down assignments diligently) (interview records: #0104, #0106). On the other hand, junior/low-ranking team members are acutely aware of their lack of power due to their low hierarchical status and therefore would behave modestly, respectfully and submissively towards superiors or senior colleagues (interview records: #0107, #0111).

This sensitivity towards hierarchical roles combined with the presence of large power distance in their R&D department can have positive as well as negative implications for how they work and innovate. In terms of merits, the status-conscious culture helps to boost work efficiency, since everyone is aware of their roles and behaves accordingly. For example, junior team members execute superiors' decisions without question or resistance, since obeying top-down orders or compliance behaviours are generally considered 'the right thing to do' (interview records: #0107, #0110). Yet, on the flip side, the hierarchical work climate can impose high conformity pressure and undermine communication. For instance, junior members often prefer to do what they are told to do and not to express dissent or debate superiors' instructions because it would seem inappropriate to do so (interview record: #0107).

5.4.2.2 Concern for interpersonal harmony and an objective attitude towards conflicts

Although several team members pointed out that conflict or having different opinions are inevitable, they would try to avoid conflict and take an objective attitude to resolving task-related issues in order to maintain good

relationships with colleagues (interview records: #0104, #0106, #0107). For example, it is understood that everyone has their unique standpoints, responsibilities and interests, so they see things differently. One interviewee explained:

'Conflicts are inevitable, more or less... Yet, we all understand that managers or other team members have their own concerns and reasons, so that they must insist on their opinion in formal meetings for the sake of the firm or for sake of the department. We are aware that these different opinions or insistence are purely business. Yes, we have different opinions or minor conflicts in formal meetings or during discussions, but it's nothing personal. Everyone has their own standpoints and responsibilities, so that they must insist on their opinions, but we won't take it personally' (interview record: #0107).

Another team member noted that having different opinions is a good thing for the team as a whole, but managers must be able to synthesise different ideas and make the best of them (interview record: #0106). He explained:

'In fact, having different opinions is not a bad thing but a good thing, if you can manage it well. If you stop individual members from expressing opinions, their ideas and their creativity will be obstructed as well. Say, in a group of ten, we are likely to have two sets, three sets, or even ten sets of different opinions. As managers, we must consider how to coordinate different ideas and to carefully evaluate to select the best idea. As managers, it is our responsibility to coordinate and to synthesise these diverse opinions to make the best of them... Nevertheless, we don't want our team members to have open confrontations. For example, if someone lost his/her temper and is shouting, I would have to fire him/her' (interview record: #0106).

Besides taking an open and objective attitude towards task-related conflicts,

R&D personnel also take seniority into consideration, given that the department is governed by seniority rule rather than majority rule. For instance, one junior team member said that he would not dare to debate superiors' instructions because doing so may antagonise the bosses. He stated:

'Usually, decisions or orders are given to us from the top, so we usually would not disagree or debate bosses' opinions or decisions. ... It's better not to antagonise the bosses. ... If the bosses are wrong, you had better speak more euphemistically. ... Of course, we have to give the bosses some room to go backward or forward, just in case they change their minds. ... If they don't agree with us, we'll just have to back off, let them decide or set another timeline. ... I'll never ever directly confront the bosses' (interview record: #0111).

Another team member also said that he would try to express ideas and let the superiors decide as under seniority rule, managers are the only ones who can make decisions (interview record: #0109). If superiors disagreed with him, he would expect them to take responsibility for their decisions. He stated:

'I personally would express my ideas candidly because I am the one who carries out all the legwork and therefore know the situation and pros and cons of my approach very well. So, I usually would try to hang on to my ideas. Yet, my superiors may disagree with me. They may have to consider the overall situation or something like that. For example, we think option A is better but he may insist option B is better; then we have a conflict. In my opinion, they as decisions-makers can decide whatever they think is appropriate but they also take responsibility for their decisions. I think that it's ok if they do not agree with us, but we have to clarify the responsibilities. If he makes the decision, then he will have to take the responsibility.

We have accomplished our responsibilities by telling him about the situation. If we end up having problems, he would have to shoulder the responsibilities' (interview record: #0109).

Clearly, judging from these junior team members' statements, their hierarchical work climate and seniority rule have influential effects on how they perceive and deal with conflict at work. Junior team members are very cautious about what they say towards superiors and would try to clarify responsibilities when dealing with task-related conflicts in order to protect themselves.

5.4.2.3 Communication problems caused by the generation gap

As mentioned, company K's and its R&D department have been suffering from high staff turnover, which in turn has led to a considerable age gap between the team members and loss of technical know-how. The high staff turnover also contributes indirectly to the communication problems caused by the generation gap (interview records: #0104, #0110). For example, two managers pointed out that the older baby-boomers can be reluctant to acknowledge that they are at fault or to accept new ideas proposed by the younger X, Y generation worker:

'Some of the older workers, who joined our firm from the very beginning (around 40 years ago), often behave in an unreasonable manner and therefore can be very difficult to deal with. They just ignore the fine line between power and responsibilities. They can be reluctant to acknowledge that they are doing things in a wrong way. But most colleagues give them "face" and therefore are reluctant to point fingers at them and are unwilling to scrutinise them to get to the bottom of the problems. I find this hard to stomach' (interview record: #0104)

'The older generation can be reluctant to change because they think

that if the existing approaches still work, why change at all? But we youngsters believe that new approaches can work better, so why not change the way we do things?' (interview record: #0110)

In order to tackle problems caused by high staff turnover among young workers, senior R&D managers have taken actions such as offering more comprehensive on-the-job training, promoting young talent to senior positions and encouraging individual and collective learning in the R&D department (Interview records: #0101, #0104, #0106, #0109, #0110).

5.4.2.4 A shared sense of responsibility and a hard-working spirit

Company K's R&D personnel generally have a strong sense of responsibility and work hard to fulfil their duties. For example, many of them work overtime regularly and often take work home due to the pressure to fulfil their responsibilities and get things done on time (interview records: interview records: #0103, #0107, #0109, #0110). There are several causes behind this shared hard-working spirit, such as MBO policy, the hierarchical work climate, the constant shortage of manpower, and the interdependent nature of teamworking and product innovation. First, under MBO policy, everyone is assigned sets of specific responsibilities and they must complete their tasks on time for the sake of individual performance appraisal (interview records: #0103, #0104, #0107, #0109, #0110, #0111). For example, one team members stated:

'I have to work overtime (to catch up) quite often. It depends on how much I've done my own work. Our company use management by objective, so it's all about individual responsibilities' (interview record: #0111).

Second, under their firm's hierarchical work climate, managers would work

hard to set good examples and take on more responsibilities because they want to encourage subordinates to do the same (interview records: #0103, #0104, #0106, #0110). For instance, two managers stated:

'We senior managers or deputy managers do not get paid for working overtime, but we have to set the right examples for our subordinates. For instance, I used to work until the early hours of the morning with my team, just to get things done. ... If not so, how can we survive? ... I do not just say it, I do it myself. Work like hell, sleep in the office. ... To be honest, it's all about a sense of responsibility and working hard to get things done' (interview record: #0103).

'If our vice director works overtime, we have to do the same to work overtime as well. It's usually like that. In fact, I think he works overtime far more often than we do. ... Indeed, we have to work overtime all the time, including weekends. ... You know our R&D department has to share resources with the production department to do our prototypes and trial productions. ... So, we often end up spending weekends in the factories to do the prototypes as well as the tasks which are urgent. Otherwise, there's no way we can complete urgent tasks' (interview record: #0110).

Third, the R&D department has been understaffed for a very long time so that R&D personnel must work hard to cope with the hefty workloads. Several team members pointed out that they feel exhausted due to their excessive workload, but they also acknowledge that this cannot be helped because their firm has to cut down costs in order to keep up with fierce market competition (interview records: #0103, #0107, #0109, #0110). For example, one manager explained:

'Our group has been understaffed on a long-term basis, in that we used to have seven members but two were transferred to another department. I really don't get it. We did not have enough and now

we are down two people. But our workloads just keep increasing. We have to ask other groups to help us because it is just impossible to complete all our tasks if we do it alone. We have to work hard and do as much as we can' (interview record: #0110).

Finally, the interdependent nature of teamworking and product innovation is another important factor behind the hard-working spirit in the R&D department. As explained earlier, NPD projects are usually divided into various tasks, which are then assigned to different team members to carry out simultaneously, to save time. If one part of the design goes wrong, the whole project is affected (interview record: #0104, #0106, #0110). Therefore, everyone works hard to get their parts done, since no one wants to be branded the troublemaker who drags the whole team down. Besides working hard to get their own tasks done, they are also willing to sacrifice individual gains to help colleagues or to work overtime for the sake of cross-functional coordination. For example, one team member mentioned:

'Working overtime or bringing work home is unavoidable. ... There are some uncontrollable factors. For example, if the sales department wants to track a product because they have promised clients to deliver on certain dates. ... The sales department thus has to track whether we have the prototypes ready. ... So, it is hard to say because so many different things involved in this, or maybe it's because we have to attend a tradeshow and have to get the new products ready for the show' (interview record: #0107).

Giving these reasons, it is clear the reasons why their R&D personnel work so hard are complicated.

5.4.3 Training and Creativity

For their R&D personnel, knowledge, experience, skills and creativity

are vital for their work because they are indispensable for carrying out design tasks. How knowledge, technical know-how, and creativity are transferred, exchanged, utilised and stored can be crucial for the team's effectiveness. This section will look into training and creativity in the NPD teams.

5.4.3.1 More comprehensive on-the-job training

The new director has also introduced more comprehensive training programmes, such as weekly seminar sessions, an in-house library, a summer training camp, and regular job rotation, in addition to the traditional leader-mentor mentoring training practice. Unlike the former director, who relied heavily on setting examples and mentoring to train subordinates, the new director takes training more seriously and systematically because he believes that people are the most important asset of the firm (interview records: #0101, #0106). The main objective of these training practices is to record and diffuse knowledge and expertise as much as possible, both on paper and among R&D personnel (interview records: #0104, #0105).

First, by systematically recording the progress of NPD projects and other technical operations, they have built up a dataset/archive which can provide important references for future NPD projects. As explained earlier, R&D personnel rely heavily on their experience in developing existing products to guide NPD projects. For example, they may go back to look at the records of past NPD projects for clues to solve technical difficulties or problems. Besides building archives and recording the progress of NPD projects, managers also encourage R&D personnel to record their own progress in a notebook, which can be very handy for design tasks (interview

records: #0103, #0106, #0110).

Second, in addition to recording explicit knowledge on paper or on file, they also encourage team members to accumulate experience and learn skills from each other through interpersonal interactions, imitation, observation and problem-solving scenarios (interview records: #0101, #0104, #0105, #0106). For instance, senior R&D managers rotate NPD personnel regularly or assign junior workers to different projects to give them the opportunities to deal with different aspects of NPD operations. The idea is that if they assign young talent to deal with diverse tasks, they can encourage them to learn different skills from different subject experts with whom they work, which helps them to build up a portfolio of diverse expertise over the course of time (interview records: #0101, #0104).

The comprehensive training regime seems to be highly beneficial, and it is said to help them to make better use of team members' knowledge and expertise, and to retain and motivate young R&D personnel (interview records: #0101, #0104, #0105, #0106). For example, they do not have to worry too much about losing valuable know-how because they have trained several subject experts in specific areas (Interview record: # 0104).

5.4.3.2 Creativity: opportunities and constraints

Generally speaking, their R&D personnel are given plenty of autonomy, opportunities and support to enable them to be creative, experiment and learn from trial and error (interview records: #0101, #0104, #0105, #0106). For example two managers pointed out:

'My job now is to make sure that every young R&D worker has the opportunities to learn from trial and error. Of course, we managers would watch their progress and provide support such as tell them

what went wrong or share our experiences. We will support them to make them feel less frustrated' (interview record: #0101).

'Our young engineers come to our firm to learn, so we would give them opportunities and spaces to learn, and we cannot ask them to get things right at their first attempt. We would give them space to grow and to trial and error. Sometimes we don't even tell them that they are doing it in the wrong way, but we will look at their results and explain why their approach did not work' (interview record: #0104).

Although managers are keen to give their subordinates the room or the 'stage' to experiment and learn, there are certain limitations which may constrain how creative their team members can be or allowed to be. First, the concern for efficiency is a reason why novelty is not always welcome or feasible. Under the company's constant pursuit of efficiency, R&D personnel also have to be as efficient as possible, so they prioritise efficiency over novelty (interview records: #0106, #0109, #0110). R&D personnel are often put off trying radical ideas that may be too risky and complicated, or they require a long time or a high cost to manufacture as they are under constant pressure to deliver new products efficiently, swiftly and cost-effectively (interview record: #0101, #0103, #0106, #0110). For example, one manager explained that they do not allow subordinates to trial and error too many times, given the pressure to be efficient:

'Nowadays our bosses do not allow us to fail too many times given the pressure to be efficient. We now deal with a lot of cases so we have to be more efficient and therefore cannot afford too many mistakes' (interview record: #0110).

Second, concern for safety and legal regulation is another restriction

when it comes to product design. As a reliable and trustworthy manufacture, company K has to abide regulation and take responsibilities for their products. Therefore, their R&D managers have to take trade standards such as international standardisation organisation's (ISO) regulation⁹ or legal regulation into consideration when developing new products. For example, one manager stated:

'The first thing we think about when designing tires is the legal regulation. This is because tyre is a type of commercial product which has legal responsibility attached. Therefore, we have to consider legal limitations in different countries, such as America's DLT regulation and Japan's JIS regulation. Tyre is a global product because every country imports and exports tires' (interview record: #0109).

Even though these legal or trade regulation may provide guidelines for the NPD teams on product design or product safety, they can also impose restrictions on the designs as safety overrides novelty (interview record: #0103, #0104, #0105, #0108). One manager explained:

'Basically tires are very traditional. Therefore, be honest with you, too radical, too novel, or new designs which are developed completely from scratch are probably no good because tires must be safe. So, you see, you can't let your ideas run wild when designing tires since safety is the utmost priority for tires' (interview record: #0103).

Third, cost control or the pressure to cut cost is another restriction faced by the NPD teams. As the price of rubber and other raw materials continues to soar, R&D managers have to be very savvy about how much they spend on product innovation in order to cut cost and boost profitability (interview

records: #0101, #0105, #0106). As a result, they prefer less risky and more cost-effective incremental innovation to more expensive and riskier radical innovation. For instance, one manager pointed out that the reason why they only develop very few radical products is because they have 'high potential, but they also come with potentially higher costs, and thus they can only try when 'their company's scale is large enough to support such costly projects' (interview record: #0101).

Finally, in addition to a limited funding, insufficient manpower can also constrain R&D personnel's creativity. As mentioned earlier, the R&D department has been understaffed on a long-term basis, so R&D personnel have to cope with a hefty workload. However, work overload is shown to stifle creativity because individual team members simply do not have the 'luxury' to apply their creativity or imagination to every project, as they are already struggling to get things done (interview record: #0110).

Based on these reasons, it is clear that the R&D personnel have to cope with various restrictions and learn to be creative within limitations. However, it may not always be possible to be creative because practicability, safety, cost-effectiveness and efficiency are regarded as more important than creativity.

5.5 Teamwork Outcome

Company K's R&D teamwork effort not only leads to collective outcomes but the experience of working in teams also has influential effects on individual members. In terms of collective outcome, the R&D department develops around three hundred new products per year (interview records: #0102, #0110). However, most of these new products are upgrades to

existing products because radical new designs are very rare (interview record: #0101, #0102, #0103). There are several reasons behind why they only have very few radical new products, including concern over cost-effectiveness, shortage of manpower, inadequate technological competence and managers' risk aversion tendencies. For instance, one manager explained:

'Although we are an R&D department, but, personally, I think our department should be called a development department since we only do development and there is no research. We young R&D personnel want to develop radical products which are completely different from what's available in the market. But we, including our bosses, all know that we do not have the time to do it. We are simply struggling to cope with existing cases and do not have the luxury to think about radical new products' (interview record: #0110).

Even though they produce very little radical products annually, both radical new products and incremental upgrades of existing products are beneficial for the firm's overall performance (e.g. improving profitability and market share) because product innovation is the engine of Company K's growth (interview record: #0101, #0106). Judging from its financial performance and steady two-digit growth over the past decade (http://emops.twse.com.tw/emops_all.htm, company information, access date: 10 Dec 2008, access location: Birmingham, UK), it seems that the R&D personnel's hard work has paid off (interview record: #0106). Besides profitability and sales growth, Company K has managed to improve their ranking on Common Wealth Magazine's 1000 top leading firms in Taiwan year after year (Common Wealth Magazine Editors, 2000, 2004, 2005,

2006). Like the famous Fortune 500, this ranking takes profitability, market share, growth and a range of other key organisational factors into consideration. Besides the firm's overall performance, they also manages to develop several patents every year, which are then registered across Asian, American and European countries and contribute considerably to Company K's competitiveness (interview record: #0101, #0106).

In addition to collective team performance, teamworking can also have significant influences on individual R&D workers. Generally speaking, most of the interviewees seemed content with their experience of working in Company K's R&D department. Some even said that they love what they do (interview record: #0103, #0106, #0105). For instance, one of them stated:

'I love my job, I love developing tyres. Like many of my colleagues, I can't help staring at tyres all the time when I go out. It's become a professional hazard' (interview record: #0103).

Moreover, beside self-reported contentment, overall turnover in the department is gradually decreasing from over 20% in the 1980s, 1990s to around 5 % in early 2000s (interview record: #0102, #0104). This is an objective indication that most of their workers have increasingly positive feelings towards working in their NPD teams and thus are more willing to stay with their firm (interview record: #0104). On another front, although working in Company K's R&D department may seem to be a positive experience for most team members, some do feel stressed and exhausted due to the hefty workload, shortage of manpower, and tight deadlines (interview record: #0103, #0106, #0110). Work overload and the pressure

to deliver good results efficiently may have negative effects on creativity and psychological well-being (e.g. stress, burnout, exhaustion) in the long run. For example, one interviewee stated that he felt so tired so that he could not 'think straight' and be creative as he could as coping with unrealistic deadlines and an ever-increasing workload alone had drained all his energy (interview record: #0110).

5.6 Chapter Summary

This case study set out to explore teamwork for product innovation in Company K's R&D department. The findings reveal that company K's R&D executives have switched their management practices from the traditional paternalistic management approach to a more systematic, project management style of management. During the reign of the former director, who adopts a traditional, paternalistic style of leadership, the R&D department was having problems with high staff turnover, inefficiencies, lack of clearly defined goals and targets, and low employee morale. In order to tackle these problems, the family owners brought in external professional managers, who then introduced new management approaches including project management practices, clearly defined goals and plans, standardised operational procedures and a comprehensive training programme. These new practices seemed to help them to keep track of NPD projects, make better use of their NPD talent, and motivate and retain young R&D personnel.

Although they have modernised the way they manage NPD projects and R&D personnel, the R&D department still has a conservative, hierarchical work climate and great emphasis is still placed on efficiency and cost control.

These company traditions can have undesirable effects on how team members work and innovate. For example, the top-down hierarchical work climate can discourage junior team members sharing ideas because they feel that they have to show respect towards colleagues and superiors. Moreover, under company K's cost-cutting policy, R&D personnel are constantly put under pressure to deliver new products cost-effectively, swiftly and efficiently. As a result of these pressures, their NPD teams prefer incremental innovations over radical innovation because incremental upgrades are more practical, less risky and cheaper to develop. The cost-cutting policy has also contributed to the shortage of manpower in the R&D department where employees are expected to work hard to cope with hefty workloads and tight deadlines. As a result, several R&D personnel stated that they felt stressed, exhausted and sometimes unable to do their best (interview records: #0103, #0107, #0110). R&D managers may wish to address these issues for the sake of their personnel's performance and well-being in the long-run because overworking on a long-term basis will undermine efficiency as well as employees' physical and psychological wellbeing.

Chapter 6 Case Study Two: Teamwork for Product Innovation in Company G

6.0 Introduction

This case study looks into teamwork for product innovation in a longstanding family firm, Company G. The first two parts of the chapter provide some background information about the family firm and the structure of its R&D department. The following third part explains how their product innovation processes unfold. After that, the fourth part explores key issues related to teamwork for product innovation, including (1) how their two NPD teams are managed, (2) patterns of interpersonal interactions, and (3) training and creativity. Finally, this chapter concludes with a brief chapter summary.

6.1 Key Organisational Context

Founded by the Ku Family in the early 1980s, Company G is a longstanding family firm, which is still controlled by the founding family. Although it has been listed on the over-the-counter (OTC) exchange security market (i.e. the Gre-Tai Securities Market, GTSM¹⁰) since 1996, the founding family still has considerable ownership control. Like many indigenous family firms, Company G's owners also manage their firms in a highly centralised, hierarchical manner. In order to concentrate control, their family members occupy most strategic positions, including chairman, general manager, chief financial officer, marketing manager, etc. Such a family member only top-management team is typical among small and medium sized family

firms in Taiwan (Yen, 1994a, 1994b).

Started up as a small vending machine manufacturer, Company G has expanded its business operation considerably and now has several factories which manufacture more sophisticated electronic products like plasma TVs and LCD monitors. Like many other manufacturers in the region, it has adjusted its core operation from a manufacturing-focused OEM strategy to more innovation-driven ODM and OBM strategies. For example, Company G now offers clients tailor-designed products which are sold under their brands (i.e. ODM products), while it also has developed and manufactured products which are sold under its own label (i.e. OBM products).

Moreover, Company G has several R&D departments located in different factories and focusing on different products. This case study will only look into how the vending machine R&D department develops new products. The main reasons for choosing this particular department are that (1) vending machines are the firm's most representative products and (2) it has been rather successful in Taiwan's domestic vending machine market as one of the market leaders (interview record: #0201). In contrast, Company G's other products, such as LCD monitor and plasma TVs, only have a very small, insignificant market share.

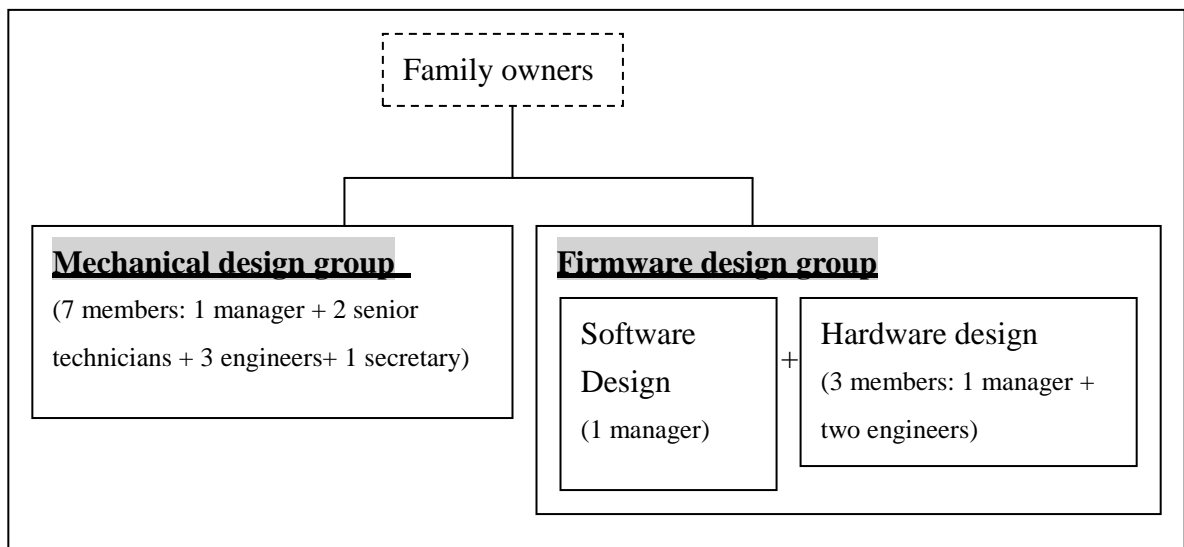
6.2 Structural Traits of Company G's Vending Machine NPD

team

Company G's vending machines are developed in its headquarters (HQ) by their vending machine R&D department. At the time of my access, the vending machine R&D department was going through some major

restructuring. The department was divided into two smaller teams: the mechanical design group and the firmware design group¹¹. The firmware group was divided further into two smaller units: the software design unit and the hardware design unit. As illustrated in Figure 6.1, the whole department can be considered a NPD team consisting of two smaller groups. The R&D department is under the lead of the owners, who play roles of team leaders and decision makers, even though they do not carry out any design tasks or legwork. This section will focus on three structural traits of the vending machine R&D department: (1) the high turnover and the age gap phenomenon, (2) the unstable team structure and (3) the lack of a clearly defined team leader.

Figure 6.1: The structure of Company G's vending machine R&D department



6.2.1 High Turnover Rate and the 'Age Gap' Phenomenon.

High staff turnover is typical among Taiwanese family firms (Yen, 1994a, 1994b), and Company G is no exception. Its R&D department suffered high staff turnover at around 50% in the 1990s. In 2002, the turnover rate

peaked at 80% as the whole R&D department was dissolved because only two departments stayed while all of the others quit (interview records: #0201, #0202). Even though the owners have subsequently recruited many people to rebuild the department, the high turnover among young R&D workers does not seem to have improved because the work conditions remain more or less the same (interview records: #0201, #0202, #0205). Low salary, lack of promotion, constant policy U-turns, and the owners' in-group favouritism and authoritarian management style are all considered the reasons behind the high staff turnover (interview records: #0201, #0202, #0204, #0205, #0206). For example, two team members pointed out that as long as the owners were still in charge the firm, they would have problems of retaining talent in the department:

'We have been having this problem of high turnover for a very long time. In the past two decades, the family owners seem unable to improve this situation at all. Yet, they don't seem to realise that this is a problem caused by their leadership and management style. There is nothing we can do about it. We can learn to tolerate and adapt. ... Sometimes it is really unbearable, but you just have to get on with it. ... Nevertheless, our new recruits usually cannot stand such a style; hence, they often leave the firm within one or two years' (interview record: #0201).

'The problems in our teams will never be solved or changed as long as we are having the same bosses. So, when the new employees come into our department, they are very unlikely to stay long in such an environment' (interview record: #0206).

High staff turnover has led to the loss of technical expertise, as well a 10-20 year age gap between the senior baby-boomer workers and their younger X, Y generation colleagues. The considerable age gap has also

caused some communication problems (interview records: #0201, #0202).

6.2.2 Unstable Structure of the R&D Department.

Another problem caused by the high staff turnover is the unstable department structure. The vending machine R&D department has been through several major restructurings from 2000 to 2005 because the company was unable to retain R&D personnel. The owners were forced to hire more R&D talent and restructure the department several times (interview records: #0201, #0202). However, rebuilding and restructuring processes have led to office politics and power struggles among department members. The instable team structure and the tension and the lack of cohesiveness accompanied with the turbulence were said to have undermined the collective efficiency of the department and the morale of R&D personnel (interview records: #0202, #0203, #0204, #0205).

6.2.3 Absence of a Clearly-defined Leader.

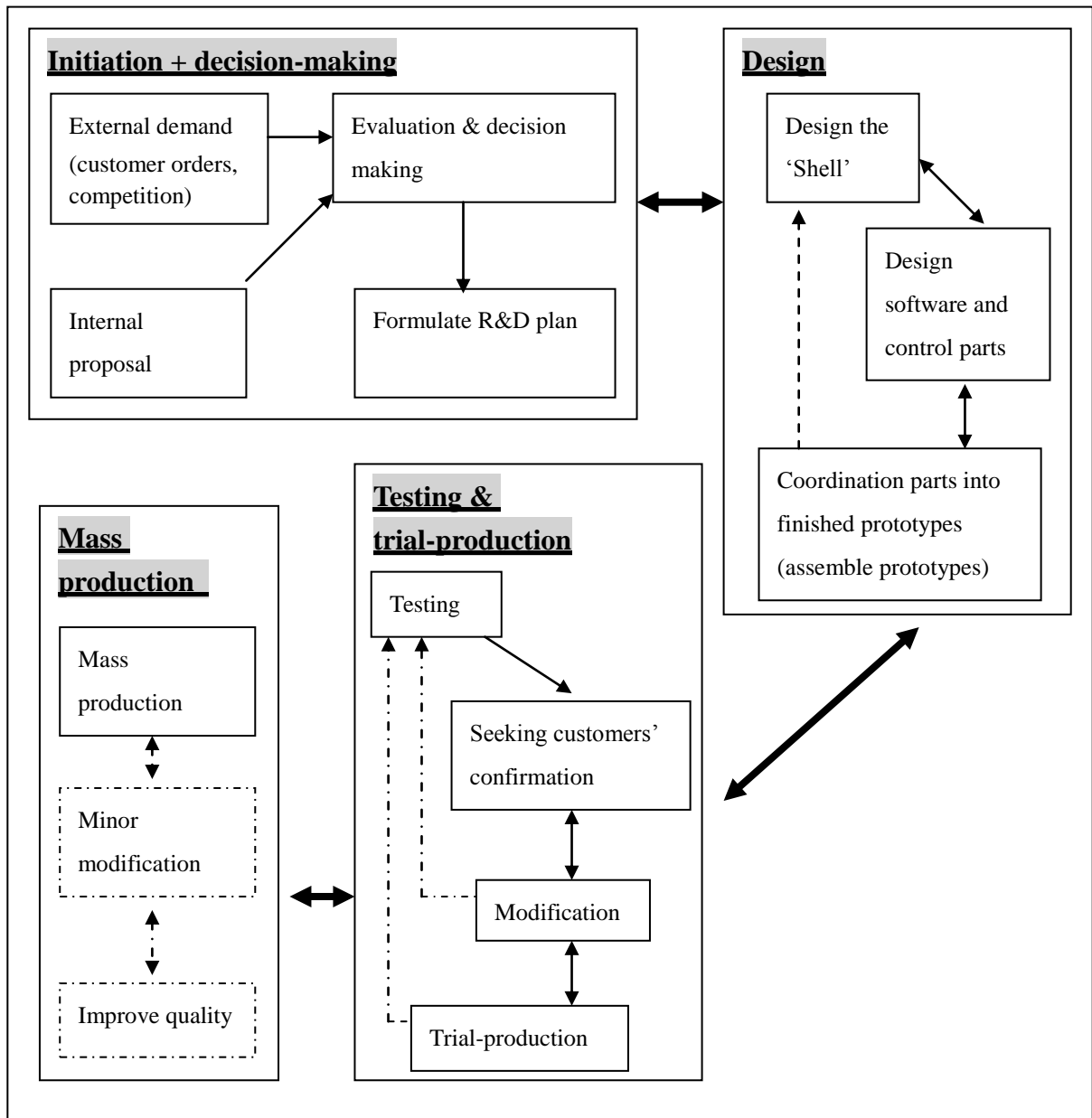
Even though the owners are projected as the team leaders in Figure 6.1, they do not assume the official role as the leaders of the R&D department. The owners do act as the decision-makers who dictate R&D decisions, and as supervisors who keep a close eye on the progress of NPD project. Yet, they do not carry out any legwork (e.g. design), or run the day-to-day management of R&D operation. (More details regarding the owners' involvement in NPD projects are provided in section 6.4.1.1). As the owners are reluctant to relax their grip on power, none of the three R&D managers has been given the team leader position, so they have to consult the owners regarding important R&D decisions. As a result, their R&D

department does not have a clearly defined team leader and that the absence of a team leader is shown to have negative consequences, such as causing inefficiencies, confusion, low morale and power struggles (interview records: #0201, #0204, #0205, #0206, #0209).

6.3 Product Innovation Processes

Although different types of NPD projects may unfold differently due to different circumstances, similar patterns can be found in how the R&D department carries out NPD projects. Generally speaking, the development of vending machines can be divided into four key stages: (1) the initiation and decision-making stage, (2) the design stage, (3) the testing and trial-production stage, and (4) the final mass production stage. As illustrated in Figure 6.2, these stages are likely to have complex and iterative relationships because the team has to make changes to sort out unforeseen contingencies and problems which they encounter throughout the development of new products.

Figure 6.2: The development processes of new vending machines in Company G



Note: ---line implies possibility, not necessity.

6.3.1 Initiation and Decision-making Stage.

The initiation and decision making stage is dominated by the owners, since only they have the power to decide what new products they want to

develop. The owners would assess external demands and internal proposals to decide whether to initiate NPD projects. External demands can be customers' orders or market competition (e.g. new products available in the market), whereas internal proposals can be ideas from R&D managers or the owners. Most of their NPD projects was driven by client orders, as they only have one internal proposal for NPD project which was initiated by the owners in 2000 (interview records: #0201, #0202).

Although the owners are keen to dictate decisions, they do not carry out the actual development. Therefore, after they have set the objectives, budgets and timeline for NPD projects, they then pass the projects to the R&D managers to draw up plans and carry on with the development work.

6.3.2 Design Stage.

After the owners have set targets and the R&D managers have come up with an overall plan for the NPD projects, the next step is to develop designs and prototypes. This stage is generally divided into three steps. Step one is to develop the 'shell' of the vending machines that this part is carried out by the mechanical design group. After the shell is completed, the project is passed on to the firmware design group to develop software and control parts (e.g. computer programme and IC components that control the vending machines). Finally, the two groups then work together to assemble all the parts together to complete the prototypes. Although this process may seem like a simple, straight forward process, the two groups may find themselves going backwards and forwards between different steps in order to sort out problems which they encounter while developing or assembling their parts. For example, if the two groups are unable to assemble the parts

together, they may have to go back to the drawing board to redesign.

6.3.3 Testing & Trial-production Stage.

After the prototypes are up and running, the next step is to run standardised tests to check their performance and safety. As manufacturers, the company has to run sets of tests to ensure that its products are safe to use and in order to fulfil legal and industrial obligations (interview record: #0204). The R&D managers often invite clients to participate in the testing of prototypes for two reasons. First, it may help to improve customer satisfaction because clients can ask the NPD teams to change the designs, functions or the performance of the prototypes based on their preferences. Second, client feedback can help Company G's NPD team to reduce the risks or costs of new products (interview record: #0204). For instance, they can avoid wasting more resources on developing further designs that their clients dislike by seeking confirmation before producing the new products.

Besides running tests to check the quality and performance of the prototypes, the NPD team also has to run trial productions to see whether the new designs can be manufactured in the factories. If the production departments are unable to produce the new design by using existing production facilities, the NPD team has to make alterations, or even start over again in the worst case scenario.

6.3.4 Mass Production Stage.

The final stage of product innovation is to hand the new products over to the production department to begin mass production. Although before starting mass production the team has to run a trial production, the

production department may still find problems when producing the products on a large scale, such as technical glitches or poor quality. If the production department is unable to solve these problems, they would ask the NPD team to step in to fix the problems. Once again, if the NPD team cannot resolve these issues with minor alterations, they may even have to start over again. Therefore, in this late stage of product development, the NPD team may have to repeat modification and subsequent assessment processes several times until a satisfactory result can be achieved.

Overall, these development stages are likely to have complex and iterative relationships, especially given the problems and unforeseen contingencies encountered throughout product innovation.

6.4 Teamwork for Product Innovation: What Matters?

For those who work Company G's NPD teams, teamwork for product innovation is a very complex issue. This section will review three key teamwork-related issues vital for their NPD team: (1) how the NPD team is managed, (2) interpersonal interaction, and (3) the role of training and creativity.

6.4.1 Team Management

6.4.1.1 The role of the family owners

Like many small and medium family firms in Taiwan, Company G's family owners have very centralised control of their firm. Although they do not carry out any design work or manage NPD team members themselves, they do play leadership roles in the management of NPD projects as the

supervisors, arbiters, and decision-makers.

First, they play an important role of supervisors, who constantly monitor the progress of the team and assert control accordingly. For example, most of the NPD projects are customer orders, which have strict terms and conditions. Therefore, the owners would monitor R&D managers' and junior members' progress on a daily basis, such as checking if they are on the right track, and if they can deliver the products on time. However, most of the team members are frustrated about the owners' constant interference and authoritarian demands for changes, as the interventions disrupt their plans and work schedules (interview records: #0201, #0202, #0204, #0209). For example, one manager pointed out:

'The owners usually do not give us clearly defined instructions about designs or targets and they normally wait until we come up with the designs to give us directions. Our engineers consider how products will be displayed in the vending machine and how to make the best of the space in the machine to come up with the most feasible design. But once the owners see the designs, they demand all sorts of alterations based on their personal preferences. We have no choice but to make the changes, even though this disrupts our plans. And the owners just keep changing their minds all the time: today they like this, tomorrow they prefer something else. ... It's really frustrating for us' (interview record: #0201).

Second, in addition to supervisory roles, the owners also play a role of arbiters to sort out disputes between the two R&D groups. As none of the three R&D managers is given the role of team leader, they have to leave it to the owners to step in and arbitrate disagreements (interview records: #0201, #0203, #0204).

Third, in order to reinforce control, the owners also play important roles in NPD projects as the decision-makers, who dictate most strategic decisions based on their personal preferences. However, their intuitive style of decision-making is considered highly inappropriate and dysfunctional by most of the team members for the following reasons: (1) violation of ISO guidelines, (2) inconsistent policies and decisions, and (3) power struggles between family members. Four out of the ten interviewees pointed out that this intuitive decision-making approach is a clear violation of ISO guidelines (interview record: #0201, #0202, #0208, and #0210). As Company G has an ISO certificate, it should manage product innovation and follow a set of work procedures recommended by ISO. For instance, according to ISO guidelines, key R&D decisions should be derived from thorough and multi-angle evaluations in cross-functional meetings, in which cross-functional heads (e.g. department heads from production, marketing and R&D departments) meet up to discuss the development of new products. However, such cross-functional meetings are often not held because the owners are reluctant to relax their grip on power by allowing non-family managers to participate in the making of strategic decisions, despite this being against ISO guidelines (interview record: #0201, #0202, #0208, and #0210). For example, one manager explained:

'In theory, under the regulations of ISO9000, we must follow a set of procedures when developing new products because every company, which is certificated by ISO, has to follow this rule. But, in our company, the family owners are the ones who break these regulations. ... For example, we are supposed to have a project proposal meeting to evaluate market conditions and other key information, while the heads of various departments have to attend this meeting under the regulations of ISO. But, the main problem is

that these meetings and evaluation procedures are not adhered to at all. We and other department heads are simply not given the chance to contribute to the processes of planning or setting targets' (interview record: #0201).

In addition to the breach of ISO regulations, many interviewees also pointed out that the owners often give inconsistent, conflicting or unclear instructions. There is a consensus among the team members that the owners lack the right sort of technical competence and project management skills, and therefore they are often unable to make sensible decisions and give clearly defined, coherent R&D instructions (interview records: #0201, #0202, #0204, #0205, #0206, #0209). As a result, owners often have to alter their decisions and instructions in order to address problems caused by their ambiguous or flawed decisions. Such frequent policy U-turns and abstruse instructions are considered confusing, demoralising and ineffective because the R&D personnel have to waste considerable time, effort and resources on trying to figure out what the owners want them to do (interview records #0201, #0202, #0204, #0205, #0206, #0208). For example, two junior members stated:

'The owners tend to give us ambiguous instructions because they do not have clear ideas about the objectives of the products. If they do not know what they want, we don't know either. Their ambiguous instructions and policy U-turns are very irritating' (interview record: #0205).

'The owners always give us ambiguous instructions. They tell you to use this approach today. But they may deny that they told you this approach when you show them the results tomorrow. Such policy U-turns can be quite annoying' (interview record: 0207).

Moreover, in addition to problems with inconsistent policies, many interviewees complained that power struggles between the owners is another reason why they think the owners' involvement is dysfunctional. For example, the CEO and the general manager often give the team contradictory instructions because the brothers often disagree with each other (interview record: #0201, #0202, #0204). Such contradictory instructions from top executives can be rather distressing for team members, who fear that they will be penalised for choosing a side (interview records: #0201, #0202, #0204). For instance, two team members explained:

'The owners often give us conflicting orders. For example, one owner may say: let us do this case; but another one may say: no, we do not want to take this case. We are really confused. They should sort things out between themselves before telling us what to do' (interview record: #0204).

'Individual differences are human nature so that we all have to adjust to cope with different opinions and standpoints. But the owners are not just different; they often see things in completely opposite ways. One prefers a long-term perspective, and another one prefers a short-term approach. They just can't reach consensus and are constantly in fight with each other. This is really frustrating, but there is nothing we can do about it' (interview record: #0201).

Judging from these roles, it is clear that the owners do act as the ultimate team leaders, even though they do not actually do any development work. However, their involvement seems to be rather dysfunctional, given their inability to provide the team with sensible and coherent guidance.

6.4.1.2 A hierarchical, top-down teamwork pattern

The NPD team as a whole is managed in a rather hierarchical, top-down fashion. At the top of the hierarchy, the owners as authoritarian leaders dictate most key R&D decisions, such as what new products they are going to develop, targets for new products, budget and resources given to the team, and the timelines of NPD projects. The owners' authoritarian leadership approach (e.g. emphasis on their hierarchical superiority, tendency to give subordinates ambiguous instructions, constant policy U-turns, intuitive decision-making style, and reluctance to listen to subordinates' opinions and dissent) is deeply loathed by the staff (interview records: #0201, #0202, #0204, #0205, #0206, #0207, #0209).

In the middle of the hierarchy, the three R&D managers are given considerable autonomy, which allows them to make plans and manage their subordinates, even though they are not allowed to make any key R&D decisions. Although each manager has his own leadership style, similarities can be found regarding how they manage their subordinates. For example, they all dislike the owners' authoritarian approach and prefer a more competence, performance-oriented approach (interview records: #0201, #0203, #0204). For example, they assign each NPD team member with specific types of tasks to match their expertise, and then provide specific support based on individual performance (e.g. explain the rationale behind why they need to change a design or why an alternative approach might work better) (interview records: #0201, #0203, #0204). They also give subordinates plenty of opportunities to participate in the design process and encourage them to share ideas. One manager explained:

'I dislike the owners' authoritarian approach, so I do not do the same to my subordinates. I usually give them a lot of 'space' to try their ideas. Unless it's urgent, I will allow them to try their approach' (interview record: #0201).

Although the managers have the final say, at least they do allow their subordinates to contribute ideas in the making of plans and designs by giving them autonomy and encouraging them to share ideas in meetings. Opportunities to participate in the making of NPD plans and the autonomy given to the team members, are vital for the team as a whole because they allow the team to make better use of available knowledge and expertise (interview record: #0201).

Finally, at the bottom of the hierarchy, junior team members generally play the role of obedient subordinates, who just comply with whatever the owners or the managers tell them to do (interview records: #0206, #0207, #0209, #0210). Even though they are dissatisfied with the authoritarian management approach, most of them would still try to fulfil their responsibilities and get their tasks done on time for the sake of their individual performance appraisal and the collective efficiency of the team (interview records: #0202, #0205, #0206, #0210).

6.4.1.3 Lack of a competent, clearly-defined team leader

As mentioned earlier, the owners do play some team leader roles (e.g. dictatorial decision-makers and arbiters), even though they do not actually take responsibility for managing NPD projects and R&D personnel. Meanwhile, the three non-family R&D managers are given equal status to share the responsibility of running NPD projects, even though they are not allowed to make key R&D decisions. As a result, the R&D department lacks a

competent, clearly defined team leader or project manager (interview record: #0201, #0202, #0204, #0205, #0206, #0207, #0209, #0210). For example, one team member stated:

'Our owners do not have the technical expertise and project management skills to manage NPD teams, but they are reluctant to listen to us when it comes to making decisions. For example, when initiating a NPD project, they should host a cross-functional meeting to discuss R&D personnel's ideas but they just make decisions based on their personal preference and order us to carry out their decisions. When we give them suggestions, they do not listen. Even if they do listen, they may change their minds the next day. ...So, what we need now, is a competent, experienced project manager to lead our team. Our owners should not be the ones leading our NPD team' (interview record: #0205).

The lack of a clearly defined, competent team leader can have several implications for NPD teams. First, without a competent leader to set sensible and coherent goals and instructions to guide the team, their NPD team members often struggle to figure out what the owners are trying to achieve. They also have to waste a lot of time, effort and resources on making changes to satisfy the owners' every-changing minds or to deal with conflicting orders from different family executives (interview records: #0201, #0202, #0204, #0205, #0206, #0209, #0210). One team member stated:

'We need a project manager, but it will never happen. ... The owners need to set clearly defined goals and specifications because we need clear guidance to develop designs. Yet, the owners just keep changing their minds, as it is easy for them to give orders but it is very difficult for us to carry out the changes because mechanical parts are all interconnected. If you change one part, you have to change all relevant settings. For example, one machine probably has ten large units and if you change the setting of one unit, it will

take one or two months to run through all the changes. If they keep changing their minds, we don't know how many months this thing will drag on. ... To make the matter worse, different members of the owner's family have different approaches towards developing products, and this is one of the factors why this project has taken so long' (interview record: #0202).

Second, the lack of a clearly defined team leader also means that there are inevitable power struggles and office politics between the three R&D managers. As all three enjoy equal status, they are often in dispute over coordination issues and who is in charge (interview records: #0201, #0203, #0204). Two of the three managers stated:

'The main disadvantage of separating the R&D operation into an IC control part and a mechanical part is that we have problems with the coordination, like how to coordinate. We and they (the other sub-group) are parallel units and everyone does their own bits. If you want to tell them what to do, they would say that why should I listen to you, since we have equal status? So, you see, we have conflicts over this (coordination issue). If we are unable to sort it out, we will have to ask the owners to step in to arbitrate. ... I am not the head of the R&D department, so I cannot tell the other subgroup what to do. If they are my subordinate, they will have to comply with my orders. But they are not; we are two parallel groups and this does make a difference. They sometimes listen to me, and sometimes they don't. This is a problem when managing the R&D operation. ... I am put in a difficult situation here. The owners do not want to give me the power and the role as the head of the department, but they always come to me when there are problems' (interview record: #0201).

'We do have some disputes with the other sub-group over coordination and designs. But we normally would try to sort it out in meetings. We listen to each other and try to cooperate with them. But office politics and power struggles between the two groups are inevitable' (interview record: #0204).

Finally, the lack of a competent project manager can also affect junior R&D personnel by causing confusion over coordination responsibilities or supervision issues. For example, one member of the mechanic group argued that they were not getting enough supervision from their group manager because his manager was too eager to play the role of chief coordinator and therefore spent a lot of time on interfering how the other NPD group is managed (interview record: #0210). He stated:

'Our group manager cares too much and interferes too much on how the other R&D group is managed. He is the head of our group and I suppose that his first priority is to take care of us. But it is often not the case and he often leaves us on our own and goes on to deal with the other group's work. I don't think this is right because it has taken too much of his time. He should spend his time and energy on our group's own work and on taking care of us and that this should help to improve our efficiency. If he keeps on doing other people's work, our cases will not get done and our workloads will increase' (interview record: #0210).

Furthermore, the lack of a clearly defined team leader can cause confusions over coordination. A member of the firmware group pointed out that they need a chief coordinator to sort out interdepartmental coordination tasks, but given the absence of a clearly defined team leader, his superiors often ask him to act as the chief coordinator to arrange interdepartmental collaboration. Under the firm's hierarchical work climate, he feels weird about being a low-rank employee who is forced to assume certain leadership responsibilities (interview record: 0206). He stated:

'In terms of coordination between departments, if I am the department head then I should be the one sorting out coordination

with other managers. You know, manager versus managers. But my manager often asks me to sort out coordination with other managers and I feel wired. It should be the managers doing it, not me. Because people in other department may be puzzled about this, they may think: why the subordinate is coordinating and delegating the tasks, not the manager? At the end of the day, managers in other departments just come straight to me to sort things out' (interview record: #0206).

Clearly, the lack of a competent, clearly defined team leader in the R&D department can cause inefficiencies, confusion, power struggles and office politics.

6.4.1.4 Cross-functional coordination

Given the interdependent nature of product innovation, their R&D personnel have to work with many parties throughout the development of new products, such as subgroup members, the other R&D subgroup, production departments, clients, suppliers, etc. In a way, the coordination activities can be divided into two types: internal coordination and external coordination. In terms of internal coordination within the R&D department, as explained, the absence of a clearly defined team leader has led to office politics and coordination problems. In addition to internal coordination, R&D personnel also have to work with various external parties outside of team boundaries, including other departments in the firm, clients and suppliers. In terms of working with other departments, NPD teams have to work with the sales and production departments. The coordination with these departments is often plagued with conflicts of interest as each department is self-interested in pursuing its own performance targets (interview record: #0204, #0207, #0210). For instance, they may compete for scarce

resources (e.g. production facilities), or disagree on timeline of the NPD projects. For junior team members, negotiating with other departments (e.g. negotiate access to production facilities for running tests) can be frustrating as they lack bargaining power due to their low status. They would try to make polite requests before asking superiors to step in for the sake of maintaining harmonious work relationships and long-term collaboration with production or sales personnel. Asking superiors to interfere is often considered as the last resort as it may spoil the work relationship because they would be, in effect, forcing the other party to compromise by doing so. For instance, one manager explained:

'Everyone has their own responsibility and this can be problematic. For example, those who work in the factories would prioritise their production quota because they have to deliver products on time. But we R&D personnel want to prioritise product innovation. So when we need our productions to work with us, I try to ask my team members to do the prototypes ourselves and not to bother the production people. But if the product is too big or too complicated that we cannot deal with it ourselves, I have to ask the production people to help us out. They moan about it and complain that they are busy. But this cannot be helped because it is the owners' orders. After all, it is not my company and everyone has their own share of responsibility, so we all have to work together to get things done' (interview record: #0204).

Besides working with internal departments, R&D personnel also have to work with clients, suppliers and other strategic alliances (e.g. research institutes and trade association). In terms of working with clients, customer orders are the main driving forces behind NPD projects in Company G, so that client demands are taken seriously as the most important reference for product designs (interview records: #0201, #0203, #0204). Moreover,

besides working with clients, Company G also has to work with suppliers to secure the steady supply of components or raw materials (interview records: #0204, #0210). In addition, the NPD team, especially senior executives, would also work with research institutes, government bureaus, and trade associations, such as participating in research projects and workshops (interview records: #0210). Working with these external parties may help the team members to acquire trade information, which in turn, may inspire creative ideas (interview records: #0201, #0204, #0209, #0210). However, collaboration with external parties is not without its problems. For example, R&D personnel have to prioritise client complaints or demands and respond quickly for the sake of customer satisfaction but it can be tiresome and stressful to deal with such external demands as they may disrupt the work schedule and increase workloads (interview record: #0201, #0203).

Moreover, all of these coordination tasks are divided in R&D meetings and assigned to various team members to carry out. Given the high interdependency of NPD projects, most team members would try their best to sort out the coordination tasks assigned to them (interview records: #0202, #0203, #0204, #0205, #0209, #0210). However, without a clearly defined chief coordinator to track the overall progress, manage team boundaries, and support team members, the efficiency of coordination often suffers. Table 6.1 summarises a list of coordination issues faced by the R&D team.

Table 6.1: Coordination issues in Company G's NPD team

Who they coordinate with	Issues or problems
Follow group members within their subgroup	<ul style="list-style-type: none"> • Relatively easy and less problematic because the group members share the same goals and have closer ties, given that they spend a lot of time working alongside each other.
The other R&D subgroup within the same department	<ul style="list-style-type: none"> • The lack of a clearly defined team leader has led to power struggles, office politics, confusion and inefficiencies between R&D personnel. If they are unable to reach consensus, they have to ask the owners to step in to arbitrate, if the managers are unable to effect a solution.
Colleagues in other departments (e.g. marketing, production)	<ul style="list-style-type: none"> • Conflicts of interest and competition for production resources are often to blame for coordination problems within these departments. Junior team members would try to make polite requests before asking superiors to step in for the sake of maintaining harmonious work relationships and long-term collaboration.
Clients	<ul style="list-style-type: none"> • Team members have to try to satisfy clients' demands or complaints for the sake of customer satisfaction.
Suppliers	<ul style="list-style-type: none"> • Team members have to make sure the steady supply of components to control costs and development time. Suppliers may also provide them with valuable industrial information.

6.4.1.5 Pursuit of efficiency

Like many other family-owned manufacturers in the region, Company G also relies on its ability to be efficient to survive (interview record: #0205). Under the firm's emphasis on efficiency, the NPD team also has to deliver new products speedily and cost-effectively. This pressure to be efficient can have two implications for how they work and innovate. First, under the firm's cost-cutting strategy, the NPD team is given a small budget and limited resources to carry out product innovation, so that they have to be very savvy about how they spend the R&D budget (interview record: #0203, #0204,

#0206). The owners' reluctance to invest in R&D is shown to cast constraint on product design and thus restrict the potential of the new products (interview record: #0206, #0207). In order to make the best use of a tight R&D budget, the team mostly develop incremental innovation such as upgrades of existing products or imitations of competitors' products and they seem able to deliver this type of product efficiently and successfully. Risky ideas or designs which may require major investment in acquiring technology and upgrading equipment are usually ruled out as impractical and inappropriate (interview records: #0204, #0205). As a result, they only have one radical product development project, which they struggled more than five years to complete it (interview records: #0201, #0202, #0203, #0204, #0209). It was said that they might be able to speed up the progress of this radical project quite a bit, if the team had more manpower (e.g. technical experts) and adequate resources (e.g. a generous R&D budget and state of art machineries) at their disposal.

Second, besides trying to spend as little as possible on developing new products, the team also has to deliver products speedily (interview records: #0201, #0202, #0204, #0210). Taiwan's domestic vending machine market is a highly competitive market in which firms must be able to deliver new products quickly in order to survive, compete and attract orders (interview record: #0201). This time pressure may also deter team members from trying radical ideas, which may take a long time to develop or manufacture (interview record: #0205).

Although the team members try to meet these conditions as much as possible, it may not always be possible to achieve all these efficiency targets. For example, if they want to speed up a particular development project, it

may cost more and disrupt existing production arrangements (interview record: #0207). When facing such a dilemma, the team members must consult the owners regarding the difficult situation, since only the owners can make key R&D decisions.

Overall, judging from these team management issues reviewed in this section, it is clear that the owners are perhaps the pivotal figures behind the management of NPD projects even though they do not carry out design or other R&D legwork.

6.4.2 Interpersonal Interaction in the Team

Besides team management, how individual team members interact with each other is also an important part of teamworking. For those who work in Company G's NPD team, they not only have to carry out design tasks but they also have to deal with all relevant parties involved in NPD projects. This section will look into five patterns of interpersonal interactions observed in the NPD teams: (1) a hierarchical work climate, (2) top-down communication, (3) concern for interpersonal harmony and an objective attitude towards conflicts, (4) high conformity pressure and latent dissent, and (5) a shared sense of responsibility and a hard-working spirit.

6.4.2.1 A hierarchical work climate

Under the family owners' authoritarian leadership style, the NPD teams also work in a highly hierarchal manner. As a result, interpersonal interactions in the team are strictly formal. For instance, they all address each other by their formal job titles instead of more intimate first names. Besides using formal job titles as identities, everyone is acutely aware of

each other's hierarchical status and would behave accordingly. For example, the owners use their status as a means of control, in that they expect their subordinates to show total compliance as a gesture of loyalty and respect (interview records: #0201, #0202, #0205, #0207, #0209, #0210). However, most junior team members dislike the presence of this large power distance and prefer a more open and egalitarian approach (interview records: #0205, #0206, #0207, #0210). For example, one team member said:

'I personally think that it's ok that the owners still emphasise social hierarchy in the firm and use it to manage people, but they should not overdo it. I think they have overemphasised these hierarchical differences in our firm. Today, Taiwanese society as a whole has evolved from the old feudal system into a more modern, open and equal society. I wonder why they can't just follow this societal trend. Why do they still insist on hanging on to these old-fashioned concepts? ... I think we should not pay too much attention to the hierarchical differences or the differences in status, but fine, I conform since I work for them' (interview record: #0205).

His opinion is echoed by many others, who are also dissatisfied towards the owners' 'old-fashioned' management approach because they feel that they are being discriminated against and undermined by the owners (interview records: #0201, #0202, #0206, #0207, #0209, #0210). Even though they are not happy about this highly hierarchical climate, they still have to conform and show proper respect towards the owners in order to survive, fit in and protect themselves (interview records: #0201, #0202, #0206, #0207, #0209).

6.4.2.2 Top-down communication

Given that this NPD team is managed in a highly centralised manner, the

flow of communication is largely top-down (i.e. owners and managers tell their subordinates what to do). For junior team members, most of the time they passively receive orders (interview records: #0202, #0205, #0206, #0207, #0210), mostly work on their own and only talk to others when they have problems or when they have to arrange coordination tasks. When they encounter problems, they often prefer to seek help from peers, rather than to go to superiors straightaway, because they feel more comfortable talking to peers (interview records: #0205, #0206, #0209). Under their firm's hierarchical climate, these junior personnel are very cautious about what they say towards superiors and they dare not take any form of initiative because they do not want to overstep their superiors' authority (interview records: #0202, #0205, #0206, #0207, #0210). For example, three team members stated:

'Under our company's hierarchical culture, we don't get to decide what new products that we are going develop. ... The owners are the only ones who can decide. ... If they want us to do things, then we do it. We are passively taking their orders anyway' (interview record: #0202).

'In the climate like in our firm, fine, I will just play the role as an obedient subordinate, and I am not going to argue with owners and managers publicly. Fine, I just do what they tell me to do. Maybe it is the norm to distinguish the hierarchical roles between superiors and subordinates in this conservative countryside. In northern cities or in the high-tech industries, they don't put such emphasis on hierarchical ranking. They don't address each other by formal job titles like we do' (interview record: #0205).

'I have lots of ideas but I don't dare to talk to superiors about my ideas. I usually discuss them with my fellow engineer and just talk about it between us' (interview record: #0206).

Besides their hierarchical work climate, another reason why junior team members are often put off sharing thoughts or seeking help from superiors is that the R&D managers and owners are often really busy and therefore may not always have the time to discuss problems in great detail (interview records: #0201, #0202, #0209). In order to solve problems or issues swiftly, the managers may just tell their subordinates what to do instead of engaging in robust two-way discussions (interview record: #0201, #0203). However, this may deter their subordinates from seeking help over small troubles or things which they do not understand and that they would rather seek advice from peers first rather than going straight to the bosses (interview records: #0203, #0209). For example, one junior team member mentioned:

'I have been working here for more than a year and I think my superior is really busy. Therefore, I don't think he's got the time to share experience or to discuss with us. I prefer to ask colleagues first and I would only ask my manager if he is the only one who knows the task which I am dealing with' (interview record: #0209).

Clearly, the hierarchal work climate and managers' busy schedules can put team members off sharing ideas or seeking feedback. Even though Company G has a proposal-appraisal panel, which is designed as a bottom-up communication channel to encourage low-ranking employees to share thoughts via written reports, this panel cannot fully compensate for the negative effects of the hierarchical work climate.

6.4.2.3 Concern for interpersonal harmony and an objective attitude towards conflicts

As mentioned previously, the unstable department structure and the absence of a clearly defined leader, combined with the owners' authoritarian management approach, have led to tension, power struggles and office politics in the R&D department. Although the team lacks cohesiveness, most members would still try to manage faked/superficially harmonious work relationships with colleagues, as such fake interpersonal harmony can be vital for surviving in the workplace and for long-term collaboration (interview records: #0201, #0203, #0207, #0209, #0210). For instance, one team member stated:

'Our group is rather small, in that there are only four of us. However, our group is not cohesive at all because we dislike each other and hold grudges against each other. It's probably because of the manager's leadership style or the personality clashes accumulated over a long period of time. ... Nevertheless, on the surface, it all seems calm and harmonious. Yet, who knows what's going on beneath the surface. ... At least everyone tries to be polite superficially. I try to suppress my negative emotions until I cannot take it anymore. If I decide to quit, I will let my frustration erupt' (interview record: #0206).

His opinions were echoed by several team members, who also said that they would conceal their negative emotion, tolerate mistreatment and behave diplomatically in order to manage faked harmonious work relationships with relevant others at work (interview records: #0202, #0203, #0204, #0205).

Moreover, the pursuit of seemingly harmonious work relationship can

also affect how they deal with conflict. For the sake of 'preserving' harmony at work, most team members would try to avoid open confrontation, take an objective attitude to dealing with task-related conflict, and be considerate of other's standpoints (interview records: #0202, #0204, #0205, #0206, #0207, #0210). For example, two team members stated:

'We know everyone has their own standpoints, so we are considerate. If we argue, it is purely business, nothing personal. We would not hold grudge against each other' (interview record: #0202).

'We have to collaborate with other departments like the production department, and it is troublesome to work with them, really troublesome. ... If production personnel give us a hard time, we still have to pretend that we are cool and smile because we do not wish to displease them. I will keep on pleading for their help, but if they are playing tough, then I will have to ask my manager to step in. But I prefer to sort things out by myself. If I ask my manager to step in, they will have no choice but to do me a favour, despite that they are unwilling to cooperate. Forcing them to help will not do any good for our work relationships or for our future collaboration with them. ... If everyone can try to manage a harmonious work relationship with each other, then we can all work together smoothly' (interview record: #0210).

Clearly, behaving in a polite manner and tolerating mistreatment when dealing with task-related conflicts are often considered as the right thing to do to avoid open confrontation – as it can spoil work relationships and thus place future collaboration in jeopardy.

6.4.2.4 Pressure to conform and latent dissent

Company G's highly hierarchical work climate and the constant pursuit of efficiency can impose considerable conformity pressure on the R&D

personnel. First, under the influence of their hierarchical work climate, most of them would just obey superiors' instructions and not voice concerns or dissents because the owners dislike dissents (interview records: #0201, #0202, #0205, #0207, #0209, #0210). For instance, three team members pointed out:

'I have been working here for so many years that I know it is useless to share my dissent with the owners. So, I frankly give up. Often I would say nothing and just do what they tell me to do' (interview record: # 0202).

'I am very cautious about what I say towards the owners. ... If they are not satisfied about what I said to them, they will scold me for displeasing them and give me a hard time afterwards' (interview record: # 0207).

'Those who have been working here for a very long time know the owners' personality very well. They do not like dissent, and the more you say, the more trouble you will get yourself into. In the past, we have tried to reason with them or to explain situations and problems, but the owners just didn't want to listen and they scolded us for dissenting. Now, I don't say anything to them. I will just do what they tell us to do. ... I have learned my lesson not to dissent with the owners because no matter what, they blame us. Even though following the owners' flawed decisions will take longer, increase costs and undermine efficiency, it is inevitable because they just won't listen. It cannot be helped' (interview record: # 0210).

Clearly, the owners' authoritarian personality and reluctance to accept dissent have put the team members off sharing ideas. Even though they are aware of the owners' flawed decisions, they often choose to conform as they do not want to antagonise the bosses by dissenting, and thus put their job security and career prospects in jeopardy (interview records: # 0201,

#0202, #0204, #0205, #0206, #0207, #0210). By conforming, the team members not only get to protect themselves, but they may also find latent opportunities to propose their dissent and to convince the owners. For instance, if team members can find evidence to prove that the owners' approach does not work or works poorly, they can then propose their own ideas as alternatives, which are more likely to be accepted given that the owners' approach has already failed (interview records: #0202, #0203, #0204 #0208, #0209). This 'conform first and dissent later approach' can be rather frustrating and inefficient, but several team members argued that this approach is the only feasible solution in this case (interview records: #0202, #0205, #0209, #0210). For instance, one team member explained:

'Owners normally do not listen to us. If they want us to use their approach, we have no choice but to comply. Maybe I will try their approach and my approach at the same time. If their approach does not work, then I will show them my approach. I have to show them the evidence that their approach failed and my idea was successful. They will only listen to us if we can prove that they are wrong' (interview record: #0203)'.

Second, besides the effects of the hierarchical climate, the firm's constant pursuit of efficiency can impose conformity pressure on team members. As mentioned earlier, the team members are constantly under pressure to deliver products efficiently and swiftly. For them, getting things done swiftly and efficiently is often the utmost priority rather than achieving the best results/designs (interview record: #0203, #0204, #0205, #0206).

Even though the owners' authoritarian management style and emphasis on efficiency can impose conformity pressure on the team members, there are other factors such as expertise, interpersonal liking and the sense of

responsibility which may help to offset the negative effects of conformity pressure and encourage the team members to share dissents and ideas (interview records: #0202, #0203, #0205).

6.4.2.5 A shared sense of responsibility and a hard-working spirit

Although 70% of the team members are dissatisfied with their working conditions, they would still work hard to fulfil their responsibilities and try their best to get things done (interview records: #0202, #0204, #0205, #0207, #0208, #0209, #0210). There are several possible reasons behind this shared sense of responsibility, including societal value of diligence, professionalism, Company G's MBO policies, concern for job security, and the interdependent nature of teamworking (interview records: #0202, #0203, #0204, #0205, #0206, #0207, #0210). For example, two team members pointed out:

'I am the most senior person in this team, so that I feel that I have the responsibility to share my thoughts, no matter whether it is my task or not. ... At my age, I have nothing to lose, so I am totally devoted to my work. ... At the end of the day, I am just doing what I have to do as a return for my salary. It's a sense of responsibility, I think. I will not just do what I think it's fair for the amount of money which they pay me. Instead, I give them all I have. It doesn't matter how much they pay me, I am going to get things done and do as much as I can' (interview record: #0202).

'I think that getting my tasks done is the right thing to do. It's not about getting rewards or something like that; it is simply our obligation to get our work done and to do it well' (interview record: #0210).

6.4.3 Training and Creativity

Besides team management and interpersonal interaction, another aspect of teamworking such as training and creativity can also be crucial for their R&D personnel. The team members' knowledge, expertise and creativity are perhaps the most important assets to the team. However, it seemed that their team as a whole was having trouble making the best of these assets because of the lack of training and constraints on creativity.

6.4.3.1 Lack of adequate on-the-job training

Even though most interviewees think that learning and training is an important part of R&D work (interview records: #0201, #0202, #0204, #0205, #0206, #0207, #0208, #0209, #0210), they do not have adequate on-the-job at work. For instance, junior personnel or newcomers only receive a one-off induction and some leader-subordinate mentoring on problem-solving. The R&D managers can only give their team members autonomy and assign them with suitable tasks to encourage them to learn by doing (interview records: #0201, #0203, #0204). One of them explained:

'Our young R&D personnel come to this department to learn. Of course, we have to give them a stage to learn. If we don't give them a stage, how can they learn?' (interview record: #0201).

The lack of rigorous training means that junior team members have to rely on self-learning to get on with their jobs, such as searching online for information and actively seeking advice from senior colleagues (interview records: #0203, #0204, #0205, #0206, #0207). Although they do have archives of past NPD projects and some written guidelines, which may

provide some reference points for developing designs, the lack of training and guidance can be frustrating for inexperienced junior members (interview records: #0205, #0206, #0207, #0209). Several team members argued that they have a strong need for comprehensive on-the-job training, which would be highly beneficial for inspiring creativity, improving the quality of their designs and making better use of knowledge and expertise (interview record: #0205, #0206, #0209, #0210). For instance, one team member stated:

'We need education and training. Personally, I think education and training is very important for innovating. If we don't go out to attend trade shows to see new things, we will not have the external stimulus to inspire new designs or creative ideas. So, we should invest in education and training. ... We really need such external stimulus because it can save us a lot of time on developing new products or they help us to catch up with new trends' (interview record: #0209).

In addition to on-the-job training, company G's R&D personnel also have very limited opportunities to learn different skills from fellow team members, as they are encouraged to stick with one core area of expertise. For example, everyone in the team is assigned to do similar or repetitive tasks in a given area, so they will become subject experts in their area over the course of time (interview records: #0205, #0206, #0207). However, encouraging one core area of expertise also means that without job rotation or training activities, team members have very few opportunities to learn different skills and deal with different types of tasks, which can be demoralising for young R&D personnel (interview records: #0205, #0206, #0207). For example, two junior team members pointed out:

'I do similar tasks day in day out, maybe because I am not competent enough so that my superiors do not want to give me too much pressure. The first six months when I started working here, I felt that I was learning a lot because I was learning different things all the time. But after that, I did not have the opportunities to do different tasks, so I feel stuck because there is nothing new to learn' (interview record: #0206).

'I have been doing similar tasks for more than a year and I did not have the opportunities to do different types of tasks such as mechanical control or plastic coating. Our company does not use job rotation and everyone is assigned to deal with similar tasks in a specific area' (interview record: #0207).

Besides demoralising young R&D personnel, encouraging R&D personnel to stick to one job also means that they can easily lose valuable know-how and competence, especially given Company G's inability to retain talent on a long-term basis. This is because when people leave, they take their knowledge and expertise with them. As the team only allow one expert in one given areas while there is no comprehensive training to diffuse or store knowledge and skills among selected employees, the team is left with no backups when the one and only expert leave. In a way, the lack of training and job rotation may make the vicious cycle of high staff turnover in their NPD team even worse.

6.4.3.2 Creativity: opportunities and constraints

The three R&D managers all acknowledge that they have to give their subordinates plenty of autonomy, resources and opportunities to allow them to apply their creativity to their work (e.g. on designs). For example, one manager indicated:

'I ask my subordinates to contribute their ideas regarding new designs. Then I make judgements on the feasibility of their ideas to make a decision. If possible, I allow them to carry out the tasks using their ideas. I have to let them try, because it is important to encourage them to be creative on the designs. If I always ask them to follow my orders, it will kill off their creativity. But we may not always be able to allow them to do so' (interview record: #0201).

Although R&D personnel are given considerable autonomy to encourage them to apply their creativity to designs, they may not always be as creative as they want to be for several reasons: (1) cost-cutting policy, (2) the pursuit of efficiency, and (3) the lack of support.

First, R&D personnel only have a small R&D budget and very limited resources at their disposal for product innovation, as it is said that the owners are reluctant to invest in R&D (interview records: #0203, #0206, #0207). In order to control costs, the R&D managers cannot afford to let creativity roam free in their teams as they have to be very shrewd about how much they spend on developing new products (interview records: #0201, #0203, #0204). Consequently, team members are encouraged to stick to practical ideas and feasible designs, so that radical new ideas, which may require major investment or radical new designs, are often ruled out as impractical, inappropriate or not cost-efficient (interview records: #0204, #0205, #0207). For example, one manager explained:

'Our company does not have the resources to allow our employees to go crazy on creativity. This is more likely to happen in the high-tech industry. We cannot afford that here. For example, it would be crazy to design a triangle vending machine which would be very difficult to utilise the space in such a shape. This is a creative idea but it would be difficult to materialise such a creative

idea into actual products. Perhaps it is possible on other types of electronic products' (interview record: # 0204).

Second, Company G's pursuit of efficiency and its MBO policy means that R&D personnel are afforded slim margins of error. As a result, R&D personnel often prefer practical options (e.g. incremental improvements) instead of radical designs in order to deliver designs swiftly and efficiently to fulfil their responsibilities. For instance, one team member pointed out:

'It's normal to get the blame if I am unable to deliver good results, such as unable to complete a new design or something like that. I may lose my job if I fail to deliver good results; but I think it's perfectly sensible. Nowadays, our company is moving towards performance-oriented management, so it is not like in the old days when you got life-employment and did not have to worry about failures because you would only get a slap on the wrist. So, under such a performance-oriented policy, I feel unsafe or insecure when I am unable to deliver new products for which I am responsible. I have to take the responsibilities' (interview record: #0205).

Finally, in addition to the constraints of cost control and MBO policies, the NPD team also lacks the right sort of psychological climate to support innovation and creativity. The owners' authoritarian management style and the firm's hierarchical work climate, combined with the tension and power struggles between R&D personnel, often make R&D personnel feel 'unsafe' or 'uncomfortable' trying novel ideas or 'unconventional' ways of doing things (interview records: #0201, #0202, #0204, #0205, #0206, #0207, #0209, #0210). For example, one team member said:

'I think you need a pleasant mood and recognition towards the company in order to be creative and do other routine tasks. If you don't even get along with your colleagues, how can you be creative?

If you are in a weird, oppressive interpersonal environment like ours, would you still have the mood to be creative? I don't think creativity is a one-man job; it cannot be achieved by one person alone. ... Our company is a bit like a spoon-feed/rote-learning education system, which gives you a question and a specific answer and you are not allowed to answer the question in other ways' (interview record: #0205).

Combining all these factors, it seemed that Company G's R&D personnel do face considerable constraints on how creative they can be. If the team members are not allowed to be creative and are encouraged to conform with more 'effective conventional ways of doing things' instead, the team as a whole may not be able to make the best use of its members' creativity and expertise, which may restrict the potential of their new products.

6.5 Teamwork Outcome

The team members' teamwork effort can lead to two types of outcome: collective outcome and individual level outcome. In terms of the collective outcome, the NPD team as a whole is able to deliver several dozens of new products successfully each year (interview record: #0201). However, the great majority of these products are copycat innovations or incremental upgrades of existing products. They only managed to develop one radical NPD project in between 1985-2005 (interview records: #0202). Although they are able to deliver most of incremental innovation projects swiftly and efficiently, they struggled badly to complete their one and only radical new product project, which took more than five years to complete (interview records: #0201, #0202). The owners' constant interference, policy U-turns, lack of clearly defined decisions, power struggles between family executives

and their reluctance to invest in R&D are considered the main reasons behind the team's struggle with this radical product (interview records: #0201, #0202, #0203, #0206). For example, one team member explained:

'We only have one radical new product, which is 100% our own effort in the past two decades. It is completely new because we did not copy other people's products. ... Maybe it is because its system is very complicated, it has taken more than five years and it is still not done. Another reason is probably because most people quit within these five years. Yet, the most important reason is probably because the owners did not have clearly defined goals and plans about this product. They don't know what they want so they change their minds all the time. Today they want this, but tomorrow they may want to add something else. No wonder it has taken more than five years, but it cannot be helped. It's just like an endless nightmare because we don't know when we can have closure' (interview record: #0202).

Although the R&D personnel strived hard to deliver new products efficiently, their teamwork effort did not seem to improve their firm's poor performance. Company G has been a long-term loss-making company, as it has rarely made any substantial profit in the past decade¹² (http://mops.twse.com.tw/mops/web/t56sb01n_1, company information, access date 10 Dec 2009, internet location: Birmingham, UK).

Besides collective output, the experience of working in teams can also have significant implications for the individual team members such as affecting their job satisfaction, turnover intention, and individual growth. In terms of job satisfaction and turnover intention, working in Company G's NPD team does not seem to be a pleasant experience for most of the team members, as there is a common feeling of dissatisfaction and authoritarian

control (interview records: #0201, #0202, #0204, #0205, #0206, #0207, #0209). For example, two out of the ten team members said that they would like to leave the firm but were unable to do so due to financial concerns (interview records: #0202, #0206). Although they were unhappy about these aspects of their work environment, they would still work hard and fulfil their responsibilities, mainly for the sake of individual performance appraisal and job security.

In addition to job satisfaction, the experience of working in NPD teams can also affect individual team members' learning and technical expertise. In a way, doing NPD tasks can be stimulating as team members are learning new things (e.g. technical know-how) and improving their competences and that their experience may also be rewarding as they may like the sense of achievement when they complete their tasks (e.g. finalise design or solve problems) (interview records: #0202, #0203 #0206, #0208). Yet, junior team members generally feel more frustrated about the lack of training and learning opportunities in their firm than their well-established senior colleagues as junior workers are more eager to learn due to their lack of experience (interview records: #0205, #0206, #0209).

6.6 Chapter Summary

This case study sought to explore teamwork for product innovation in Company G's R&D department. The findings reveal that without the right sort of technical competence and project management skills, the family owners' desire to control the R&D operation actually undermines the effectiveness of NPD projects and the morale of the R&D personnel. First, in order to reinforce control, the owners dictate most key R&D decisions based

on their personal preferences. Yet, without the right sort of technical competence, they are often unable to provide clearly defined, coherent instructions. Their constant policy U-turns and ambiguous instructions have led to inefficiencies and delays. Second, the owners' authoritarian leadership behaviours, including their reluctance to listen to subordinates, undermining subordinates' contributions and an emphasis on hierarchical differences, are the main reasons why most of the R&D personnel feel demoralised. Third, the owners' reluctance to appoint a clearly defined, competent team leader to lead the two R&D subgroups has caused power struggles, confusion and tensions among R&D personnel. Without a competent team leader to guide the team, the team has struggled badly to complete a radical NPD project.

Besides the owners' authoritarian leadership approach, other aspects of their teamwork environment, including inadequate on-the-job training, the pressure to deliver new products swiftly and cost-effectively, high conformity pressure and the power struggles between the three R&D managers can also constrain how the NPD team work and innovate. Although most team members would work hard to fulfil their responsibilities and role obligations, they may not always be able to make the best of their ideas, given the contextual constraints. These constraints are shown to be the reasons why the team mostly deliver incremental and copycat innovation instead radical new products.

Chapter 7 Case Study Three: Teamwork for Product Innovation in Company F

7.0 Introduction

This case study explores how Company F's NPD team uses teamwork to carry out product innovation. The first two parts of the chapter provides key information about the longstanding family firm and the structure of its NPD team. The third part explains how product innovation is carried out in Company F. The fourth part explores key issues about teamworking for product innovation, including (1) how the NPD team is managed, (2) patterns of interpersonal interaction, and (3) training and creativity. Finally, this chapter concludes with a brief chapter summary.

7.1 Key Organisational Context

Founded in 1962, Company F is a longstanding family firm, which is privately owned and controlled by the founder and second generation family members. The founder himself as the chairman is still in charge of the day-to-day management of the family firm, even though he is in his early 80s. Besides the founder, several second generation family members as senior executives, including sales executives, production managers, and operational executives, also play important roles in the management of the family firm. In addition to family executives, they also have one non-family executive.

Although Company F has expanded its operation internationally by setting up two subsidiaries in China, it can still be categorised as a

medium-sized family firm. The main reason is that its headquarters, which is Company K's core operation centre, only employs around 350 employees, while the scale of its subsidiaries in China is also relatively small, as they employ around 200 people in total.

Like most manufacturers in the region, Company F also adopts a mixture of OEM, ODM and OBM strategies and is gradually switching its focus from a manufacturing-only OEM strategy to more innovation-driven ODM and OBM strategies. Nonetheless, OEM and ODM products are still important lifelines for the firm, as these products account for around 80% of its revenue (interview record: #0305). Currently, it produces a wide range of plumbing-related electronic products and mechanical components such as boilers, balance valves, etc. for the export and domestic markets. Given that Taiwan's domestic market is very small, Company F focuses mainly on export markets. Before going into the details of product innovation, the next section will explain briefly the structure of the NPD team.

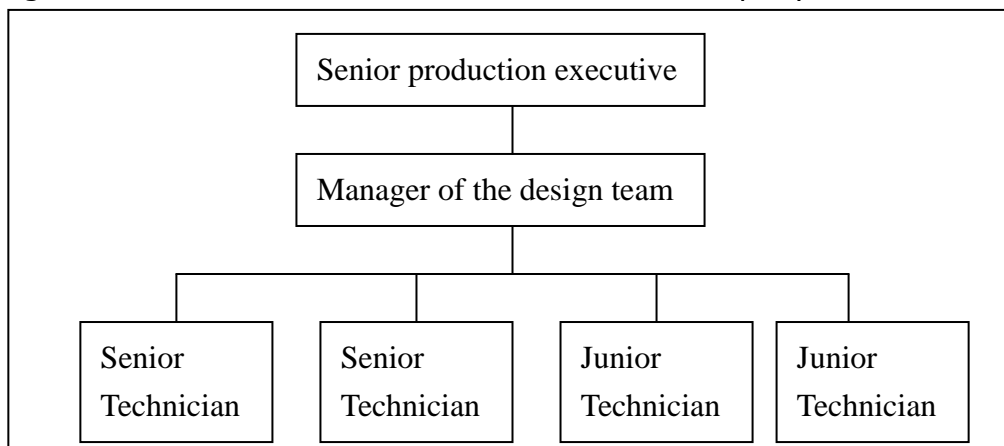
7.2 Structural Traits of Company F's NPD team

Company F does not have an R&D department. Instead, it has a 'technical department', which is responsible for product innovation and other technical operations. This technical department consists of two smaller teams: the NPD team and the model design team. The NPD team is responsible for developing new products, whereas the model design team is responsible for arranging and developing models needed for producing new and existing products. This case study will only focus on how NPD team members work as a team to develop new products.

As illustrated in Figure 7.1, this NPD team had six members at the end

of 2006. This structure is largely stable, since the two managers and two senior technicians have been working alongside each other for more than 15 years. However, they do have problems retaining young R&D personnel on a long-term basis, as the annual turnover rate in the R&D department is around 25-30% on average over the past decade (interview record: #0302, #0305). The two junior technicians have only worked in the team for less than four years and one of them has expressed a desire to leave (interview record: #0302). Given the large difference in the team members' tenure, there is a 10-15 years age gap between the older R&D personnel and the younger X, Y generation R&D workers. As in Company K and Company G's teams, this large age gap has led to communication problems (interview record: #0302, #0305).

Figure 7.1: The structure of the NPD team in Company F

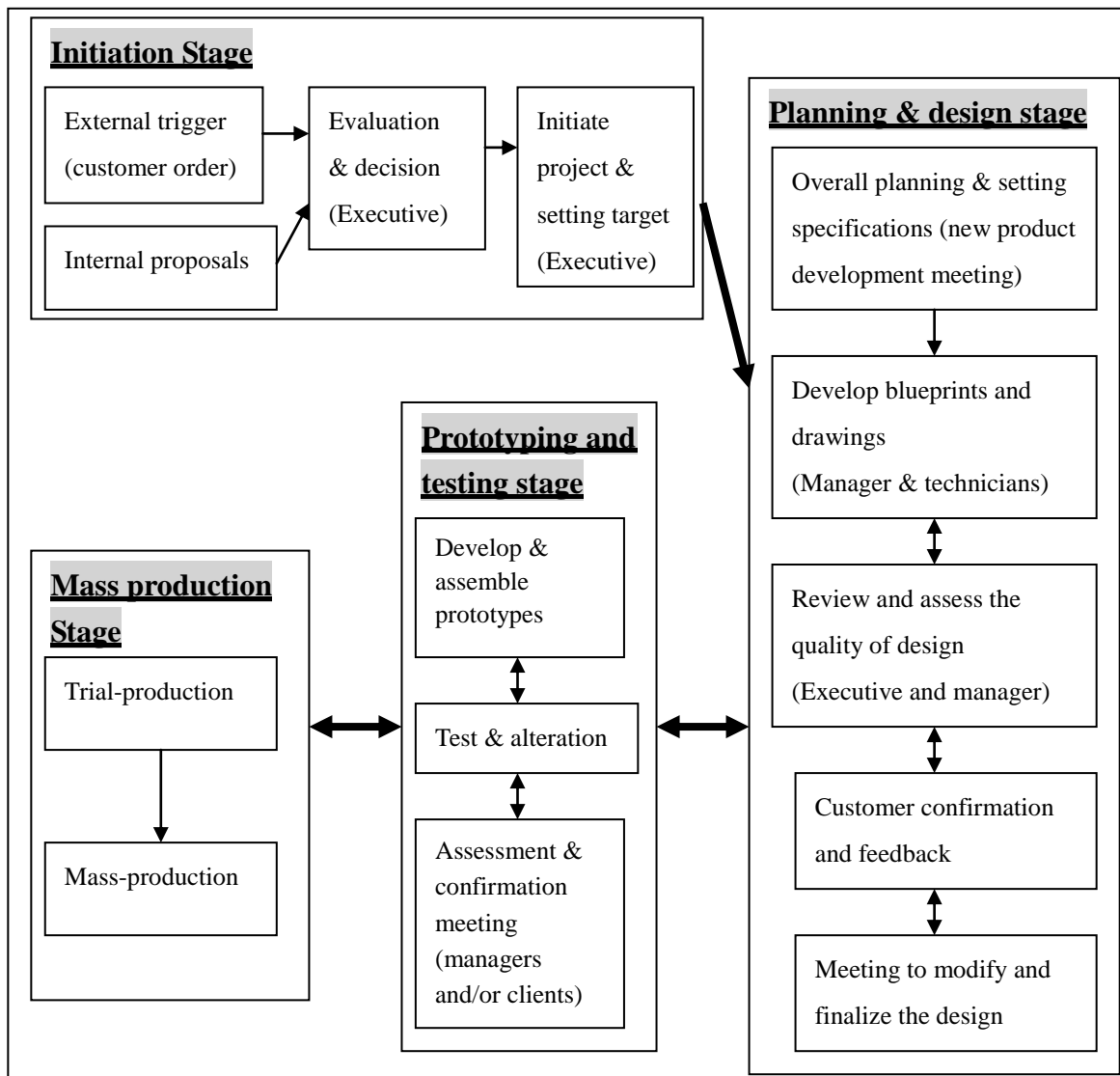


7.3 Product innovation Processes

Although Company F's NPD team develops many different types of new products, they do follow similar procedures. Generally speaking, product innovation processes can be divided into four key stages: (1) the initiation stage, (2) the planning and design stage, (3) the prototyping and testing stage and finally (4) the mass production stage. As illustrated in Figure 7.2,

the relationships between these stages are likely to be complex and iterative rather than simple and straightforward. This is because the NPD team is bound to encounter all sorts of problems and unforeseen contingencies throughout the development of new products, and therefore it has to make alterations and changes in order to solve these problems (interview record: #0302). For example, if team members find problems when developing and testing prototypes, they may have to go back to the blueprints and make changes in order to fix the problems.

Figure 7.2: The product innovation processes in Company F



7.3.1 Initiation Stage

As the owners do not participate in the development of new products, they have empowered and entrusted the senior production executive, who is an experienced professional manager, to take care of R&D operations. The production executive is the only one who can make key R&D decisions (e.g. what new product to develop and the targets of the NPD projects), with the exception of large investment projects, on which he must consult the owners (interview records: #0305). He would assesses clients' demands, market conditions, their production capacity and other factors (e.g. costs of raw material) when deciding whether or not to initiate a NPD project and to set targets of the new products (e.g. budgets and timeline). Comparatively speaking, clients' orders, especially orders from foreign customers, are the most important driving forces behind Company F's NPD projects, while internal proposals for product innovation are relatively rare.

7.3.2 The Planning and Design Stage

After the team boss (i.e. the production executive) has decided to begin a project and has set overall targets, the next step is to draw up detailed plans and to start the actual development. In terms of making plans, the two managers of the NPD team host a cross-functional meeting and invite all relevant parties (e.g. heads from the production department, quality control personnel and junior R&D personnel) to discuss key issues (e.g. design, budget, technical and production arrangement). Based on these discussions, the manager of the NPD team then draws up a plan and a schedule, which are then sent to all participating parties to ensure that everyone involved

knows what to do and when to deliver their tasks (interview record: #0305). These cross-functional meetings and the multi-perspective approach towards development of NPD plans are adopted in compliance of ISO regulation on product innovation.

Subsequent to setting up project plans, the next step is to start the design process. In this design stage, the manager of the NPD team is perhaps the most pivotal figure because he is the one who organises, plans and coordinates the NPD project. He is responsible for drawing up overall framework for the design, which is then divided into various parts for junior team members to carry out simultaneously. Once everyone has done their part, the manager assesses the individual parts and then assembles the components into one complete product. However, this process may not always be straightforward because the manager may not be satisfied with his subordinates' work and might ask them to redo the designs. Once the team manager is satisfied with the design, he will then send the designs to the team boss (i.e. senior production executive) for further assessment. However, like the team manager, the team boss also has high standards, so he often rejects the designs as not good enough and demands alterations. Finally, after the team boss has given his seal of approval to the product designs, they are sent to the clients to seek confirmation and feedback. However, if the clients are not satisfied with the designs, the team must carry out alterations or even re-design the product until the clients are completely happy with the new products. Therefore, as illustrated in Figure 7.2, this design phase is usually a complex and iterative process in which the team is constantly assessing and refining new product designs until a satisfactory result can be achieved.

7.3.3 The Prototyping and Testing Stage

After the team boss (i.e. the production executive) and the clients have both approved the designs, the next step is to develop prototypes and run tests on these prototypes. Like Company K and Company G, Company F also has several quality recognition certificates (e.g. ISO certificates), so it has to test its products to ensure that they are reliable and safe to use. After the prototypes have passed sets of tests, they are then sent to the clients for final confirmation before moving on to the production phase. Such final confirmation may help the NPD team to reduce operational risks because they can make necessary changes based on client feedback rather than go straight to producing items that the clients may not be happy with.

Although these processes may seem straightforward, they may encounter all sorts of problems such as technical glitches when assembling the products. If the R&D personnel are unable to resolve these issues through minor alterations, they will have to redesign the product and repeat the whole process all over again.

7.3.4 The Mass Production Stage

Once the prototypes have passed sets of safety and performance tests and have been approved by both the clients and the production executive, what is left to do is to hand the new products over to the production department for mass production. Before starting mass production, a trial production run has to be initiated to see whether the new products can be produced successfully and without problems. Even though the NPD team takes the capacity and capability of its production facilities into consideration

in the early stages of product innovation (e.g. in the planning and design stages), they may still encounter problems such as technical glitches or poor quality. In order to solve these problems, the team may be forced to make minor or major alterations. In the worst case scenario, they may be forced to re-start the design process.

After looking into the key stages of product innovation, it is clear that product innovation can be rather complex due to all sorts of unforeseen contingencies and problems throughout the process. Therefore, team members are likely to find themselves moving back and forth between different stages in order to resolve these problems. Hence, product innovation processes in Company F are typically iterative and complex processes, rather than simple or straightforward.

7.4 Teamwork for Product Innovation: What Matters?

For those who work in Company F's NPD team, teamwork for product innovation is a very complex matter. Let us consider (1) how their team is managed, (2) patterns of interpersonal interaction, and (3) training and creativity.

7.4.1 Team Management

7.4.1.1 The role of the family owners

As mentioned previously, the founder as the chairman is still in charge of the day-to-day management of the firm and governs it in a centralised manner. However, unlike Company G's owners, who are keen to reinforce family control by dictating R&D decisions, Company F's founder and other

family executives choose to entrust and empower the non-family production executive to take care of R&D operations. Although the founder has tight control over the firm's finances and macro governance, he normally would not interfere in how the production executive manages the 'technical side of business operation' (e.g. technology, product innovation) (interview record: #0305). As a supportive top executive, the chairman keeps a watchful eye on the progress of the team. For example, he may give the product development team some comments on the prototypes or on the finished product when he does his daily inspection by walking around the factory (interview records: #0301, #0302). If the team needs resources or funding for radical projects, the chairman normally supports them (interview records: #0304, #0305). Even though the chairman does not participate in the development of new products, his trusting attitude and support are vital for the team because with the full support of the top executive, the NPD team can focus on what they do best (e.g. product innovation), without having to worry about interference from the owners.

7.4.1.2 A hierarchical, top-down teamwork pattern

Like their firm which is managed in a centralised manner by the owners, the NPD team is also managed in a highly hierarchical fashion. At the top of the hierarchy, the production executive as the team boss has very concentrated power to dictate all key R&D decisions. With abundant experience and technical competence, he usually gives the team sets of clearly defined goals and targets to guide them. Besides making key R&D decisions, he is also responsible for dealing with foreign clients and for the marketing of new products.

In the middle of the hierarchy, the team manager as the project manager is the one who organises, plans, coordinates and executes product development project. As explained earlier, he is responsible for developing detailed plans and the overall framework for the new products, dividing R&D tasks and setting work schedules. As the chief coordinator, he has to track the progress of the NPD projects to make sure everything is on the right track. As a mentor and supervisor, he carefully assesses subordinates' work progress and provides necessary support accordingly.

At the bottom of the hierarchy, although as junior team members they do not get to participate in decision-making or the planning of new products, the four technicians are given considerable autonomy and freedom to carry out design tasks. The two managers assess their work on a daily basis and provide feedback (e.g. identifying problems in their design and what to do) based on individual performance. As long as the junior members are able to complete tasks assigned from the top, the two team managers generally do not intervene in how their subordinates carry out their tasks (interview records: #0301, #0302, #0304). If the team members have problems, they would approach the team manager to seek support and advice, as only the team manager and the production executive have the power to make decisions. One team member explained:

'If we have a problem like difficulties coordinating with our marketing people, both of us have to speak to our team manager. It's like a tradition or a policy in our firm that everyone in the company knows only our team manager and our production executive have the power to make decisions or arrangements about new products. We subordinates do not have such power' (interview record: #0302).

Overall, this hierarchical, top-down teamwork pattern seems to work well because everyone works hard to fulfil their own responsibilities, knows who is doing what, and where to get help when they have problems. The two managers' centralised control and ability to give coherence and sensible guidance to the team are also indispensable to the team's success (interview records: #0302, #0305).

7.4.1.3 Cross-functional coordination

Company F's R&D personnel not only have to work with fellow team members, but they also have to work with various external parties outside of team boundaries, such as other departments in the firm, clients and suppliers throughout the development of new products. The team manager as the chief coordinator has to track all these coordination activities and adjust plans accordingly. Coordinating activities can be divided largely into two types: internal coordination and external coordination. Comparatively speaking, internal coordination is relatively less problematic compared to external coordination, since the two team managers have very centralised control over their team members, while all of the team members share the same goal and work hard and help each other to achieve collective goals (interview record: #0301, #0302, #0304, #0305).

In contrast, coordination with external parties is often plagued with conflicts of interest. In terms of working with other internal departments, the NPD team has to make sure that all its internal departments collaborate with each other and make all necessary changes necessary for the installation of new products. However, under Company F's MBO policy, each department is self-interested in prioritising its own performance targets, and therefore

may resist changes needed for the new products. One team member pointed out:

'Our department can be considered as an "indirect department" because we are not directly involved in the production processes. ... From this "indirect department perspective", we have to consider all aspects of the business operation in our firm such as building models, processing and assemble components as well as the packaging and the delivery of our products. We are not like the production departments, which only deal with production. From a coordinator's point of view, we have to evaluate different opinions or problems expressed by various departments carefully and objectively. Every department will only reflect problems or opinions from their points of view' (interview record: #0305).

Taking collaboration with the production departments as an example, under company F's cost-cutting policy, the NPD team is not given exclusive facilities to develop prototypes and run tests, so it has to negotiate with the production departments to access production facilities (interview record: #0305). However, production personnel are often reluctant to lend their facilities and personnel to the NPD team, since they are more interested in meeting their own performance targets such as meeting daily production quota (interview records: #0302, #0305). If the NPD team members are unable to negotiate access to production facilities, they have to ask their team boss (i.e. the senior production executive) to step in because only he has the seniority to order other department heads to collaborate (interview record: #0305). Office politics and conflicts of interests over competition for scarce production resources often cause delays and are also very demoralising for junior team members, who lack the requisite bargaining power (interview records: #0301, #0302, #0304).

Besides coordinating with the production department, the team also has to work with clients, suppliers and other strategic alliances. In terms of clients, the team boss carefully assesses their needs and does as much as he can to satisfy them. In addition to collaborating with clients, the NPD team also has to work with suppliers to ensure the steady supply of raw materials and outsourced parts. In order to cut costs, the team has outsourced considerable parts of its products to suppliers, so the NPD team must keep in touch with its suppliers to ensure the outsourced parts can be delivered on time and to a satisfactory standard (interview record: #0305). In addition to clients and suppliers, they also have to work with other strategic alliances such as trading bodies, research institutes, vocational schools and colleges. For instance, they would attend seminars or training programmes hosted by research institutes, as these training courses may inspire creative ideas for new product designs or teach them how to apply state-of-art technology on their products or on manufacturing procedures (interview records: #0304, #0305).

7.4.1.4. Pursuit of cost-effectiveness

Like most manufacturers in Taiwan, Company F also relies on its cost-effectiveness to survive, so the NPD team has to deliver new products cost-effectively and swiftly (interview record: # 0305). As they only have limited resources and R&D budget, the R&D personnel have to control how much they spend on product development. The lack of adequate funding and resources can constrain product designs, and as a result they usually prefer incremental/copycat innovation over expensive radical designs (interview records: #0301, #0302, #0305). For example, one team member

explained:

'We do not have the resource or manpower for developing radical new products. Our managers prefer copycat innovation because it would be very difficult for us to do radical innovation. For example, we do not have the manpower to do extensive market research, which is essential for identifying potential customer demand when developing original, radical new products' (interview record #0302).

7.4.2 Interpersonal Interaction

In addition to team management, interpersonal interactions are also an important part of teamworking. This section will look into (1) the conservative, hierarchical work climate, (2) concern for interpersonal harmony, (3) conformity pressure and latent dissent, (4) communication problems cause by the generation gap, and (5) a shared sense of responsibility and hard-working spirit.

7.4.2.1 A hierarchical work climate

Like many mature family firms in the region, Company F also has a conservative, hierarchical work climate. For example, R&D personnel use hierarchical roles and last names (i.e. 'manager Chen', 'production executive Dai') to greet each other instead of more intimate first names. Besides being used as identities, hierarchical rankings can also have influential effects on interpersonal interactions. For instance, all of Company F's workers are acutely aware of hierarchical differences and would behave according to their relative roles/statuses. For the two managers, they work hard to set good examples to their subordinates, share their expertise, help them to sort out technical problems, and provide them with feedback on tasks

(interview record: #0305). For the subordinates, although their two team bosses are nice, approachable and do take care of them, they are also superiors whose authority should be respected. Therefore, they act submissively and obediently towards the two managers and carry out their instructions and decisions diligently as a gesture of loyalty and respect (interview records: #0301, #0302, #0303, #0304).

7.4.2.2 Concern for interpersonal harmony and an objective attitude towards conflict

Generally speaking, Company F's R&D personnel are eager to maintain seemingly harmonious work relationships with colleagues because good work relationships are crucial for fitting in, collaborating and surviving in the workplace (interview records: #0301, #0302, #0303, #0304, #0305). This concern for a harmonious work relationship can have influential effects on how they deal with conflict or coordination tasks. For instance, they would be considerate of other parties' standpoints, give others "face", or accept compromises in order to maintain good relationships for the sake of future collaboration (interview records: #0302, #0304). For example, one team member mentioned:

'We have to show consideration for other people's feelings and face, because we have to work together in the future. Good relationships can help our future collaboration, so I try to maintain a good relationship with them. If you antagonise them, it will be difficult to work with them again. Some people are like that. ... So I would be careful what and who I speak to. If I worry that my ideas may offend them, I keep my ideas to myself and say nothing' (interview record: #0302).

Besides being considerate, they also take an objective attitude towards dealing with task-related conflict or dissent and try to come up with most feasible solution without antagonising others (interview records: #0301, #0302, #0305).

7.4.2.3 Pressure to conform and latent dissent

Company F's hierarchical work pattern and its emphasis on preserving harmonious work relationships can impose considerable conformity pressure on R&D personnel. Under seniority rule, they generally would not dare to debate superiors' instructions for fear of antagonising the bosses. If they have doubts, they may still carry out the task using the superiors' approaches and may only express dissent if they find evidence to prove that the approach does not work or works less well compared to alternative approaches (interview records: #0301, #0305). For example, two team members explained:

'If I have doubts about superiors' ideas, I still use my superiors' approach first. I would prioritise his ideas. If his idea does not work, I then use my own ideas and tell him it would be better to use my approach. But this can only happen if his approach has failed. I think that it is the same between me and my subordinates. My subordinates do not dare to object to my ideas and they just do what I tell them to do' (interview record: #0305).

'If the owners or our team boss want us to do something, then we just have to do it. The bottom line is that we have to deliver results to prove whether their ideas work or not. If the result shows that his idea does not work, then we can tell him that he is wrong' (interview record: #0302).

Besides this 'conform first, dissent later approach', team members may

express instant dissent if they have relevant expertise in relation to the topic in discussion (interview records: #0301, #0304, #0305). Even if they are willing to share their thoughts, they will not stubbornly insist on their ideas, as they have to show proper respect towards colleagues or superiors' authority and expertise (interview records: #0301, #0302, #0304, #0305). For instance, one team member stated:

'If I do not agree with my superiors, I may share my thoughts. It depends on the situation and on the ideas really. But I would not try to persuade them or stubbornly insist on my ideas. I will respect their ideas and prioritise their ideas. After all, they have been working here for several decades and they have lots of expertise in design' (interview record: #0304).

7.4.2.4 Communication problems caused by the generation gap

As mentioned earlier, there is a considerable 10-15-year age gap between four senior baby-boomer team members and the two younger X, Y generation members. The considerable age gap can lead to communication problems because the two generations see things rather differently as summarised in Table 7.1. On the one hand, the two baby-boomers pointed out that their younger workers are very different compared to themselves, in that they are rather strong willed, can be reluctant to listen to others, lack professional and interpersonal skills, and are less committed to their firm (interview records: #0304, #0305). One of them explained:

'In our group, there is a more than ten years age gap between the senior and junior group members and I don't know the exact cause of this gap. It's fairly common in family firms though. ... Our younger workers are very, very different compared to us senior workers. We have to teach them a lot of things, like how to do their

work step-by-step. We want to train them well, but sometimes they just won't listen, especially the younger ones' (interview record: #0305).

On the other hand, the younger X, Y generation workers also think that there is a considerable generation gap between them and the baby-boomers. For them, their mature colleagues, who have been working for decades, are more accustomed to certain ways of doing things and the firm's conservative work climate, so they can be reluctant to accept the youngsters' dissent or ideas (interview records: #0302, #0303). For example, one team member stated:

'Some of our colleagues have 20, 30 years of tenure, so that they often do not accept us junior workers' suggestions or ideas. ... They just won't listen to us. They think very differently, so there is a generation gap. Therefore, if I have to coordinate with others like the production people, I look for people who are at my age because it is easier to communicate with them' (interview record: #0302).

Judging from these examples, it is clear that the two generations do see things differently. Comparatively speaking, the older baby-boomer team members seem to be more accustomed to their firm's hierarchical, conservative work climate and seem to be more attached to the company. In contrast, their younger colleagues seem to prefer a more open, egalitarian work climate and are keener to try new approaches and learn different skills. Besides causing communication problems, the age/generation gap is also a key reason behind the high turnover among young workers, since they often feel it is hard to fit in with the firm's majority conservative mature workers.

Table 7.1: Example of the generation gap observed in Company F’s NPD

team

	Baby-boomers’ perception of X, Y generation	X, Y generations’ perception of baby-boomers
Examples of the generation gap	<ul style="list-style-type: none"> • Lack of interpersonal skills. • Have little professional skill and take a long time to learn to get on with their jobs. • Lack of leaning spirit. • Strong willed and therefore often are reluctant to listen. • Lack of cohesion towards the firm. • Think very differently. 	<ul style="list-style-type: none"> • Old-fashioned, care too much about hierarchy and interpersonal harmony. • Are used to certain ways of doings things and therefore can be reluctant to accept or listen to new ideas or approaches. • Think very differently.

7.4.2.5 A shared sense of responsibility and a hard-working spirit

In a way, company F’s NPD team members generally take their responsibilities seriously and also work hard to complete their tasks on time. Several factors can be attributes to this shared sense of responsibility and hard-working spirit, such as the company’s MBO policy, the interdependent nature of teamworking, the close interpersonal bond between team members, and concern for the collective good of the company. For instance, one team member noted:

‘Everyone in our firm has their own responsibilities and performance targets, which they have to fulfil. All of us work hard, since we all want to fulfil our own responsibilities and improve our performance. But we cannot just think of our own goals and performance. We also have to be considerate of others and collaborate with other departments because, at the end of the day, all our efforts are for the sake of the collective good of our firm’ (interview record: #0304).

Another team member also stated that under the influence of the shared sense of responsibility and hardworking spirit, they would not only work hard to complete their own tasks, but they would also help each other and actively provide support, especially to inexperienced junior team members. He stated:

'Everyone in our team will try his best to complete his own tasks and responsibilities. None of us will slack behind and expect others to pick up our slack. No, we are not like that. Instead, we keep an eye on each other and help each other out if we notice that someone is struggling with their work, such as the newcomers' (interview record: #0303).

7.4.3 Training and Creativity.

Besides team management and interpersonal interactions, other aspects of team working such as the role of training and creativity are also important for those working in Company F's NPD team. This is because how knowledge and creativity are utilised, exchanged or transferred can be vital to the success of a new product. This section will look into (1) the lack of training and (2) constraints on creativity.

7.4.3.1 Lack of adequate on-the-job training

Although most of the R&D personnel are keen on learning, there is no comprehensive on-the-job training in their department (interview records: #0301, #0302, #0304, #0305). They are only offered a brief induction session and some leader-subordinate mentoring (interview records: #0301, #0302, #0303). The lack of training can have two implications. First,

without systematic training, rookies have to rely on learning by doing and asking around for advice in order to get on with their jobs (interview records: #0302, #0303). Although superiors and senior colleagues would share their knowledge and expertise through discussion and problem-solving scenarios, the lack of guidance can be frustrating for the junior team members (interview record: #0302).

Second, besides the lack of training, Company F's R&D personnel are given tasks within a specific area because their senior R&D managers want to encourage them to focus on one core area of expertise. However, young R&D personnel generally dislike doing repetitive or similar tasks because they are keen to learn different skills and accumulate experience. The lack of training and opportunities to learn diverse skills is one of the main reasons why Company F has been having trouble retaining young talent on a long-term basis. For instance, one junior worker expressed his intention to leave because of the lack of training:

'I have learned quite a bit since I joined this firm. But I am not going to stay, because I have been doing similar tasks all the time. They are all the same and there is nothing new to learn. For us new youngsters, we only come here to learn. I think that I have learned enough here. I would like get out and learn something else outside' (interview record: #0302).

7.4.3.2 Creativity: opportunities and constraints

Generally speaking, the R&D personnel are given considerable autonomy in order to encourage them to apply their creativity to their tasks (e.g. design). Furthermore, they can also submit their ideas as written reports to their firm's 'proposal appraisal panel', which is designed as a

bottom-up communication channel to encourage junior employees. If their proposals are accepted, they win small cash rewards¹³ and extra points on their individual performance appraisal (interview record: #0301, #0302).

Although the R&D personnel are encouraged to apply their creativity as they see fit, it does not mean that they are allowed to let their creativity roam free. There are three factors which constrain how they carry out product innovation: (1) concern over cost and efficiency, (2) hierarchical work climate, and (3) the nature of their products.

First, company F's NPD personnel are very concerned about cost-effectiveness and efficiency, which may constrain how creative they can be or allowed to be when it comes to designing new products (interview records: #0304, #0305). This is because they have a very limited budget to spend on NPD projects, so they have to be very cost-conscious. As a result, the two team managers have a very low tolerance for failures and mistakes, as they are under constant pressure to deliver new products swiftly and cost-effectively. Hence, low-risk incremental innovation is regarded as a safer option as compared to risky radical innovation. For example, one team member pointed out that given the tight budget, they really cannot afford mistakes or errors because these can cost money and lead to delays (interview record: #0305). He explained:

'We should not make mistakes, from the very beginning to the very end. For us R&D personnel, mistakes can be costly, both in terms of money and time. If we didn't spot mistakes in the beginning and only find out that things are not right, we will have to start over again or make major alternations. Both can lead to huge losses because it takes time and money to fix such problems. Therefore, our R&D personnel have to be meticulous about their designs' (interview record: #0305).

Second, in addition to concern over cost-effectiveness, the company's conservative, hierarchical work climate can also inhibit creativity and undermine the exchange of creative ideas. With concentrated power at hand, the team boss is the only one who can be as creative as he likes because he has the means (e.g. concentrated power and access to resources) to make his creative ideas work (interview records: #0302, #0303, #0305). In contrast, his subordinates do not have the power or resources to make necessary changes to support their ideas, so they just have to learn to be creative within limitations (e.g. tight budget, limited resources) (interview records: #0301, #0302, #0304, #0305).

Third, besides to the lack of funding and the hierarchical work climate, the nature of their products is another factor shown to impose limitations on product designs. Most of their products are components for plumbing-related products (e.g. valves, boilers), so compatibilities with other plumbing-related components are crucial for the success of their products (interview records: #0302, #0305). One team member pointed out that their clients often reject radical new products over concerns about the compatibility between the new parts and existing components (interview records: #0305). This can be frustrating for them because they lose money and effort if their clients reject their radical new products (interview records: #0302, #0305). For instance, one team member explained:

'We have improvised one of our valve products and recommended it to our clients. The advantage of the new design is that the cost would be much lower compared to the old design. But that client refuses to accept the new design. They prefer the old design because they have to consider compatibility of the valve with other

plumping components, regardless of how good the new design is. We have done lots of tests to prove that the new one is better, but the client still refuses to accept the new design' (interview record: #0305).

7.5 Teamwork Outcome

Overall, the team members' teamwork efforts can lead to two types of team outcome: collective outcome and effects on individual team members. In terms of the collective outcome, the NPD team delivers more than a dozen new products per year (interview records: #0304, #0305). However, the great majority of these are incremental improvements on existing products or copycat imitations of competitor's products, while radical, original new products are very rare (interview records: #0302, #0304, #0305). Company F's pursuit of cost-effectiveness and efficiency, its hierarchical work climate and insufficient manpower are the main reasons why the NPD team prefers incremental innovation. Even though radical new products are rare, both incremental and radical new products are beneficial for boosting Company F's financial performance, as it has been a highly profitable business for several decades (interview record: #0305).

Besides collective team outcomes, the experience of working in teams can also have important effects on individual team members. Although most team members seemed content with their experience of working in NPD teams, there are some issues which they were not happy with, such as low salary, lack of training, the generation gap and the firm's conservative, and the hierarchical work climate (interview records: #0301, #0302, #0304, #0305).

7.6 Chapter Summary

This case study explores teamwork for product innovation in Company F, which is a longstanding family-owned Taiwanese manufacturer. The findings reveal that Company F's NPD team is managed in a centralised, hierarchical manner. At the top, the two managers have very centralised control to make R&D decisions and plans, so their coherent and sensible instructions are vital for the efficiency of the team. At the bottom, even though junior team members have no say over R&D plans or decisions, they are given considerable autonomy to encourage them to apply their creative ideas to their tasks. Their team managers normally do not interfere and instead give them feedback on their work on a daily basis. In a way, this top-down team work pattern seems to work well given that, as a team, they are able to deliver new products efficiently and successfully. The team managers' sensible plans and guidance, combined with a shared hard-working spirit, are the key factors behind Company F's NPD success.

Yet, on another front, this work pattern is not without its drawbacks. The highly hierarchal work pattern can impose high conformity pressure and thus put junior team members off sharing thoughts or concerns. Younger X, Y generation workers seemed to dislike such a traditional approach and sometimes find it difficult to fit in with their conservative baby-boomer colleagues. The generation gap, combined with low wages and the lack of training, can contribute to staff high turnover among young R&D personnel. The R&D managers may consider addressing these issues for the sake of retaining young talent and for team competitiveness in the long run.

Chapter 8 Key Findings: a Cross-Cases Review

8.0 Introduction

This chapter compares the key findings from the three case studies. The first part of the chapter reviews similar teamwork processes found across the case studies. The second part discusses the effects of team context on teamwork for innovation in CFB NPD teams. The third part of the chapter looks into two key differences found across the case studies: (1) differences in owner involvement in the development of new products and (2) different levels of on-the-job training. Finally, the chapter concludes with a brief chapter summary.

8.1 Similar Team Processes

Generally speaking, several common team processes were observed across the three case studies: (1) a hierarchical teamwork pattern, (2) a pattern of leader-subordinate interactions similar to authoritarian mentors and their obedient apprentices, (3) the pursuit of efficiency, cost-effectiveness, and pragmatism, (4) concern for interpersonal harmony, (5) high conformity pressure, and (6) a hard-working spirit.

In a way, NPD teams in CFBs are typically managed in a highly centralised, hierarchical manner. Managers have very concentrated power at hand to dictate most decisions and make plans for NPD projects, while their subordinates mainly play supporting roles by executing instructions and carrying out all the legwork. Under this top-down teamwork pattern, interactions between team leaders and their subordinates are like

authoritarian mentors and their obedient apprentices. On the one hand, team leaders behave as mentors who constantly monitor their subordinates' progress and provide necessary support such as sharing know-how, helping them to resolve problem and modifying their design accordingly. On the other hand, subordinates, especially young junior members, are eager to learn from their team leaders so that they would carry out top-down assignments diligently as this helps them to learn by doing.

For those who work in CFB teams, efficiency, cost-effectiveness and pragmatism are considered far more important than novelty when it comes to designing new products as their firm rely heavily on cutting cost and efficiency to survive. As a resort to the hefty workload and shortage of manpower brought by constant cost-cutting, their R&D personnel have to work hard to fulfil their responsibilities. They would also be considerate of relevant others for the sake of smooth collaboration and maintaining a seemingly harmonious long-term work relationship as these elements can be vital for collective efficiency.

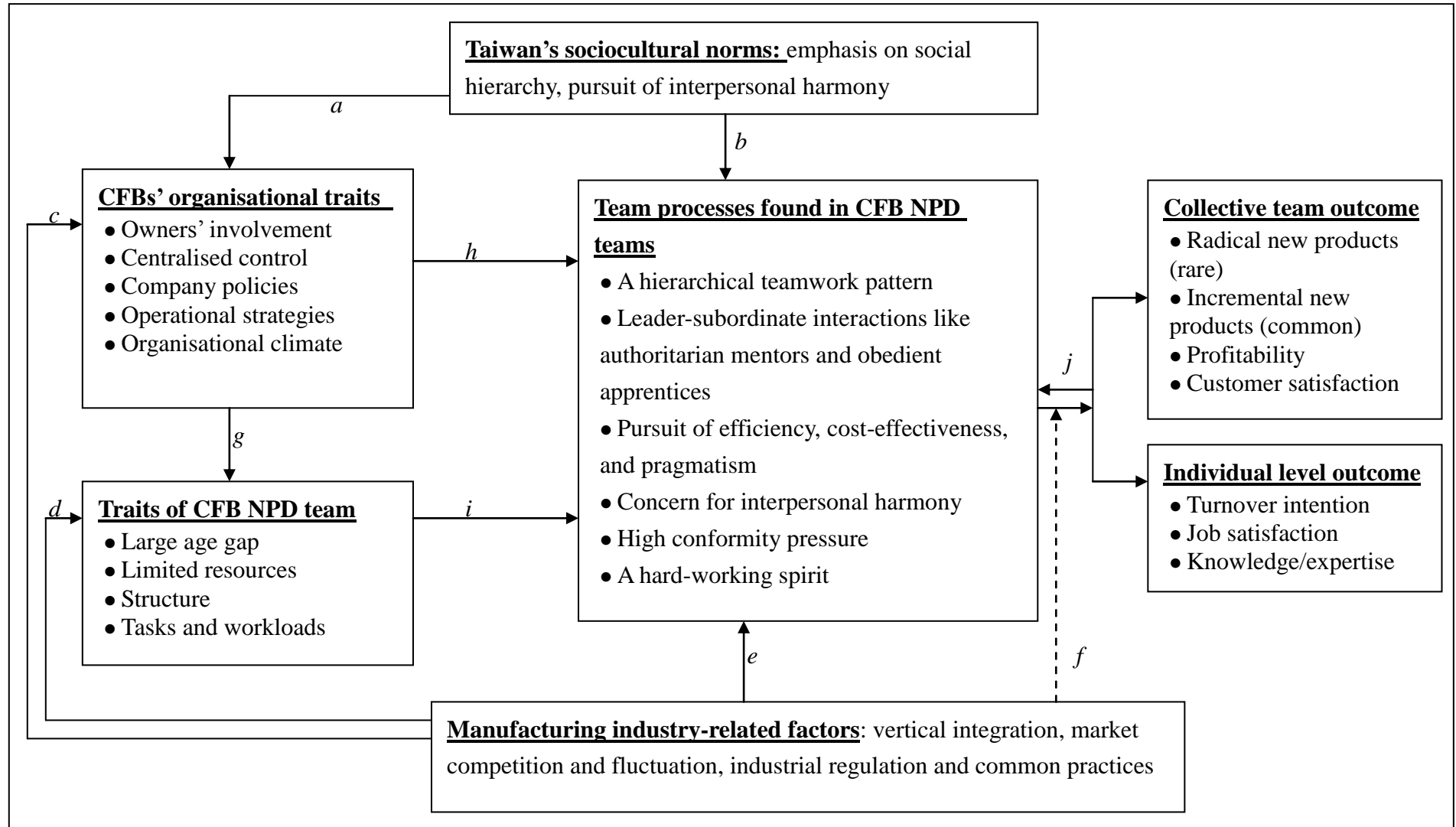
Even though such teamwork pattern seems to work fine as all the NPD teams in three CFBs were able to deliver new products efficiently and swiftly through this approach (interview record: #0101, #0106, #0201, #0305), it is not without its problems. First, centralised control combined with the hierarchical work arrangement can impose high conformity pressure on junior team members and deter them from expressing creative ideas or dissenting. Second, the constant pursuit of efficiency and cost-effectiveness means that there is a tendency toward risk-aversion. Team members are often encouraged to stick to low-cost, practical 'conventional' options rather than trying radical and potentially more costly new ideas/approaches (e.g.

radical new design or cutting edge technology). As a result, they may not be able to make the best of team members' creativity.

8.2. Complex Effects of Team Context: a Multi-level Review

As explained earlier, one of the objectives of this study is to explore how teams' contexts affect the way they work and innovate. From a cultural insider perspective, I have identified four sets of contextual factors shown to have influential effects on how CFB teams work and innovate: (1) sociocultural norms, (2) manufacturing industry-related factors, (3) CFBs' organisational attributes and (4) team characteristics. As illustrated in the empirical framework in Figure 8.1, these four sets of contextual factors are interrelated. They have crucial effects on shaping the unique teamwork patterns observed in CFB teams and thus may affect collective team outcomes (e.g. radical or incremental new products which they develop) and individual outcomes (e.g. individual team members' job satisfaction or intention to leave). First, in terms of societal level contexts, Taiwan's sociocultural norms related to social hierarchy, interpersonal harmony and diligence are found to have influential effects on shaping a CFBs' organisational climate and patterns of interpersonal interaction and communication in its teams.

Figure 8.1: An empirical framework of teamwork for product innovation observed in CFB NPD teams



Second, in terms of industrial-level contexts, three sets of manufacturing industry-related factors, namely vertical integration, market competition and fluctuation, industrial regulation and common practices, are said to have significant effects on CFBs and their teams. These industrial contexts are important references for CFB executives when adjusting operational strategies and setting targets for NPD projects. For NPD teams as a whole, these contextual factors may affect how much resource and manpower they are given, how they carry out designs and run tests as well as how they manage collaboration with clients. The collaborations with external strategic alliances (e.g. clients or trade bodies) may, in turn, moderate the relationship between the team processes and team outcomes.

Third, in terms of organisational-level contexts, CFBs' key organisational characteristics including owner involvement, centralised control, operational strategies, company policies and organisational climate are found to have significant effects on how NPD teams are structured and how they work and innovate.

Finally, in terms of team-level contexts, the age gap or age diversity commonly found in CFB teams, their limited resources, stability of the team structure, the tasks, and workloads are found to have considerable effects on how team members interact and communicate. The following sections provide a more in-depth review of the effects of the four sets of contextual factors on CFBs and their teams.

8.2.1 Effects of Sociocultural Norms

In terms of the effects of sociocultural-level context, consistent with what researchers (Farh, 1995; Redding, 1995; K.-S. Yang & Yeh, 2005; T. F.-L. Yu,

2001) have found, Confucian familial values related to social hierarchy, interpersonal harmony and diligence were found to have influential effects on corporate governance and how CFB teams work. The effects of these sociocultural norms on CFBs and their NPD teams are summarised in Table 8.1.

Table 8.1: Effects of sociocultural value on CFBs and their teams

Taiwan's Sociocultural values	Effects on CFBs as a whole (shown as path <i>a</i> in Figure 8.1)	Effects on team dynamics observed in CFB teams (shown as path <i>b</i> in Figure 8.1)
Emphasis on relative social hierarchy	<ul style="list-style-type: none"> • Centralised control • Implicit emphasis on hierarchical status/large power distance 	<ul style="list-style-type: none"> • Hierarchical, centralised control • Large power distance • Top-down communication which can obstruct the exchange of creative ideas
Pursuit of interpersonal harmony	<ul style="list-style-type: none"> • Superficially harmonised relationships between departments for the sake of smooth cross-functional coordination 	<ul style="list-style-type: none"> • Individuals would suppress their negative emotion and be considerate of others in order to sustained superficially harmonious vibe and functional work relationship with team-mates and external parties • Team members' pursuit of interpersonal harmony may undermine communication. • They would try to avoid causing or engaging in conflict by conforming or yielding to others
Diligence and a sense of responsibility	<ul style="list-style-type: none"> • Management by objective - employees would fulfil their responsibility diligently 	<ul style="list-style-type: none"> • A hard-working spirit: everyone takes responsibilities seriously and work hard to fulfil their responsibility.

First, societal norms and values related to hierarchy (e.g. emphasis on relative hierarchical status, showing respect towards those who have higher

status or are more senior, and mighty is right) are important cultural antecedents behind the centralised control and conservative, hierarchical work climate in CFBs and their teams. Under the constraints of values related to social hierarchy, members of NPD teams in general are very sensitive towards hierarchical status and act in accordance with their status, such as behaving submissively towards superiors. This emphasis on hierarchical status has led to the large power distance and top-down communication, which are also shown to undermine communication in NPD teams. Most junior team members pointed out that they would not challenge superiors' instructions, as they are under pressure to conform and show respect in order to survive and fit in (interview records: #0107, #0111, #0202, #0205, #0206, #0107, #0209, #0210, #0301, #0302, #0305) For instance, two interviewees stated:

'I personally think that it's ok that the owners still emphasise social hierarchy in the firm and use it to manage people, but they should not overdo it. I think they have overemphasised these hierarchical differences in our firm. Today, Taiwanese society as a whole has evolved from the old feudal system into a more modern, open and equal society. I wonder why they can't just follow this societal trend. Why do they still insist on hanging on to these old-fashioned concepts? ... I think we should not pay too much attention to the hierarchical differences or the differences in status, but fine, I would conform since I work for them' (interview record: #0205).

'After all, only the superiors can make decisions. I am just doing tasks assigned from the top. So I would not try to debate their ideas. They would only listen to those who have higher status or more expertise anyway' (interview record: #0111).

Second, sociocultural norms related to interpersonal harmony also have

influential effects on CFBs and their teams. Under the influence of societal values related to interpersonal harmony, CFB workers generally are willing to make concessions, behave in a yielding manner, suppress negative emotions, and be considerate of others for the sake of maintaining seemingly harmonious work relationships and avoiding open confrontation. For CFBs as a whole, concern over interpersonal harmony is beneficial for cross-function coordination, as representatives of different departments are willing to compromise and collaborate with each other for the sake of harmonious work atmosphere. For instance, one interviewee stated:

'If everyone can try to manage harmonious work relationships with each other, then we can all work together smoothly' (interview record: #0210).

In addition to affecting CFBs as a whole, the value of interpersonal harmony can also have significant influences on their NPD teams. On the upside, teams are able to work efficiently as a harmonious work atmosphere is created to encourage collaboration. In order to sustain this harmonious work climate, individuals show considerations towards others and would conceal their negative emotion and act in a polite, diplomatic manner. They would also adopt an objective attitude to deal with task-related conflict and try to reach win-win or best solutions for both parties. On the downside, the concern over interpersonal harmony can put them off sharing candid thoughts. They are rather cautious about what they say and would withhold potentially controversial information or ideas to avoid antagonising others. For instance, one interviewee stated:

'We have to show consideration for other people's feelings and face, because we have to work together in the future. I try to maintain a good relationship with them because good relationships can be beneficial for working with them in the long-run. If you antagonise them, it will be difficult to work with them again. Some people are like that. ... So I would be careful what I say and who I speak to, if

I worry that my ideas may offend them, I would keep my ideas to myself and say nothing' (interview record: #0302).

Team members' reluctance to express opinions for the sake of preserving interpersonal harmony may also undermine collective team effectiveness and the psychological well-being of their team members. For instance, the team as a whole may not be able to tackle problems swiftly, as their team members are reluctant to point fingers at others, express concerns, or report potential problems or wrongdoings. For individual team members, the pressure to suppress negative emotion for the sake of interpersonal harmony may also hinder their psychological well-being in the long run, such as causing depression or psychological burnout.

Third, consistent with what researchers (Farh, 1995; Katila, 2010; Redding & Wong, 1986) have found, the findings of the present study also indicate that diligence is a widely shared work ethic among Chinese workers. Cultural values related to diligence and responsibilities were shown to be the cultural antecedents of a shared hard-working spirit and strong sense of responsibility observed across the three CFB teams. For instance, many of the interviewees stated that they would work hard to fulfil their responsibilities and give all they could, even though they were unhappy about certain aspects of their work (e.g. leaders' authoritarian behaviours, hefty workloads, red tape or low salary) (interview records: #0103, #0107, #0110, #0202, #0204, #0205, #0206, #0207, #0208, #0209, #0210, #0301, #0302, #0304, #0305). For instance, one interviewee stated:

'I think that getting my tasks done is the right thing to do. It's not about getting rewards or something like that; it is simply our obligation to get our work done and to do it well' (interview record:

#0210).

Clearly, the three sets of sociocultural values can have influential effects on how CFB teams work and innovate.

8.2.2 Effects of Industrial-level Context

Although the industrial context was not included in the theoretical framework, the findings suggest that key characteristics of the manufacturing industry can affect NPD team structure, tasks, and how they work. As explained in the methodology chapter, I selected manufacturing CFBs as the sample because they are perhaps the most common type in Taiwan due to the fact that manufacturing industry is the largest industrial sector and most representative of the country's export-oriented economy (W.-w. Chu, 2009; Shih & Wickramasekera, 2011; C.-H. Yang & Kuo, 2009). The findings indicate that three sets of manufacturing industry-related factors, including vertical integration, market fluctuation and competition and industrial/legal regulation and common practice, can have influential effects on CFBs' corporate governance, the structure and resources given to their NPD teams, and on how NPD teams carry out product innovation. Industry-related factors may also moderate the relationship between CFB team processes and the outcomes of their teamwork effort, as illustrated as path *f* in Figure 8.1.

First, vertical integration, which means a high level of collaboration between upstream suppliers and their downstream clients, is shown to have influential effects on CFBs as a whole as well as on their NPD teams. Generally speaking, manufacturing industry is highly integrated and largely

a 'buyers' market' in which buyers have high bargaining power and can make all sorts of demands. In such a market, most Taiwanese manufacturers are keen to cultivate long-term collaboration/networks with main clients in order to survive and gain business (D. Ip, 2000; T.-R. Lee & Koh, 2009; Luo & Yeh, 2002; Siu, 2005) and the three CFBs investigated in this study are no exception. For instance, they all adopt a client-oriented product innovation strategy by providing tailor-developed products and services (e.g. pre-sale consultation, post-sale service, speedy delivery, swift response to complaints), which are designed based on clients' individual needs (interview records: #0101, #0103, #0104, #0105, #0106, #0107, #0109, #0110, #0111, #0201, #0203, #0204, #0209, #0301, #0305). As a result, client demands and needs can have influential effects on how much resources and manpower are given to NPD teams, as more complex and difficult projects require more resources to complete. In addition to affecting team structure, collaboration with strategic alliances (e.g. clients and suppliers) can also affect CFB team dynamics and outcomes. For instance, the teams often invite client to review prototypes and participate in the testing of prototypes. Collaboration with clients and suppliers throughout the development of new products may have positive and negative effects on the teams and NPD projects. On the upside, the collaboration may inspire individual creativity, or help the team to improve new product designs, detect possible defects, and reduce risks. For instance, by seeking clients' review of the prototypes and the test results before proceeding to the next phase of product innovation, the teams may get to detect problems and thus avoid investing more effort and resources in potentially flawed designs (interview record: #0101, #0103, #0104, #0105, #0107, #0201, #0204,

#0301, #0302, #0304). On the flipside, clients' negative remarks on product designs may put R&D personnel off trying similar designs (interview records: #0105, #0106, #0107, #0201, #0302, #0305). For instance, two interviewees explained:

'Everything we do is for our clients. No matter how good our designs are, they would be completely useless if our clients dislike them or do not want them. It's all about our clients and what they want' (interview record: #0105).

'We have improvised one of our valve products and recommend it to our clients. The advantage of the new design is that the cost is much lower compared to the old design. But that client refuses to accept the new design. They prefer the old design because they have to consider compatibility of the valve with other plumping components, regardless of how good the new design is. We have done lots of tests to prove that the new one is better, but the client still refuses to accept the new design' (interview record: #0305).

Besides restrictions on designs, client demands or complaints can also be stressful to deal with and can cause extra workloads. For instance, under a client-oriented product innovation policy, CFB NPD teams have to prioritise customer complaints and respond swiftly for the sake of customer satisfaction. Yet, prioritising client demands in such a way may derail existing work schedules and cause distractions, so that team members often have to work overtime in order to catch up (interview record: #0106, #0107, #0109, #0110, #0204, #0305).

Second, industrial or legal regulation and industrial practices are another set of manufacturing industry-related factors shown to have influential effects on CFBs and their NPD teams. As manufacturers, the three CFBs have to take legal and moral responsibility for their products, so they

are keen to obtain quality certificates (e.g. ISO certification) to show that they take these accountabilities seriously. CFB owners or R&D executives may adjust resources or manpower given to their NPD teams in order to comply with legal or industrial regulations. The regulations or recommendations can also provide guidelines for NPD teams regarding operational procedures and safety tests, which may, in turn, help to detect possible defects and reduce operational risks. For instance, in order to fulfil their legal obligation, CFB NPD teams have to run comprehensive quality tests to ensure that all the new products reach legal or industrial standards (interview records: #0101, #0103, #0104, #0105, #0109, #0111, #0201, #0304, #0305). Two interviewees explained:

'When we develop designs, we have to test whether they will pass legal regulation. We can only use those ideas which pass the safety regulation' (interview record: #0111).

'The first thing we think about when designing tyres is the legal regulation. This is because tyres are a type of commercial product with legal responsibility attached. So we have to consider legal limitations in different countries, such as America's DLT regulations and Japan's JIS regulations. Tyres are a global product because every country imports and exports them' (interview record: #0109).

Although regulations can help NPD team members to reflect on their designs by providing guidance, they may also impose restrictions, as the safety of the products overrides any novelty.

Third, in relation to market competition and fluctuation, CFBs generally are quite good at keeping up with market trends and reacting quickly to changes, such as shifting from focusing on manufacturing-oriented OEM

operations to more innovative ODM and OBM operations. NPD team leaders in CFB are constantly monitoring market situation and would adjust their strategy accordingly, given that market fluctuation can have decisive effects on the success of new products. For instance, they may reduce the budget given to R&D teams when the economy is in recession, or they may imitate competitors' successful products swiftly to cash in on a trend. The pressure to keep up with competition in the market can have positive as well as negative effects. On the upside, market fluctuation and competition may inspire team member creativity (e.g. use alternative materials to cut down costs or come up with a radical new design). Yet, on the flipside, in order to cash in markets trends and avert risk, CFBs' older baby-boomer managers often prefer incremental improvements of existing products and imitating competitors' popular product over embarking on developing radical new products (interview record: #0101, #0110, #0203, #0209, #0302).

Clearly, these three sets of manufacturing industry-related factors can have influential and complex repercussions for the three CFBs and their NPD teams. The effects of these factors are summarised in Table 8.2.

Table 8.2: Effects of industrial context on teamwork and innovation in CFBs

Manufacturing industry-related factors	Effects on CFBs as a whole (path <i>c</i> in Figure 8.1)	Effects on NPD team attributes (path <i>d</i> in Figure 8.1)	Effects on team processes (path <i>e</i> in Figure 8.1)	Moderating effects on team collective outcome (path <i>f</i> in Figure 8.1)	Moderating effects on individual team members (path <i>f</i> in Figure 8.1)
Vertical integration in manufacturing industry	<ul style="list-style-type: none"> • CFBs are keen to manage and sustain long-term collaboration with strategic alliances in the industry (e.g. clients, suppliers). 	<ul style="list-style-type: none"> • Clients' demands may affect team structure and resources given to the teams. 	<ul style="list-style-type: none"> • NPD teams' may collaborate with clients and suppliers throughout product innovation process. • Prioritising client demands and willing to make sacrifices and adjustments to respond. 	<ul style="list-style-type: none"> • Clients' and suppliers' feedback may help to detect possible defects and improve the quality and reduce the risks of the new products. • Clients' demands may lead to higher development costs. 	<ul style="list-style-type: none"> • Clients' demands can be stressful to deal with and can increase individual workloads. • Interactions with external parties may inspire creativity and help to gain and disperse knowledge and expertise.
Legal/industrial regulations and common practices (e.g. ISO certificates)	<ul style="list-style-type: none"> • Manufacturing CFBs are keen to apply for quality certificates (e.g. ISO) in order to win over clients. • CFBs have to comply with regulations. 	<ul style="list-style-type: none"> • Legal/industrial regulation or recommendation from quality certifying bodies may affect team structure and resources given to the team. 	<ul style="list-style-type: none"> • Legal or industrial regulation can provide guidelines for CFB teams. However, they may also impose restrictions on product design. 	<ul style="list-style-type: none"> • Complying with regulations and recommendations from quality certifying bodies may help to reduce risks, detect potential defects and improve trustworthiness of the new products. 	<ul style="list-style-type: none"> • Legal/industrial regulation or recommendation may help individual team members to reflect on their design.

(Cont.) Manufacturing industry-related factors	Effects on CFBs as a whole (path <i>c</i> in Figure 8.1)	Effects on NPD team attributes (path <i>d</i> in Figure 8.1)	Effects on team processes (path <i>e</i> in Figure 8.1)	Moderating effects on team collective outcome (path <i>f</i> in Figure 8.1)	Moderating effects on individual team members (path <i>f</i> in Figure 8.1)
Market competition and fluctuation	<ul style="list-style-type: none"> ● CFBs are good at responding to market changes via constant monitoring and quick responses (e.g. offer copycat products speedily). ● CFBs are gradually shifting from OEM to more innovation driven ODM and OBM operations to keep up with market trends. 	<ul style="list-style-type: none"> ● Market fluctuation (e.g. recession) may restrict how much resource given to the teams. 	<ul style="list-style-type: none"> ● Copycat innovation or incremental innovation is often considered a less risky and more practical option as compared to original or radical innovation which takes longer and is costlier and riskier to sell. 	<ul style="list-style-type: none"> ● Market fluctuation and competition can have decisive effects on the success of the new products. 	<ul style="list-style-type: none"> ● Team members would keep track of market competition (e.g. what's available in the markets). ● Market fluctuations (e.g. increasing costs of raw material) may inspire creative ideas (e.g. ideas to use different material to cut down cost).

8.2.3 Effects of CFBs' Organisational Attributes

According to the findings across the three case studies, five sets of organisational attributes have shown influential effects on their NPD teams: (1) owner involvement, (2) centralised control, (3) company policies, (4) operational strategy, and (5) organisational climate.

First, in terms of owner involvement, family owners' attitudes towards R&D operations have decisive effects on how much power and resources are given to NPD team leaders. If family owners do not want to take charge of the management of NPD projects, they would hire and empower professional managers, as evidenced in two out of the three family-owned firms studied. In contrast, if family owners desire to reinforce control and thus adopt a hand-on approach to NPD projects, they are unlikely to empower R&D managers to a great extent. This is what happened in case study two whereby the owners were reluctant to empower a professional manager or to appoint a clearly defined team leader, as they did not want to relax their grip on power. In addition to the effects on team structure, owner involvement can also affect interpersonal interactions in NPD teams. As a conservative and hierarchical work atmosphere is typical in CFBs, some team members feel uneasy about working alongside owners because they are constantly worried that their candid opinions may displease the bosses and thus jeopardise their career prospects or job security (interview record: #0202, #0209). Another negative effect of owner involvement is that their constant interference and incoherent instructions can seriously hamper efficiency and demoralise their R&D personnel (interview records #0201, #0202, #0204, #0205, #0206, #0208).

Second, the owners' centralised, hierarchical control in CFBs may have, to a certain extent, shaped the hierarchical, top-down teamwork pattern in their teams. NPD team managers generally have rather concentrated power to make decisions and assign tasks. Nevertheless, they would also give subordinates considerable freedom and autonomy, which is essential in designing and running experiments. Even though managers' tight control and close monitoring may help to keep things on track, their centralised control, combined with the implicit emphasis on hierarchical status, contributes to a large power distance and high conformity pressure in CFB teams.

Third, CFBs' company policies, such as MBO, cost-cutting policies, and the proposal-appraisal panel, are also shown to have considerable effects on NPD teams. Under MBO policy, everyone in a NPD teams is assigned a unique set of tasks and duties and that their individual performance will be evaluated against their responsibilities. Consequently, individuals would work hard to fulfil their responsibilities for the sake of their own performance appraisal. However, this self-interested orientation can also lead to conflicts of interest and coordination problems between NPD team members and colleagues from other departments, especially the production personnel. This is because under CFBs' cost-cutting policy, NPD teams generally are not given exclusive equipment to develop new products or to run tests, so that they have to negotiate with other to access to the equipment needed for developing new product. However, other departments (e.g. production department) often are reluctant to let out their equipment because they are more interested in fulfilling their own performance targets. As a result of competition for scarce resources, the efficiency of NPD projects often suffers

(e.g. causing delays). In addition to coordination problems, CFBs' cost-cutting policies can also constrain the creativity of product designers, as their NPD teams are typically strapped for funds and resources. As a result, the teams prefer more cost-efficient incremental innovation over radical innovation, which demands more resources and often take longer to develop.

Fourth, the proposal-appraisal panel policy, commonly adopted by CFBs, is designed as a bottom-up communication channel to encourage employees to share their thoughts via written reports. NPD team members can submit proposals for new products, point out on-going problems, and propose incremental improvements to existing products to a selected committee comprising senior managers and family owners. If their proposals are accepted, they are rewarded with a small cash prize or bonus points on their individual performance appraisal.

Fifth, CFBs' operational strategies are another set of organisational attributes shown to have influential effects on their NPD teams. Consistent with previous findings (W.-w. Chu, 2009; C.-H. Yang & Kuo, 2009), like many Taiwanese manufacturers, the three CFBs investigated in this study are also shifting their core operations away from manufacturing-only value-adding activities to more innovation driven ODM and OBM operations. The mixture of OEM, ODM and OBM strategies is shown to affect how CFBs structure NPD teams and how these teams work. In terms of effects on team structure, CFB owners and R&D executives often adjust the structure of NPD project teams accordingly depends on the type of the products and their corresponding strategies (e.g. OEM or OBM products). For instance, OBM projects usually require more manpower and resources, as this type of

product is much more complicated than OEM or ODM products, which mainly involve manufacturing and some product design. In terms of the effects of operational strategies on team processes, the mixture of OEM, ODM and OBM strategies may cause conflicts of interest between different types of products. For example, the teams would prioritise ODM or OEM projects as they have stricter terms and conditions (e.g. contractual duties and deadlines for delivery) or urgency than OBM projects. As a result, OBM projects may take longer to complete than ODM or OEM products.

Finally, conservative and hierarchical organisational climate is another trait shown to affect NPD teams. In terms of conservatism, NPD personnel in CFBs are encouraged to behave in accordance with explicit rules (e.g. company policies) and implicit norms (e.g. traditional ways of doing things and practical values). In a way, they are not really allowed to deviate from these explicit and implicit rules, so they are often put off from trying radical ideas or 'unconventional ways of doing things'. In terms of the emphasis on hierarchy, CFB workers are generally very 'status conscious' and would behave in accordance to their hierarchical roles/rankings, such as addressing each other by their formal job titles and showing proper respect to superiors and senior colleagues. This implicit emphasis on hierarchical status is a key reason why the flow of communication in CFB teams is largely top-down, as junior team members often feel uncomfortable expressing their thoughts to superiors.

The effects of CFBs' key organisational attributes on NPD team structure and teamwork patterns are summarised in Table 8.3.

Table 8.3: Effects of organisational context on CFB teams

Organisational attributes	Effects on team attributes (path <i>g</i> in Figure 8.1)	Effects on team dynamics (path <i>h</i> in Figure 8.1)
Family owners' involvement	<ul style="list-style-type: none"> ● Family owners' attitudes towards the R&D operation determine how much power and resources are given to the team leaders. ● If family owners are reluctant to appoint a clearly defined team leader, there will be power struggles in R&D teams over control. 	<ul style="list-style-type: none"> ● Owner involvements in NPD projects may put pressure on team members, disrupt their work, and make them feel unease. ● Without right sort of technical competence and team management skills, owner involvement in NPD projects may undermine team effectiveness and morale.
Centralised control	<ul style="list-style-type: none"> ● Like their firm, CFB NPD teams are structured and managed in a centralised, hierarchical manner. 	<ul style="list-style-type: none"> ● Team leaders' or owners' tight control may help to keep things on track, but the concentration of power can also cause large power distance and high conformity pressure.
Company policies (e.g. MBO, cost cutting)	<ul style="list-style-type: none"> ● Under the three CFBs' MBO policy, every member in NPD teams is assigned a unique set of tasks and duties. Their individual performance is assessed against their own responsibilities. ● The three CFB's cost-cutting policy is a main reason why NPD teams are given very limited resources and budget. 	<ul style="list-style-type: none"> ● MBO policy is a key driving force behind a shared sense of responsibility and a hard-working spirit in CFB teams. ● Cost-cutting policy leads to cross-functional coordination problems and can deter risk-taking or radical development projects. ● CFBs' proposal-appraisal policy is designed to encourage bottom-up communication and creativity with rewards.
Operational strategies (e.g. OBM)	<ul style="list-style-type: none"> ● NPD teams are given different budgets for developing different types of products (e.g. OBM products require more resources than ODM product) 	<ul style="list-style-type: none"> ● There may be a conflict of interest between different types of projects, such as prioritising OEM and ODM projects over OBM projects.
Organisational climate	<ul style="list-style-type: none"> ● CFBs' conservative, hierarchical organisational climate shapes hierarchical work atmosphere in their NPD team. 	<ul style="list-style-type: none"> ● The implicit emphasis on ranking/seniority in teams seems to be attributed to top-down communication and large power distance.

8.2.4 Effects of Team-Level Attributes

Based on the findings across the three case studies, four sets of team attributes were identified to have influential effects on how NPD teams work and innovate: (1) a large age gap/age diversity, (2) limited resources, (3) hierarchical team structure, and (4) task and workloads. First, the three CFBs investigated in this study all have problems retaining young talent in their R&D departments, and as a result, there is a large age gap between older baby-boomer managers and their younger X, Y generation colleagues. The large age gap in their NPD teams is shown to undermine communication (e.g. the exchange of creative ideas) because the two generations have rather different attitudes towards ideal leadership styles, risk-taking, creativity and ways of doing things.

Second, like their firms as a whole, CFB NPD teams also place great emphasis on cost-effectiveness and efficiency. Under CFBs' constant cost-cutting measures, NPD teams are generally understaffed, have limited funds and resources, and are given a hefty workload. The pressure to deliver new products with limited resources and shortage in manpower is shown to cast constraints on innovation or on creativity. For instance, team leaders often reject subordinates' ideas or designs which are considered not cost-effective enough or not 'practical' enough (e.g. require investments on upgrading production machineries). This has led the junior members to 'self-sensor' what they say and share in teams (e.g. withholding ideas which are hard to 'sell') as doing so may help them to reduce rejection rates and thus enhance work efficiency or the superiors' perception towards them.

Third, NPD team's structural traits, such as the hierarchical structure and

stability, also affect how these teams work. The hierarchical team structure means that tasks are distributed hierarchically by the team leaders, while subordinates do not get to choose what they do. Moreover, in terms the effects of team structure stability, the unstable team structure observed in case study two is shown to cause power struggles and low cohesiveness between team members. In contrast, stable team structures observed in case study one and three seems highly beneficial for collective team efficiency as every team members knows who is doing what and they are not constantly fighting for control.

Finally, tasks and workloads given to NPD teams as another set of team-level contextual factors are also shown to affect how they work and innovate. In terms of tasks, many interviewees, especially the young X, Y generation workers, found complex tasks inspiring as they enjoy the sense of achievement and individual growth after resolving difficulties or problems (interview records #0101, #0105, #0110, #0111, #0201, #0204, #0208, #0209, #0302, #0305). Conversely, even though NPD tasks could be intellectually stimulating, team members are not allowed to spend too much time and effort (e.g. doing extensive research or conducting experiments) on each task or the task which intrigue them. This is because as CFBs are constantly cutting cost, their NPD teams are left with hefty workload and shortage in manpower do that they have to be practical and efficient when dealing NPD projects in order to get things done. The adaptation to hefty workloads combined with the pursuit of practicability and efficiency may lead to missed opportunities and inhibition of creativity given that team members often do not have the luxury to elaborate on interesting/creative ideas as they have many things at hand to deal with.

The effects of these four sets of team-level attributes are summarised in Table 8.4.

Table 8.4: Effects of team-level context on the team processes

Team attributes	Effects on team dynamics (path <i>i</i> in Figure 8.1)
A large age gap between team members	<ul style="list-style-type: none"> • The large age gap commonly observed in NPD teams may undermine communication, as older baby-boomers and younger X, Y generation workers have rather different attitudes towards risk, creativity and ways of doing things.
Limited resources	<ul style="list-style-type: none"> • NPD teams generally are given very limited funds and resources, as their firms are always cutting costs. The constant pursuit of cost-effectiveness can place considerable constraints on the designs of new products.
Team structure: hierarchy and stability	<ul style="list-style-type: none"> • NPD teams in general are structured hierarchically, and this has contributed to a top-down teamwork pattern and a hierarchical work climate. • Unstable team structure can lead to power struggles and low cohesiveness in teams.
Tasks and workloads	<ul style="list-style-type: none"> • Complexity of the tasks may inspire creativity and encourage active learning. • All three NPD teams have to deal with hefty workloads and this may undermine team members' creativity.

8.3 Contextual Inhibitors and Facilitators of

Creativity/Innovation in CFB NPD Teams

As explained in the previous section, CFB NPD teams' work context can have complex effects on how they work and innovate. This section will provide a multiple level review into the effects of contextual factors from the perspective of how they affect creativity or innovation. In many ways, CFB

teams may not be ideal incubators for radical innovation as they deliver mainly incremental and copycat innovation, while original, radical new products are rare (interview records: #0103, #0110, #0201, #0202, #0302, #0305). For instance, one of Company K's R&D personnel stated:

'We do have radical new products – they are very rare' (interview record: #0103).

Whereas one of Company G's R&D personnel explained:

'Before, we only have incremental innovation or copycat products imitating Japanese vending machines, but now we have managed to develop one original, radical new product. Although this radical new product took several years to develop, we are planning to make more products like this one' (interview record: #0201).

One of Company F's team members also stated:

'Most of our products are copycat innovation. We just copy and manufacture other people's products. We don't really do radical new products, they are very rare. We mostly copy' (interview record: #0302).

The reasons why NPD teams mainly develop incremental innovation can be rather complex. One of the causes of the low ratio of radical innovation is the contextual limitations faced by R&D personnel. In many ways, CFB NPD teams are not ideal incubators for innovation given constraints imposed by their work context. Team members are often unable to elaborate on novel ideas or develop radical new products as they are not allowed to do so by superiors, or due to a lack of adequate resources to materialise their ideas into new products. Having said so, it does not mean that they are forbidden to be creative or to use their novel ideas once for all.

They just have to learn to work around these restrictions and make the best of what they have at hand to deliver new products. Even though their work context may constrain how creative they can be, or how creative they are allowed to be, not all aspects of their work contexts have the inhibiting effects. In fact, some contextual may help to facilitate or inspire creativity, while some may function like a double-edged sword, as they may inhibit or facilitate creativity/innovation under different circumstances. Table 8.5 provides a multilevel summary of the inhibitors and facilitators of creativity/innovation observed in CFB NPD teams.

Table 8.5: Inhibitors and facilitators of creativity/innovation in CFB R&D teams

CFB teams' Context	Factors that inhibit creativity/innovation, or obstruct the exchange of creative ideas	Factors which may facilitate creativity/innovation, or the exchange of creative ideas
Sociocultural norms	<ul style="list-style-type: none"> • Values related to social hierarchy • Concern for interpersonal harmony 	<ul style="list-style-type: none"> • Diligence and a shared sense of responsibility
Industry-related factors	<ul style="list-style-type: none"> • Buyers' bargaining power • Stress to cope with client demands • Industrial/trade regulation 	<ul style="list-style-type: none"> • Collaboration with strategic alliances • Market fluctuation & competition
Organizational attributes	<ul style="list-style-type: none"> • Hierarchical work climate • Pursuit of cost-effectiveness and efficiency • Pragmatic values • MBO policy 	<ul style="list-style-type: none"> • Proposal-appraisal panel policy • MBO policy
Team level context	<ul style="list-style-type: none"> • Authoritarian leadership style & hierarchal teamwork pattern • Age-gap/generation-gap between team members • Conformity pressure 	<ul style="list-style-type: none"> • Autonomy • Training and learning

8.3.1 Sociocultural-Level Inhibitors and Facilitators of

Creativity/Innovation

As explained in the previous section, sociocultural norms related to social hierarchy, interpersonal harmony and diligence have influential effects on how NPD team members work, interact and communicate. These three sets of sociocultural norms seem to have different effects on creativity/innovation in CFB teams. Cultural norms related to social hierarchy and interpersonal harmony were shown as indirect inhibitors of creativity/innovation because the pressure to conform to these two sets of cultural norms may obstruct open communication. For instance, junior workers are under implicit social pressure to act in accordance with their roles, so that instead of saying what they really think, they would carefully construct what they say to their superiors or colleagues to prevent antagonising the bosses. Therefore, they are more likely to elaborate on superiors' ideas rather than taking the initiative, or they are more likely to conform or compromise rather than dissent for the sake of managing seemingly harmonious work relationships. For instance, one interviewee said:

'We have to show consideration for other people's feelings and face, because we have to work together in the future. I try to maintain a good relationship with them because good relationships can be beneficial for working with them in the long-run. If you antagonise them, it will be difficult to work with them again. Some people are like that. ... So I would be careful what I say and who I speak to, if I worry that my ideas may offend them, I keep my ideas to myself and say nothing' (interview record: #0302).

Another example is that under the 'mighty is right' value, ideas or proposals are often assessed based on the credentials and/or status of the speaker rather than on a thorough, multi-angle assessment of what was said. Comparative speaking, senior managers have a better chance to materialise their creative ideas into actions or innovation than their junior colleagues, as they have the aid of more power, resources or credentials. This inequity can be frustrating for junior workers, as they may not receive adequate recognition or rewards for their efforts and ideas due to their low status and inexperience. As a result of their frustration and the biased assessments, junior team members are often put off expressing creative ideas, so the team as a whole may not be able to make the best of their creativity.

Even though the pressure to conform to norms related to social hierarchy and interpersonal harmony may deter NPD personnel from expressing creative ideas, cultural values related to diligence may help to offset this effect to a certain extent. Under the influence of the cultural value of diligence, CFBs workers generally have a strong sense of responsibility and work diligently to fulfil their duties. Therefore, they often feel that they are 'obliged' to share candidly and dissents, indicate problems, propose novel designs and techniques, and incorporate creative ideas as much as they can into their designs (interview record: #0104, #0105, #0106, #0110, #0202, #0203, #0205, #0206, #0209, #0301, #0302). Clearly, societal value related to diligence and a shared sense of responsibility can function like a facilitator to encourage more adoption of innovation and less inhibited communication of creative ideas.

8.3.2 Industrial-level Facilitators and Inhibitors of

Creativity/Innovation

As explained earlier, the findings indicated that three sets of manufacturing industry-related factors can have complex effects on product innovation. On the one hand, buyers' bargaining power, stress while cooperating with clients, and legal/industrial regulations were found to have inhibiting effects on creativity or innovation in CFB NPD teams. Given that manufacturing is a largely buyers' market and it has high levels of vertical integration, dealing with clients can be a stressful business. Manufacturers must respond quickly and efficiently to client demands for the sake of customer satisfaction and attracting orders. As a result, CFB R&D personnel are often distracted from focusing on developing products and being creative as they must attend to clients' requests first. The collaboration with clients can have another inhibiting effect – client's negative remarks can put the teams off trying radical new ideas, or the team may have to spend more time and resourced to alter or redo designs. Moreover, in comparison to these more 'dynamic' inhibitors, industrial/legal regulations, as another manufacturing industry-related inhibitor, have more of 'static' effects. NPD teams have to take industrial/legal regulations into account when developing new products and eliminate designs which fail to satisfy these regulations.

On the other hand, although these industry-related factors may constrain product innovation in CFBs, there are other factors which have facilitating effects. First, the collaboration with strategic alliances can function like a double-edged sword. On the one hand, as explained, working with clients throughout the development of new products can be stressful and may put

the team off trying certain designs. On the other hand, the interactions with clients and other external parties (e.g. research institutes) can also be inspiring and intellectually stimulating as team members are exposed to different viewpoints and new technologies, theories or competences (interview records: #0101, #0103, #0105, #0106, #0109, #0210, #0304, #0305). For instance, two interviewees noted that interacting with clients and suppliers can help them obtain valuable trade information, which may in turn inspire new designs:

'We have to keep in touch with the key players in our industry. Basically, we and managers from our strategic alliances travel together all the time, such as attending the same tradeshow. So, we know each other well and we share information and keep in touch. This is important for us to promote our products and to understand what clients really want' (interview record: #0106).

'I talk to clients or suppliers when they visit our company. We can share ideas and talk about products, trends or things related to our work. I can learn a lot from them. Besides industrial partners, we also work with research institutes like the Academic Sinica such as attending their seminars. This is also a source of valuable technical information' (interview record: #0210).

Second, market fluctuation and competitions are another set of industry-related facilitators of innovation in CFB NPD teams. As explained previously, it is typical for CFB managers and owners to monitor market situations and adjust their plans and decisions accordingly. For example, in order to keep up with the competition, they often buy competitors' products and then carry out copycat innovation or incremental upgrades to existing products based on their inspection (interview records: #0103, #0106, #0109, #0201, #0202, #0203, #0301). Three interviewees explained:

'We keep a watchful eye on the market. First, it is crucial for understanding client demand. Second, we also have to collect our competitors' products. We have to know what our competitors are doing and what our clients want from them or from us. ... After all, we suppliers and our clients are interdependent and we can't survive without one another' (interview record: #0109)

'We pay attention to new vending machines available in the Japanese market. ... We regularly analyse their new products and decide whether we should push for similar products. Otherwise, we cannot compete with Japanese competitors. If we do not make similar products, we will not be able to keep up with the competition with our Japanese competitors. Our clients may think that we are unable to innovate if we do not catch up with new Japanese machines, so we may lose business' (interview record: #0203).

'Most of our products are copycat innovation. We copy our competitors' products, or we improve them. We will observe what's new in the market and we try to copy or integrate their new designs into our old products' (interview record: #0202)

Besides promoting copycat innovation, market fluctuation and competition may also inspire other creative ideas. For instance, the ever-increasing commodity prices are important driving forces behind the attempts to find cheap alternatives to replace increasingly expensive raw materials such as rubber and copper (interview records: #0101, #0105, #0108).

8.3.3 Organisation-Level Inhibitors and Facilitators of

Creativity/Innovation

As explained, CFBs' organisational attributes can have complex effects on how NPD teams work and innovate. Based on what was found across the three case studies, organisational traits such as hierarchical work climate,

pursuit of cost-effectiveness and efficiency, pragmatic values and an MBO policy were found to have inhibiting effects on how NPD teams carry out product innovation. First, CFBs' conservative, hierarchical organisational climate has led to high power distance and high conformity pressure, which in turn, inhibit open communication and risk-taking in their NPD teams. For instance, one interviewee said that their firm does not allow individuals to take new initiatives or to try radical new approaches that deviate from the existing ways of doing things (interview record: #0205). He stated:

'Our company is a bit like a rigid spoon-feed/rote-learning education system which gives you a question and a specific answer. You are not allowed to answer the question in other ways' (interview record: #0205).

Several interviewees also pointed out that if they want to use their own ideas and defy the pressure to conform to conventional approaches, they have to produce 'solid evidence' (e.g. laboratory test results) to prove that their ideas are better than their superiors' ideas or the conventional approaches (interview records: #0103, #0105, #0107, #0109, #0204, #0207, #0302, #0305). One of them explained:

'If I think my superiors' or the old approach probably won't work, I still use their approach. I need the evidence, like test results, to prove that their approach does not work. They won't listen unless I show them the evidence. It's troublesome, but this is how things are' (interview record: 0204).

Second, the active pursuit of cost-effectiveness and efficiency is another organisational trait shown to constrain product innovation. Comparatively

speaking, this emphasis is probably the most powerful organisational-level inhibitor of creativity/innovation in CFB teams, mainly because this policy severely restricts resources and manpower given to NPD teams. As CFBs generally are reluctant to invest great sums in product innovation, their NPD teams often prefer cheaper and more practical incremental innovation because radical new products are often considered unaffordable and too risky (interview records: #0101, #0103, #0202, #0203, #0204, #0209, #0302, #0305). For instance, one of Company K's managers pointed out that radical new products have 'high potential, but they also come with potentially higher costs', and thus they can only try when 'Company K's scale is large enough to support such costly projects' (interview record: #0101). In addition, one of Company G's managers also stated:

'We have to deliver products efficiently, so we do not have the spare resources or funding to try radical ideas... We simply cannot allow our team members to do radical new products or to try radical new ideas because we cannot afford it. It's probably only possible in the high-tech industries' (interview record: # 0204).

Another consequence of the cost-cutting policy is that CFB teams generally are understaffed, as their firms try to cut down on overheads. Consequently, NPD personnel have to cope with a hefty workload to make up the shortage in manpower. As they struggle to cope, they often do not have sufficient mental capacity to focus fully on product design or on trying out creative ideas because they are preoccupied with getting things done first (interview records: #0107, #0109, #0110, #0203, #0205, #0209, #0302). For instance, two interviewees explained:

'We do not have the resource or manpower for developing radical new products. Our managers prefer copycat innovation because it is very difficult for us to do radical innovation. For example, we do not have the manpower to do extensive market research, which would be essential for identifying potential customer demand when developing original, radical new products' (interview record: #0302).

'Although we are an R&D department, personally I think our department should be called a development department, since we only do development and there is no research. We young R&D personnel want to develop radical products which are completely different from what's available in the market. But we, including our bosses, all know that we do not have the time to do it. We are simply struggling to cope with existing cases and do not have the luxury to think about radical new products. ... We have been seriously understaffed for a long time' (interview record: #0110).

Third, CFBs' pragmatic value is another organisational attribute shown to restrict product innovation. Consistent with previous findings, I also found that CFBs are rather pragmatic entities (Elkin, Cone, & Liao, 2009; Wah, 2001), given that the firms investigated in this study all adopt a very rational approach towards product innovation. For these firms' R&D personnel, innovating is not about letting creativity roam free and developing something completely new. Instead, it is about how to use what they already have (e.g. know-how, existing equipment) effectively to create something new and useful. For instance, R&D personnel rely heavily on the experience of developing existing products because they use such experience and know-how as the "foundation" to formulate new products/designs (interview records: #0101, #0105, #0202, #0203, #0210 #0301, #0304, #0305). Besides utilising knowledge and know-how as much as they can, these firms also try to maximise the usage of existing production facilities. Therefore,

R&D personnel must take the capacity of their existing facilities (e.g. how much they can produce per month, the levels of sophistication with which their machines can cope) into consideration when designing new products (interview records: #0101, #0103, #0105, #0106, #0110, #0201, #0202, #0204, #0207, #0209, #0304, #0305). Designs that cannot be manufactured or take a long time to manufacture by using existing equipment are normally considered impractical and are thus eliminated. For example, two interviewees explained:

'When we draw-up blueprints or designs, we also have to think about whether our existing production department can manufacture such designs. If they cannot produce the new designs, then these designs are useless. We have to think about everything involved, such as models, the supply of components and raw materials, like whether it would be easy to buy these components' (interview records: #0207).

'We have to consider the limitations of our production machinery. This is when experience comes into play. If you know the production capacity of our factories and the limitations of the equipment, it will help to come up with feasible designs. If you do not understand, you will waste a lot of time on developing designs which our factories simply are unable to produce' (interview record: #0209).

Although such a 'make the best of what we already have' approach is very practical, it may discourage R&D personnel from trying radical innovation that requires major investment in production equipment or acquiring key technology (interview record: #0206). As a result, they may miss opportunities to turn creative ideas into cutting-edge new products.

Fourth, the MBO policy is another organisation-level factor shown to impose constraints on NPD teams. Under the MBO policy, NPD personnel are

not allowed to make too many mistakes, as they can be costly and time-consuming to fix. For instance, two interviewees stated:

'We will tolerate one mistake but we not second or third mistakes' (interview record: #0106).

'... nowadays our bosses do not allow too many failures given the pressure to be efficient. We now deal with a lot of cases so we have to be more efficient and therefore cannot afford too many mistakes' (interview record: #0110).

Given the low tolerance for error, R&D personnel are often reluctant to try radical ideas or new techniques as they may take longer, cost more, or have higher risks of failure. They are likely to be penalised (e.g. having points deducted from their individual performance appraisal for failing to deliver their tasks or designs swiftly and efficiently. For instance, one interviewee explained:

'It's normal to get the blame if I am unable to deliver good results, such as unable to complete a new design or something like that. I may lose my job but I think it's perfectly sensible. Nowadays, our company is moving towards performance-oriented management. So, it is not like in the old days when you get life employment and do not have to worry about failure because you will only get a slap on the wrist. Therefore, under such a performance-oriented policy, I feel unsafe or insecure when I am unable to deliver new products for which I am responsible. I have to take the responsibility' (interview record: #0205).

Besides deterring R&D personnel from trying risky or radical ideas, these firms' MBO policies also lead to cross-functional coordination problems between the R&D department and other departments (e.g. production and

sales department). Under MBO, everyone is self-interested in prioritising their own performance targets and therefore would compete for scarce resources. This has led to delays, disputes and frustrations among young R&D personnel who lack bargaining power due to their low status (interview records: #0107, #0109, #0110, #0203, #0204, #0205, #0206, #0207, #0209, #0210, #0301, #0302, #0304, #0305).

Even though the MBO policy may seem to have an inhibiting effect on creativity/innovation, it may also have facilitating effects as well. Under its influence, NPD personnel generally think that it is their responsibility as a 'designer' to share their creative ideas with fellow teammates and incorporate creative ideas into these designs (interview records: #0105, #0109, #0110, #0202, #0204, #0209, #0301, #0305).

In addition to the MBO policy, another organisational-level facilitator of creativity/innovation is the proposal-appraisal panel. As explained, CFBs commonly adopt this policy to encourage bottom-up communication through a monthly competition between written proposals/reports. For instance, one interviewee pointed out:

'In our department, there are two ways to share creative ideas. First, our company has a proposal-appraisal system. Our R&D personnel can propose their ideas through this proposal-appraisal system. Second, they can also apply creativity to their work. We want them to actively share their ideas because it would be great. Especially the youngsters, they can try to be as creative as they can and let their creativity roam free. I would be happy if we could get several good ideas out of 100 proposals. We would give a cash prize for useful proposals or reward them depending on the results of their proposal' (interview record: #0106).

To some extent, this proposal-appraisal panel helps to compensate for the negative effects of CFBs' conservative, hierarchical work climate, which often puts off employees expressing thoughts. This policy seems to create a win-win situation for both R&D managers and junior workers. On the one hand, with a few hours and a small amount of money spent on marking and rewarding reports, senior managers can get to know the voices of their low-rank workers or learn about any ongoing problems which they are not aware of (interview records: #0101, #0106, #0206, #0302). On the other hand, junior R&D personnel can voice their thoughts by writing them into reports and submit them to the proposal-appraisal system. They may win cash rewards and bonus appraisal points if their proposals are accepted (interview records: #0101, #0106, #0107, #0110, #0204, #0301, #0302).

8.3.4 Team-Level Inhibitors and Facilitators of Creativity/Innovation

I have identified three team level inhibitors: the large age gap/age diversity between team members, top-down teamwork patterns, and conformity pressure, based on the findings across the three NPD teams. These team-level inhibitors can have interrelated effects. As explained, most of the three CFB NPD managers are baby-boomers, while their subordinates are mostly X, Y generation. The two generations seem to prefer different leadership styles and have different attitudes towards creativity/innovation. In terms of leadership, many of the older baby-boomer managers adopt the traditional authoritarian, paternalistic style of leadership, which is characterised by centralised control, emphasis on hierarchical status, and intuitive decision-making. This approach, combined with hierarchal work arrangements, has led to large power distance, top-down communication,

and high conformity pressure. Most of the younger X, Y generation R&D personnel dislike such traditional authoritarian leadership approach because they prefer a more systematic, competence-oriented management approach and an egalitarian work climate. Nevertheless, they still conform to their superiors' authoritarian demands and accept the hierarchical work arrangements without voicing dissents in order to survive and fit in (interview records: #0107, #0110, #0111, #0201, #0205, #0206, #0207, #0209, #0301, #0302 #0305). As leaders behave like autocrats while subordinates act like a bunch of compliant 'yes-men', the team as a whole is unlikely to make efficient use of its members' ideas and knowledge because communication is marred by authoritarian control and conformity pressure. For instance, two interviewees pointed out that their superiors generally dislike subordinates dissenting:

'If we disagree with the bosses, we have to back off and conform to the superiors. It's frustrating because they just don't allow us to make decisions or contribute our ideas. But maybe they just want to get things done in one go and therefore they want us to use their approach. Fine, I will just do what they want me to do and say nothing' (interview record: #0209).

'If I disagree with my superior, I will just conform to his ideas and use his approach. I may try to reason with him, but they often do not listen. They have higher status and therefore would insist on their own ideas. If they do not listen to us, or if they do not like our designs, we just have to change the designs. We are powerless' (interview record: #0305).

In addition to different preferences towards leadership style, the two generations also seem to have rather different attitudes towards creativity and innovation. Comparatively speaking, older baby-boomer workers are

largely more conservative and can be reluctant to take risks and to accept new ideas from junior team members. In contrast, the junior team members are more eager to try new ideas and incorporate new technology, as they are more open to novelty and technical advances as well as risk-taking (interview records: #0104, #0110, #0201, #0206, #0302, #0305). For instance, two X, Y generation interviewees noted:

'The older generation managers can be reluctant to accept changes or new ideas because they think that if the existing approaches still work, why change at all? But we youngsters believe that new approaches can work better, so why not change the way we do things?' (interview record: #0110).

'Some of our colleagues have 20, 30 years of tenure, so they often do not accept us junior workers' suggestions or ideas. ... They just won't listen to us. They think very differently, so there is a generation gap' (interview record: #0302).

If senior managers have narrow-minded attitudes towards radical new ideas or approaches, junior team members generally do not dare to deviate from their superiors' preference and take the initiative because they do not want to antagonise their bosses (interview records: #0110, #0201, #0302, #0305). As a result, teams as a whole may miss out on some great ideas because junior team members are discouraged from sharing ideas or trying new ways of doing things.

Moreover, even though these team level contextual factors may inhibit creativity or obstruct the exchange of creative ideas in CFB teams, there are two team contextual factors which may help to foster creativity: autonomy and training and learning. In terms of autonomy, all R&D personnel in CFBs are given considerable autonomy, freedom, or a 'stage' to encourage them

to apply creativity to their tasks (interview records: #0104, #0106, #0201, #0301, #0304). As long as the junior team members are able to deliver satisfactory results or designs, their R&D managers generally would not intervene in how they develop the designs (interview records: #0104, #0110, #0201, #0202, #0209, #0210, #0301, #0302, #0303, #0304, #0305). Besides autonomy, training and learning are also said to be highly beneficial for facilitating innovation — as they may help to stimulate individual growth, inspire creativity, improve their work efficiency, and speed up design process (interview records: #0103, #0105, #0110, #0204, #0205, #0209, #0304, #0305). CFB R&D personnel are generally rather keen on learning new things and would try to apply what they learn on their designs (interview records: #0103, #0104, #0105, #0110, #0202, #0205, #0206, #0207, #0209, #0210). For instance, one interviewee pointed out:

‘When I go home, I still spend a lot of time reading new things, take notes and do my homework. It has become a lifestyle. Yah, I have quite a few notebooks which I find quite useful. Such learning spirit is good for me and for the firm as a whole’ (interview record: #0103).

Based on this multilevel review into the inhibitors and facilitators of creativity, it seems that CFB teams may not be ideal incubators for innovation, particularly considering the various constraints imposed by different aspects of their work context. Nevertheless, there are also contextual factors which may help to offset these inhibiting effects by encouraging less inhibited communication and by promoting creativity.

8.4 Key Divergence: Owner Involvement and Training

Even though the teamwork patterns found across the three CFBs are rather similar, there are also many differences found, such as different types of products, team structures, job designs, owner involvement, and on-the-job training. Of these differences, owner involvement and on-the-job training were found to have the most noticeable effects on the effectiveness and morale of NPD teams.

8.4.1 Owner Involvement: Hands-on or Hire Professional Managers

Even though all the owners of the three CFBs investigated in this study have centralised control over their family firms, not all of them are interested in controlling NPD projects or the R&D departments by themselves. I observed two different approaches adopted by the owners: (1) a hands-on approach used by the owners of company G in case study two, and (2) a 'let the professionals do it' approach used by owners of company K in case study one and company F in case study three.

In terms of the hands-on approach, company G's owners in case study two are reluctant to relax their grip on power by appointing professional managers as NPD team leaders or by allowing them to make strategic R&D decisions. Therefore, they have opted for a hands-on approach towards NPD projects. Even though they do not have the right sort of competences, they still choose to manage NPD projects by themselves. As authoritarian team leaders, they dictate key strategic decisions, set goals and targets, arbitrate disputes, and constantly monitor progress of NPD projects. Yet, their close involvement, combined with an authoritarian leadership style, constant

interference, and inconsistent instructions are shown to undermine the efficiency of NPD projects and team morale, and thus contribute to the firm's long-term loss-making performance (interview records: #0201, #0202, #0205, #0206, #0209). For instance, one of Company G's R&D personnel stated that the owners' ambiguous instructions and many policy U-turns were to blame for the team's five-year struggle to complete their one and only radical new product:

'The key reason why this original product took so long is that the owners did not have clearly defined goals and plans. They don't know what they want so they change their minds all the time. Today they want this, but tomorrow they may want to add something else. No wonder it has taken more than five years, but it cannot be helped. It's just like an endless nightmare because we don't know when we can have closure' (interview record: #0202).

In contrast to this hands-on approach adopted by the owners of Company G, the other two owner families acknowledge that they do not have the right sorts of skills needed for managing complex NPD projects, and thus have employed professional R&D managers. They also empower these professional managers to make strategic decisions. This is in sharp contrast with company G's owners, who are reluctant to relax their grip on power by allowing non-family executives to participate in the making of strategic decisions. Even though Company K and Company F's owners do not participate in the running of NPD projects, they still keep a close eye on overall progress and give support where necessary (e.g. investing in updated equipment and hiring technicians). They do not interfere in how their R&D executives manage NPD projects unless absolutely necessary.

Their trust and support towards professional managers is indispensable for the success of their R&D teams, as it allows the managers to do what is necessary for the firms, without having to worry about owners meddling in NPD projects (interview records: #0103, #0304, #0305).

By comparing these examples, it is clear that when the owners do not have the right sort of competence and team management skills to run NPD projects by themselves, the 'let the professionals do it' approach works better than the hands-on, dictatorial approach. The two firms where the owners have hired and empowered professional managers are making profits and expanding progressively, while their R&D personnel are largely content their work. In contrast, the firm where owners adopt a hands-on, dictatorial approach is a long-term loss-making company and its NPD team suffers from low morale and high staff turnover. The key differences between the family owners' attitude, their involvement in NPD projects and R&D personnel are summarised in Table 8.6.

Table 8.6: A comparison of family owner involvement in R&D operation across the three cases

	<u>Case study one</u> <u>Company K</u>	<u>Case study two</u> <u>Company G</u>	<u>Case study three</u> <u>Company F</u>
Family owners' role	As top executives	As top-executives	As top-executives
Family owners' control	Centralised control	Centralised control	Centralised control
Level of ownership concentration	Low	Medium	High
Composition of top management team	A mixture of family and non-family executives	Family-members-only executive team	A mixture of family and non-family executives
Owners' attitude towards R&D operation	R&D is important so they hire and entrust professional managers to run R&D operation.	They want to reinforce family's control by dictating all R&D decisions.	R&D is important so they hire and entrust professional managers to run R&D operation.
Owners' technical competence	Little/inadequate	Little/inadequate	Little/inadequate
Involvement in the development of new products	No, but they would monitor results of NPD projects.	Yes, as the authoritarian team bosses, who dictate key R&D decision.	No, but they would monitor the results of NPD projects.
A competent team leader	Yes	No	Yes
Can R&D managers make key decisions	Yes	No	Yes
Owners' willingness to invest in R&D	Yes	Limited/reluctant	Yes
Effectiveness of NPD projects	Good	Poor	Good
R&D team morale	Good	Poor	Good
Profitability of the firm	Profitable	Long-term loss-making	Profitable

8.4.2 Differences in On-The-Job Training

Besides owner involvement, different training approaches found across the three family firms are also shown to have noticeable effects on team morale and effectiveness. Even though almost all of the interviewees agree that on-the-job training and learning are vital for them as R&D personnel, not all the family firms are willing to provide comprehensive training. Across the three family firms investigated in this study, only the large family firm in case study one provides its R&D personnel with systematic, continual on-the-job training. In contrast, the two smaller family firms only offer a brief induction and some supervisor-subordinate mentoring through problem-solving scenarios. The details of the different on-the-job training practices found across the three case studies are summarised in Table 8.7.

As shown in Table 8.7, Company K offers much more comprehensive on-the-job training such as weekly seminars, an in-house library, regular job rotation and training camps, which are not provided by the other two family firms. This systematic, continual approach was introduced by a new R&D executive, who regards people as 'the most important asset of the firm' (interview records: #0101). By providing R&D personnel with a wide range of training activities and opportunities to deal with different tasks, Company K's managers hope to groom their young talent to become competent 'next-generation managers' and retain them in the firm on a long-term basis (interview records: #0101, #0103, #0104, #0105, #0106, #0110). For instance, one senior manager stated:

'I encourage my subordinates to share things that they have learned. So far, we have a weekly seminar in which everyone is

encouraged to share what they have learned. ... This seminar is great for boosting our engineers' sense of achievement. These youngsters are generally keen on learning. ... As a result (of training), we now have lower turnover and we seem able to retain young talent' (interview record: #0104).

Table 8.7: A comparison of different training approaches across three family firms

	<u>Case study one</u> <u>Company K</u>	<u>Case study two</u> <u>Company F</u>	<u>Case study three</u> <u>Company G</u>
Company size	Large	Medium	Medium
Operational scope	Multinational	Taiwan	Taiwan and China
Induction session	Yes	Yes	Yes
Systematic, continual on-the-job training (e.g. weekly seminars)	Yes	No	No
In-house library	Yes	No	No
Archives of NPD projects	Yes	Yes	Yes
Leader-subordinate Mentoring	Yes	Yes	Yes
Regular job rotation	Yes	No	No
Opportunities to learn different skills	Yes	No	No
Encourage diverse skills or one core expertise	Encourage diverse skills/multiple expertise	Encourage one core expertise	Encourage one core expertise
Focus on research or on development	Mainly development + some research	Development only, no research	Development only, no research
Team members' learning needs	Largely satisfied	Deprived	Deprived
Young workers' turnover	Low	High	High

These systematic training practices not only help to educate and motivate junior team members by satisfying their learning needs, they are also shown to improve work efficiency, boost team morale, and encourage team members to share and exchange technical expertise and creative ideas (interview records: #0101, #0103, #0104, #0105, #0106, , #0108, #0109, #0110).

In contrast with the systematic continual on-the-job training observed in case study one, R&D personnel in the two smaller CFBs in case studies two and three are deprived of this support, despite they also have strong training needs (interview records: #0206, #0209, #0302, #0304). For instance, many of their junior team members argued that the one-off induction and some leader-subordinate mentoring are grossly inadequate as they still have to ask around for advice, search for information online, and learning by doing to get on with their job (interview records #0205, #0206, #0209, #0301 #0302, #0305). Besides the lack of training, Company F and Company G's R&D personnel are all assigned similar or repetitive tasks because their firms encourage them to stick to one specific area and become the only expert in this capacity. The lack of training, combined with repetitive tasks, can be demoralising for young R&D personnel, who are eager to learn different skills. This may account for the high staff turnover in these firms because their young talent often choose to leave the firm due to the lack of training opportunities (interview records: #0205, #0206, #0209, #0302). For instance, one of Company F's junior interviewees explained:

'I have learned quite a bit since I joined this firm. But I may not stay, because I have been doing similar tasks all the time. They are all the same and there is nothing new to learn. For us youngsters, we

only come here to learn. I think that I have learned enough here. I would like get out and learn something else outside' (interview record: #0302).

Moreover, the lack of training in these firms may also restrict individual growth or inhibit creativity. For example, two of Company G's R&D personnel noted:

'We need education and training. Personally, I think education and training is very important for doing innovation. If we don't go out to attend tradeshows to see new things, we will not have the external stimulus to inspire new designs or creative ideas. So, if we want to innovate, we should invest in education and training. ... We really need such external stimulus because it can save us a lot of time on developing new products or they help us to catch up new trends' (interview record: #0209).

'When I first came in, I felt that I was learning a lot. But after six months, I feel stuck because there is no opportunity to apply what I've learned. Now I am doing repetitive tasks all the time and I feel that I have become dumber. Now I just feel indolent' (interview record: #0206).

Clearly, the different levels of on-the-job training can have influential effects on the personal growth, morale and turnover intention of young R&D workers in CFBs.

8.5 Chapter Summary

In this chapter, I have reviewed the key findings by comparing the common themes and key divergences found across the three case studies. First, in terms of teamwork patterns, all three CFB R&D teams are managed in a centralised, hierarchical manner in which leader-subordinate

interactions are similar to relationships between authoritarian mentors and their obedient apprentices. As authoritarian mentors, CFB managers have concentrated power to make decisions and plans. Under the tight control of these authoritarian managers, their subordinates generally play the role of obedient apprentices who carry out top-down assignments diligently as a gesture of respect and would try to learn as much as they can while working with superiors and colleagues. Besides the top-down team work pattern, all the NPD teams also place considerable emphasis on cost-effectiveness, efficiency, pragmatism, responsibility, hierarchical status and superficial interpersonal harmony. As a result, it is typical for CFB NPD personnel to work diligently and efficiently, be very cost-conscious, and manage harmonious work relationships with all relevant parties for the sake of smooth long-term collaboration. These teamwork patterns seem to be functional given that, via this approach, all three CFB R&D teams are largely able to deliver new products swiftly and efficiently (interview record: #0101, #0106, #0201, #0305). However, this teamwork approach is not without its problems. High conformity pressure, an authoritarian leadership approach, and hierarchical work arrangements are shown to inhibit creativity, undermine communication, and lead to low morale and high staff turnover in CFB teams.

Moreover, the findings also reveal the complex effects of context on CFBs and their teams. The second part of the chapter discusses how the four aspects of team context – sociocultural norms, manufacturing industry-related factors, CFBs' key organisational traits, and key characteristics of teams – affect the way CFB teams work and innovate. As illustrated in the empirical framework in Figure 8.1, these four aspects have

interrelated effects on teamwork patterns observed in CFBs. Moreover, the subsequent third part of the chapter examines how these contextual factors affect creativity/innovation in CFB NPD teams. In many ways, NPD teams in CFBs may not be an ideal incubator for innovation given many contextual inhibitors imposed by their work context. For example, in compliance with CFBs' corporate policies, NPD team members have to prioritise practicability, cost-effectiveness and pragmatism over novelty/originality when it comes to product design. Table 8.4 summarises the contextual inhibitors and facilitators of creativity/innovation found in CFB teams.

Finally, in addition to the common teamwork patterns and complex effects of CFB team context, I have also reviewed the two key divergences found across the three case studies: owner involvement and on-the-job training. In terms of owner involvement, the results indicate that not all the family owners are keen to manage NPD projects for the sake of reinforcing control. Without the right sort of technical competence and team management skills, owner involvements and their desire to reinforce were found to undermine team effectiveness and morale. In terms of training, the results reveal that the lack of training in small and medium CFBs contributes to high turnover and low morale among young R&D workers. In contrast, continual, comprehensive on-the-job training programme provided by the large family firm in case study one have positive effects on team effectiveness and morale. The implications and limitations of these findings will be elaborated in the next chapter.

Chapter 9 Discussion and Conclusion

9.0 Introduction

This research set out to explore teamworking in the context of CFBs from an indigenous psychology perspective. Specifically, it addressed two key issues: (a) to explore how CFB teams use teamwork to carry out product innovation, and (b) to investigate how these teams' contexts affect how they work and how they carry out product innovation. In this chapter, I will discuss the implications and limitations of the findings. The first part of the chapter reviews the theoretical implications of the findings to CFB and Chinese management literature as well to the mainstream team literature. The second part proposes possible practical implications and advice to practitioners regarding managing NPD teams in CFBs. The third part of the chapter reflects on the limitations of this study and maps out some directions for future research. Finally, this chapter draws the study to a close with a brief conclusion.

9.1 Theoretical Implications of the Findings

9.1.1 Implications for CFB and Chinese Management Literature

As little is known about how teams work and innovate in Chinese organisations (Phan et al., 2010), the findings within this research may add to the CFB literature or the Chinese management literature by providing in-depth exploration of team dynamics and team innovation in Chinese

family firms. Broadly speaking, the way CFB teams are managed is not much different from how CFBs are governed as a whole, given that centralised and hierarchical control accompanied by compliant followership behaviours is typical in CFBs (B.-S. Cheng, 1993; Farh, 1995; Redding, 1996). The findings suggest that this 'traditional' hierarchical work pattern can impose high conformity pressure and inhibit the exchange of creative ideas in teams, and lead to high turnover and low morale among young R&D workers. Consistent with previous research (H.-C. Yu & Miller, 2003, 2005), I found that Taiwan's well-educated young knowledge workers are increasingly reluctant to accept centralised authoritarian control and the emphasis on hierarchical superiority in the workplace. Even though young knowledge workers would conform to these 'traditional practices' in order to fit in and survive in the workplace, they often decide to leave the team or choose not to express their ideas or concerns as silent protests against their leaders' authoritarian control. Despite the fact that baby-boomer managers generally are aware of this problem, only managers of a large CFB are adjusting their management practices (e.g. by placing more emphasis on competence and adopting project management practices) in an attempt to retain and motivate their young workers.

Moreover, the findings also provide more clues into how generation gap and age diversity affect creativity and the exchange of creative ideas in Chinese teams. Consistent with Yen's (1994a, 1994b) studies, I also found that high turnover among young workers is typical in CFBs, and as a result, large age diversity or a large age gap between team members is commonly observed in their NPD teams. Previously, researchers (S. Liu, 2003; H.-C. Yu & Miller, 2003, 2005) suggested that the generation gap can lead to

communication and management problems in Chinese firms, as younger and older generations have very different values and work attitudes. For instance, Chen, Hsu and Huang (2010) established that in Taiwanese high-tech/IT companies, older baby-boomer R&D executives are much more conservative and are more likely to avoid taking financial risks that 'may threaten their reputations and job security' as compared to younger X generation workers (p.329). The findings reveal that in addition to deter risk-taking, baby-boomers' conservatism and narrow-minded attitudes towards dissent, creativity, and novelty can also undermine communication, cause conflicts, and inhibit creativity in Chinese work teams. For instance, CFBs' X, Y generation workers are often put off sharing creative ideas or radical designs with their well-established baby-boomer colleagues, who can be reluctant to accept subordinates' dissent or creative ideas unless solid evidence (e.g. laboratory test results or computer simulations) is presented as support. This can be frustrating for the younger X, Y generation workers because they may not always be able to find or produce convincing proof for their ideas. Evidently, the generation gap between the baby-boomer generation and the X, Y generation can block smooth teamworking, as argued by Sirias, Karp and Brotherton (2007).

Moreover, the findings also provide fresh understanding of the effects of family ownership on the effectiveness of NPD teams. In a recent study, Li, Chen and Shapiro (2010) used concentration of ownership as an independent variable to predict levels of product innovation in family firms in mainland China. They found high levels of product innovation in firms with medium-level owner concentration, while low-level product innovation was observed in firms with low or high levels of ownership concentration. The

findings of the present study provide some contrasting evidence regarding the relationship between the concentration of ownership and Taiwanese family firms' innovative performance. Higher profitability and better team morale and NPD efficiency were observed in company K, which has low ownership concentration, and in company F, which has high ownership concentration. In contrast, loss-making, low morale, and poor NPD effectiveness were found in company G, which has medium ownership concentration. The results suggest that in comparison to ownership concentration, owners' attitudes and management approaches towards R&D operations have much more potent effects on the corporate success and effectiveness of NPD projects, as well as the on morale of NPD teams. In the three cases of Taiwanese family firms, the owners adopt two very different approaches towards R&D operations. On the one hand, in case studies one and three, the owners acknowledged that they did not have the right sort of skills needed for running complex R&D operations, and therefore have hired and empowered professional managers. These owners' low level of interference, combined with high levels of trust and support towards professional managers, are indispensable for the success of NPD projects. Even though many researchers (Carney & Gedajlovic, 2003; Fukuyama, 1995; W. Ng & Roberts, 2007; Redding, 1990; Young, Peng, Ahlstrom, Bruton, & Jiang, 2008; Jianjun. Zhang & Ma, 2009) have argued that CFB owners generally are reluctant to hire or empower professional managers, the findings suggest that some are increasingly willing to do so for the sake of enhancing the innovative competitiveness of their firms. The findings also indicate that as CFBs continue to expand, owners are likely to employ more professional R&D managers from diverse backgrounds and give them more

power in order to cope with the increasing quantity and complexity of NPD projects (e.g. diversification of product range) caused by their expansion.

In contrast with this 'let the professional do it' approach, the owners of company G, in case study two, opted for a hands-on approach to managing NPD projects. The owners chose to manage NPD projects closely, as they were reluctant to relax their grip on power by appointing professional managers as NPD team leaders and allowing them to make strategic decisions. For the sake of reinforcing authority, they often undermined subordinates' opinions and contributions by criticising their designs. The owners also limited how much was spent on NPD projects as they were reluctant to invest in updating equipment or new technology. The owners' attitudes found in case study two may provide support for Morck and Yeung's (2003, 2004) theory about the motivation behind oligarchy owners' reluctance to invest in R&D and why they often use their status to undermine innovation and non-family innovators in their firms. According to the authors, oligarchy owners fear for the risks and instability brought by tolerating innovators and undertaking innovation, which, in turn, may threaten their absolute control of their firms or their 'rent-seeking activities' (e.g. rewarding themselves with a generous shareholder bonus).

Moreover, the findings of case study two also reveal that owners' desire to reinforce control, combined with dysfunctional leadership behaviours, can seriously undermine the effectiveness of NPD projects and the morale of R&D personnel. Without the right sort of technical competences and team management skills, CFB owners' high levels of involvement in NPD projects are shown to do more harm than good. This negative effects of high levels of owner involvement on family firm's innovative performance is in sharp

contrast to what Zahra (2005) found in American family firms, where higher levels of owner involvement are associated with better innovative performance. One possible explanation for such difference is probably the considerable cultural differences between American family firms and Taiwanese family firms. As Americans are highly individualist and egalitarian (Gelfand, Bhawuk, Nishii, & Bechtold, 2004; Hofstede, 1991; Javidan & Hauser, 2004), more members from the owner's family participating in NPD projects can produce more ideas, competence and skills, which in turn are likely be assessed and appreciated objectively on the basis of utility and contribution (Zahra, 2005). In contrast, in CFBs, where large power distance and authoritarianism underlie corporative governance, only powerful figures (e.g. parents or family elders) are allowed to express opinions, which are typically assessed based on seniority rather than the quality or the logic of the ideas (M.-C. Chen, 1988; B.-S. Cheng, 1993; P. K. Ip, 2009; G-F. Yen, 1996). Under such a 'might is right' value, CFB owners are often unable to make the best of the knowledge, expertise, and skills of their family members, as only senior family figures have the right to dictate decisions based on their personal preferences and intuition (B.-S. Cheng, 1995a; P. K. Ip, 2009). As a result, CFBs are prone to dysfunctional leaders who have dictatorial control but fail to perform because they lack the right sort of competences to make sensible decisions (M.-C. Chen, 1988; B.-S. Cheng, 1993; K.-K. Hwang, 1988).

Finally, the findings also provide new information on the effects of the lack of training on the effectiveness and morale of Chinese NPD teams. Previously, many researchers (H.-T. Chang et al., 2010; Egan, Yang, & Bartlett, 2004; Lee-Kelley, Blackman, & Hurst, 2007) found that knowledge

workers in the IT/high-tech industry have strong learning needs, so comprehensive on-the-job training is crucial for motivating employees and reducing staff turnover. I also found that knowledge workers in traditional manufacturing sectors, such as conservative manufacturing CFBs, also have strong learning needs and they also consider on-the-job training as an important part of job satisfaction. Chow (2004) argued that even though Taiwanese firms generally have strong on-the-job training needs, most of them are unable to provide their employees with adequate on-the-job training. The findings of the present study show that this may still be the case for small and medium-sized CFBs, but not necessarily for large multinational CFBs. Under the Taiwanese government's policy of promoting innovation, large firms now enjoy higher tax credits for R&D expenditure and training (S. Chu, Chou, Chou, Williams, & Tsai., 2010), and thus they can afford to provide their employees with comprehensive on-the-job training. In contrast, small and medium family firms benefit relatively little from this policy, as their small operational scales may not meet the criteria for tax deductions for R&D investment. As a result of receiving very little government subsidiary and having to absorb the cost of on-the-job training, SEMs are often reluctant to invest in comprehensive staff training as it is commonly regarded as unaffordable and unnecessary (Chow, 2004). However, as evident in case studies two and three, the lack of training in medium-sized CFBs has led to low morale and high turnover among young R&D workers because their learning needs are not satisfied.

9.1.2 Implication for Mainstream Team Innovation Literature

Salas and colleagues (Salas et al., 2008; Salas & Wildman, 2009) pointed

out that as decontextualised experimental team studies dominate existing team literature, much remains unknown about how culture and context affect how real-life teams work and innovate. The findings add to the mainstream team innovation literature by providing a more comprehensive understanding of the complex effects of contextual factors on creativity or innovation in real-life NPD teams. Based on what was found in the three case studies, four aspects of their context – sociocultural norms, industry-related factors, organisational traits, and key characteristics – were found to have interrelated, complex effects on how these teams work and innovate, as illustrated in the empirical framework in Figure 8.1. Even though West (2002) argued that external demands or the external context of the team may inhibit creativity or idea generation in teams, the findings of this study indicate that not all aspects of team context have such effects. As summarised in Table 8.5, which provides a multi-level review into the contextual inhibitors and facilitators of creativity/innovation, some contextual factors may have fostering effects, while other have inhibiting effect. There are also others which can function like a double-edged sword.

9.1.2.1 Sociocultural norms and team creativity/innovation

In terms of societal-level context, as creativity and innovation in teams and organisations are products of social processes, researchers have argued that cultural or sociocultural values, which provide references and guidelines for social interactions, influence how we perceive and react towards creativity, novelty or the usefulness of ideas (Chiu & Kwan, 2010; Gelfand et al., 2007; Lau, Hui, & Ng, 2004). Yet, Erez and Nouri (2010) argued that existing studies on the effects of sociocultural values on team creativity are

very limited and the empirical evidence is often inconsistent and contradictory. The findings may add to the literature by providing a fresh insight into the effects of three cultural values on teamwork and team innovation: hierarchy, interpersonal harmony, and diligence.

First, consistent with the existing literature (V. Cheng, Rhodes, & Lok, 2010; Jiang & Cheng, 2008; Warner, 2010), sociocultural values related to hierarchy were also found to have influential effects on how CFB teams are managed and on leader-subordinate interactions in these teams. Values such as 'respect for leader/senior personnel's authority by complying', 'paying close attention to hierarchical status and behaving accordingly', and 'mighty is right', which resemble key traits of the high power distance culture proposed by Hofstede (1980), are used widely as principles for constructing and interpreting workplace behaviours by CFB workers. These values are shown to constrain creative and innovation in CFB teams, as they can lead to a biased assessment of ideas and can impose high conformity pressure on junior workers. The findings may also provide empirical support for previous assumptions (Erez & Nouri, 2010; K. Y. Ng & Van Dyne, 2001; Tinsley & Brett, 2001), that large power distance inhibit open communication and discourage dissent and the expression of creative ideas.

Second, even though many researchers (Chow, 2004; Ho, 1993; Hui & Triandis, 1986; P. K. Ip, 2009; The Chinese Culture Connection, 1987) have suggested that collectivism and interdependent self-constructs are the main cultural antecedents behind Chinese people's desire for interpersonal harmony, the results indicate that in the context of Chinese work teams, interpersonal harmony is valued highly for its utility rather than for its referencing power for self-constructs. For CFB workers, harmonious work

relationships are valued as an indispensable social capital for surviving, fitting in and long-term collaborations rather than as important references for who they are. Moreover, consistent with Leung and Wu's (1998) propositions, the findings also suggest that Chinese workers' desire to pursue interpersonal harmony can function like a double-edged sword on team effectiveness. On the upside, it may help to enhance work efficiency, as team members adopt an objective attitude towards task-related conflict and are willing to sacrifice individual gains to compromise, yield or conform to resolve disputes or disagreements speedily for the sake of the collective good and harmonious work relationships. This may support Tjosvold et al.'s (Tjosvold, Chun, & Law, 2001; Tjosvold et al., 2006) argument that the Chinese are more likely to cooperate and manage conflict for mutual benefit rather than to compete and win at others' expense. On the flipside, the individual pursuit of interpersonal harmony may also hinder collective efficiency or undermine creativity, as workers withhold information or creative ideas to avoid antagonising others or causing conflict. For instance, they can be reluctant to point fingers at colleagues' faults or criticise their designs, even though they are aware of the possible problems or flaws. Therefore, as previously found in the literature (Leung et al., 2002; Leung & Wu, 1998; Yan & Soreson, 2004), interpersonal harmony at the work place may come at a price – collective efficiency may suffer as individuals pursue harmony.

Third, similar to previous studies (Chow, 2004; Farh, 1995; Redding & Wong, 1986), the societal value of diligence is also shown as a work ethic commonly held by CFB workers. The findings may broaden our understanding by demonstrating how the societal value of diligence affects

team dynamics. In CFB teams, diligence is a key cultural antecedent behind a hard-working spirit and a shared sense of responsibility, which in turn may foster creativity. For instance, in order to fulfil their duty as design personnel, NPD personnel generally would try to incorporate their creative ideas and expertise into their work, or to share their ideas with colleagues as much as possible. Such duty-driven motivation to be creative may be quite different from the individuality-driven or self-fulfilling-driven motivation commonly observed in Western contexts (Amabile, 1999; Morris & Leung, 2010).

9.1.2.2 Industrial-level context and team creativity/innovation

There are conflicting findings regarding the effects of industrial context on the effectiveness of NPD teams or NPD projects in the existing literature. The findings may contribute to the literature in this domain by provide some new insight regarding the effects of industrial contexts on team dynamics. The results reveal that manufacturing industry-related factors, such as market competition and high levels of vertical integration in the industrial supply chain, can function like a double-edged sword on the effectiveness of NPD teams. On the one hand, close collaboration with industrial alliances (e.g. suppliers and clients) and market competition and fluctuation may have positive effects, such as inspiring creativity or enhancing the quality of new products. For instance, by involving clients and suppliers throughout the development of new products, the three CFB NPD teams were able to detect possible flaws, improve designs, and reduce operational risks based on these external parties' comments. This supports Brown and Eisenhardt's (1995) proposition that external team processes such as communication with clients and suppliers are beneficial for improving team performance, as they 'open

the project team up to new information' (p.368). Such a positive effect is in contrast to what Chang, Hu and White (2004) found in Taiwanese manufacturing NPD teams, where close supplier and client involvement throughout product development was shown to have no effect on the quality of new products. On the other hand, clients' strong bargaining power and pressure to satisfy their demands swiftly throughout the development of new products can put strain on NPD teams by causing disruption or increasing their workloads and stress, which in turn may hinder creativity. This may provide support for West's (2002) argument that external demands may cast constraints on teams and thus inhibit creativity. Overall, there seems to be a consensus among CFBs' R&D executives that the benefits of working closely with industrial alliances when developing new products outweigh the shortcomings, so they are keen to manage long-term collaborations with these external parties.

9.1.2.3 Organisational-level context and team creativity/innovation

Doolen et al. (2006) argued that even though organisational context have influential effects on how teams work and innovate as the two have a coupling relationship, much is unknown about its effects on team effectiveness. The findings of the current study may shed a new insight into this domain by illustrating the effects of the organisational pursuit of efficiency on team innovation. Consistent with previous studies (Redding, 1996; Weidenbaum, 1996; T. F.-L. Yu, 2001), CFBs generally are highly efficient entities in which a great deal of emphasis is placed on efficiency, thrifty, and pragmatism. These organisational policies are shown to have complex effects on their NPD teams. On the one hand, they are shown to

function like stressors which inhibit creativity or innovation. Previous studies (Akgün, Byrne, Lynn, & Keskin, 2007; Amabile et al., 1996; Doolen et al., 2006; Folkestad & Gonzalez, 2010) indicate that in order to foster creativity or innovation, organisations have to provide a safe and supportive environment by offering sufficient resources and managerial or technical support, allowing calculated failures and risk-taking and rewarding employees for their creative performance. Generally speaking, CFBs seem unable to provide such an innovation-friendly environment, as they have a low tolerance for failure and risk-taking, very small R&D budget, substantial workloads and inadequate rewards for individual creativity. As a solution to these unfavourable conditions, NPD teams often opt for relatively low-cost and more practical incremental or copycat innovation instead of more expensive and risky radical innovation. On the other hand, CFBs' other organisational context such as their constant pursuit of efficiency, cost-cutting, and pragmatism may have some positive effects on how their teams work and innovate, such as motivating teams to maximise the utilisation of available resources and to work hard for the sake of collective efficiency.

9.1.2.4 Team-level context and team creativity/innovation

The findings may have two implications for the literature on team context. First, there is conflicting evidence in the existing literature regarding the effects of diversity on team effectiveness or on team creativity. Some (Gebert et al., 2006; Hülshager et al., 2009) have found that diversity may enhance team effectiveness, while others (Mohammed & Angell, 2004; van Knippenberg & Schippers, 2007) described it as a hindrance. The results

support that age diversity as a non-task-related or demographic type of diversity can hinder team effectiveness and creativity. The age diversity found in CFB teams is shown to impede creativity, cause conflict and obstruct open communication between old and young workers because the two generations have very different values and attitudes towards creativity and risk-taking.

Second, even though Chen, Hsu and Lin (2011) argued that an emphasis on individual performance appraisal may hinder knowledge sharing in teams, because doing so may erode personal gain or the distinctiveness of personal knowledge, the results of present study suggest otherwise. Under MBO policy and a highly hierarchical teamwork pattern, individual members in CFB teams are assigned a specific set of tasks and their individual performance is closely monitored and evaluated by their immediate superior on a daily basis. As a result, individuals generally are keen to share what they know with fellow team members and to offer a helping hand without asking (e.g. they actively offer advice when they spot others having problems). This is because doing so can help them to gain recognition, and thus improve their personal performance appraisal.

9.2 Practical Implications

In addition to theoretical implications, the findings may also offer several practical implications. First, the results reveal that when owners do not have the right sort of technical expertise and project management skills, it would be more sensible to hire and empower experienced professional managers. Owners' constant interference and dysfunctional leadership behaviours are shown to undermine the effectiveness of NPD projects and

the morale of R&D personnel. Owners can use a list of questions shown in Appendix 5 to reflect on whether they have the right skills for managing R&D. Moreover, they may also consider electing a family executive to oversee the R&D operation rather than involving all family executives. Given that personal feuds and power struggles are common in CFBs (M.-C. Chen, 1988; Yan & Soreson, 2006), appointing a single overseer as the team leader may help to ensure the consistency of R&D policies and prevent personnel being dragged into disputes between family executives.

Second, CFB owners and managers may be able to make their organisations more 'innovation-friendly' through measures such as reducing the emphasis on hierarchy, investing more in R&D, and raising tolerance levels for failures or risk-taking. In terms of hierarchy at the workplace, the findings suggest that Taiwan's younger X, Y generation workers dislike the traditional hierarchical work pattern and authoritarian control, as they prefer a more egalitarian, competence-based management approach. As more young workers enter the workplace to replace baby-boomers, traditional management practices that place greater emphasis on authority over rationality and competence are expected to become increasingly ineffective for managing and retaining young R&D talent. In terms of investing on R&D and tolerance of failure, the findings indicate that insufficient resources (e.g. scant R&D budgets and shortages in manpower) and a low tolerance of failures are major deterrents for innovation, especially radical innovation in CFBs. Even though the firms investigated in this study are all capable of developing radical and unique new products, they are reluctant to invest large sums in risky and costly radical new products. Therefore, instead of embarking on ground-breaking radical projects, they often settle for

lower-cost but also less profitable incremental or copycat innovation. Such an 'able but unwilling' attitude is likely to impede CFBs' innovative competitiveness in the long-run.

Third, the findings also indicate that comprehensive on-the-job training can be highly beneficial for inspiring creativity, improving R&D efficiency, and motivating and retaining young talent. Therefore, CFB owner or R&D managers should consider investing in continual and comprehensive training, which may not necessarily require large monetary investments but would require considerable time and effort to maintain and manage. Managers can consider regular job rotation, building database/archives of past NPD projects, inviting in-house experts to give talks or collaborating with universities and vocational schools as providing employees with on-the-job training.

9.3 Limitations and Directions for Future Research

The findings and their implications should be reviewed with the following limitations in mind. First of all, I used indigenous psychology as the theoretical perspective because it allows researchers to take culture and context into account and to explore what really matters for cultural insiders from their points of view. As several indigenous psychologists (e.g. B.-S. Cheng et al., 2008; Leung, 2009; K.-S. Yang, 2005b) have suggested, this emic/cultural-insider perspective should enable more accurate and in-depth understandings of a specific ethnic group. Even though some (Ho, 1993; Sinha, 1997) have criticised that indigenous psychology studies contribute very little to the global academic community, as the findings are intertwined with 'cultural specific elements' of a specific group/setting and thus cannot

be generalised universally, many (e.g. S. X. Chen, 2010; B.-S. Cheng et al., 2008; Enriquez, 1993; Leung, 2009) argue that they provide opportunities for researchers in other cultural settings to reflect on or to re-evaluate their own perspectives and previous findings obtained in their home countries. For instance, Jackson (2005) stated:

'... , where theoretical developments within one culture pose challenges to academics in other cultures to re-evaluate and enrich their own perspectives. The development of multiple indigenous psychologies has potential for enriching the psychological community as a whole, by raising the aggregate level of the whole landscape on which psychologists operate, whatever their cultural background' (p.53).

In line with Jackson's proposition, others (S. X. Chen, 2010; Enriquez, 1993; Segall et al., 1990) also indicate that the indigenous psychology study of one culture may serve as a starting point for uncovering universality in the human psyche, which may be achieved through conducting parallel indigenous studies across multiple cultural settings. In the light of this proposition, the findings of this study may provide some directions for future research. For instance, researchers may examine how the contextual factors identified in this study affect teams work in family firms embedded in other cultural settings. For instance, CFBs generally prioritise cost-effectiveness, efficiency and pragmatism over novelty when it comes to product innovation, while they place great emphasis on hierarchical control, interpersonal harmony and a collective sense of responsibility when it comes to teamworking. It may be interesting to conduct parallel indigenous research to investigate whether these teamwork patterns can be found in Western family firms (e.g. British family firms). Such cross-nation indigenous

psychology studies may help us to gain a more comprehensive understanding of what really matters and what works when it comes to managing teams in family firms across borders.

Second, as family firms generally are highly secretive entities (D. Ip, 2000; Neubauer & Lank, 1998), a strategic/theoretical sampling strategy was used for the sake of access, theoretical representativeness of the samples, and the relevancy of data for answering the research questions. For these purposes, I restricted my investigation to Taiwanese manufacturing family firms, but the choice of samples may constrain the applicability of the findings. As Taiwan's sociocultural values are shown to affect teamwork and team innovation in Taiwanese family firms, the findings may be applied to organisations with characteristics similar to CFBs, or to firms which are embedded in similar sociocultural settings. Given that Chinese people across Chinese societies share many common cultural values and use them as principles to manage organisations and people (Bond, 1991; L. H. Lin & Ho, 2009; Redding & Wong, 1986; Tsang, 2001), the findings may be applicable to the wider Chinese context. In contrast, they may not be generalisable for explaining team innovation in family firms embedded in very different sociocultural settings (e.g. American or European family firms). Future research would therefore be needed for testing the cross-cultural applicability of the findings. Moreover, the use of manufacturing CFBs as samples may also restrict the generalisability of the findings. Even though manufacturing family firms are the most common type of CFB (Carney, 1998), further research is required to verify whether the findings can be applied to CFBs across all industries because manufacturing industry-related factors, such as high levels of vertical integration in the industrial supply

chain, were found to have influential effects on team processes and moderating effects on team effectiveness.

Third, I used the qualitative case study as a research strategy because it is highly suitable for exploring complex teamwork and innovation processes and for verifying multi-level relationships (Baxter & Jack, 2008; Creswell, 1998). The mono-method approach and the context-bound, inductive nature of qualitative case studies may constrain the generalisability of the findings. In order to curb mono-method and researcher's bias, I used cross-cases triangulation and data triangulation. By conducting multiple case studies, researchers may improve the reliability of their interpretations by finding repeating themes and by refining interpretations based on anomalies (Andrade, 2009; Baxter & Jack, 2008; Eisenhardt & Graebner, 2007). By using different sources of data, I was able to compare my interpretation of what was said (i.e. interview statements) against objective secondary data (e.g. company statistics or government data). Both data and case triangulation should help to improve the accuracy and reliability of the theoretical narratives derived from multiple case studies (Bowen, 2005; Jonsen & Jehn, 2009). Future research may consider using quantitative measures to test the theoretical narratives on a larger, more diversified sample to verify their generalizability and to test the statistical significance between theoretical constructs identified in the theoretical narratives. For example, quantitative measurements and statistical can be used to evaluate the 'strength' of the contextual facilitators and inhibitors on team creativity identified in this study on a wider, bigger sample.

9.4 Conclusion

This study set out to explore teamwork for production in the context of CFB NPD teams from a cultural insider perspective. On close inspection, the findings reveal that these teams are managed in a highly hierarchal, controlled manner, while there is a collective concern over efficiency, thrifty, pragmatism, and interpersonal harmony. On the upside, this teamwork pattern seems to be quite effective, as the teams are able to deliver new products swiftly and efficiently with this approach. On the flip side, it is shown to impose high conformity pressure and constraints on creativity or the exchange of creative ideas in these teams.

Another lesson learned from this study is that CFB NPD teams are probably not ideal incubators for innovation, especially radical innovation, as many aspects of their work context can impose restrictions on how they work and innovate. At sociocultural-level, the constraints of sociocultural norms mean that individuals are restricted to expressing ideas in accordance with their status or sociocultural expectations (e.g. showing respects) rather than expressing what they really think. At the industrial-level, pressure to respond to client demands swiftly can be stressful and distracting. At the organisational-level, limited R&D budgets, scarce resources, and a low tolerance for failure in CFBs are major deterrents for innovation and risk-taking. At the team-level, the generation gap and large age diversity can obstruct the exchange of creative ideas, while the heavy workloads and constant shortage of manpower can be stressful to cope. As a result of these contextual limitations, CFBs' R&D personnel are not really allowed to let their creativity roam free, and consequently, they often prefer more practical

incremental innovation over difficult and demanding radical innovation. Nevertheless, despite these unfavourable work conditions, they still work hard to complete tasks swiftly and would try to incorporate creative ideas in these tasks as much as they can, for the sake of individual performance appraisal and collective efficiency. The hard-working spirit and a shared sense of responsibilities may compensate, to a certain extent, for the negative effects of contextual inhibitors on team effectiveness.

As Chinese economies continue to grow at a high pace and become indispensable engines for global economic growth (Ding, Zhang, & Zhang, 2008), the findings of this study may shed a new light on the secrets behind the innovative success of indigenous Chinese firms. Generally speaking, NPD teams in CFBs are quite good at incremental innovation, as they are able to deliver new products efficiently and swiftly – even with limited budgets and scarce resources at their disposal. Although they are also capable of achieving radical innovation, they are often reluctant to do so because this type of project is considered more expensive and riskier, so they are not very practical options. This 'able but unwilling' attitude towards radical innovation may jeopardise CFBs' ability to compete and innovate in the long-run. Given that family firms play important roles in all major economies in the world (Deng, Huang, Carraher, & Duan, 2009; Steier, Chrisman, & Chua, 2004), what we have learned from CFB teams may provide opportunities for both practitioners and scholars to reflect on what works and what does not work when it comes to managing product innovation and NPD teams in the context of family firms.

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Notes

1. The widely adopted concepts of 'emic' and 'etic' were proposed by Pike (1954). He derived the terms of 'emic' and 'etic' from the linguistic concepts of 'phonemics' (the study of sounds whose meaning-bearing roles are unique to a particular language) and 'phonetics' (the study of universal sounds used in human language, their particular meaning aside) (c.f. Berry et al., 2002; Segall et al., 1990; Smith & Bond, 1998). The distinction between emic and etic approach can be regarded as a conceptual tool which is used by cultural psychologists (i.e. cross-cultural psychologists, cultural psychologists, and indigenous psychologists) to help them choose their fundamental theoretical assumptions and methodological approaches (Morris et al., 1999).

Generally speaking, etic (i.e. universal) approach seeks to uncover universal laws in the human psyche which is the primary goal of cross-cultural psychology so that this approach is typically associated with cross-cultural psychology (Berry, 2000). This is usually done by testing presumably universally applicable measurements (e.g. questionnaires) on different cultural groups to compare their similarities or differences. Given that researchers would be imposing research instruments which are developed in their home culture on other cultural groups in their quest for uncovering universality, this approach is also known as the imposed-etic approach (Segall et al., 1990).

On another front, emic (i.e. cultural-specific) approach seeks to gain in-depth understanding of the mentality, causes and mechanisms behind cultural-specific phenomena within a single culture (Kim & Berry, 1993).

Unlike etic/imposed etic approach assume their findings are universally applicable, researchers, who adopt emic approach, acknowledge that their findings are context-bound and may not be applicable to other cultural settings. This is mainly because they used cultural insiders' knowledge, perspective, and subjective feelings as the source of understanding while taking contextual factors into account (Segall et al., 1990). Therefore, emic approach is also known as the cultural insider approach which is commonly employed by indigenous psychologists, cultural psychologists and ethno-psychologists (Berry, 2000).

2. Codes were used to protect the confidentiality of the participating companies and their employees.

3. The 'Global Leadership and Organisational Behaviour Effectiveness Research Program' (GLOBE) (House et al., 2004) is a replication of Hofstede's (1980) landmark research. The Globe researchers have refined and extended Hofstede's (1980) original measurements of culture and tested these measurements on more societies. These researchers claimed their research is aiming to 'explore the fascinating and complex effects of culture on leadership, organisational effectiveness, economic competitiveness of societies, and the human condition of members of the societies studied' (House, 2004a, p.10). Like Hofstede, the GLOBE researchers also employ the imposed-etic approach that they believe measurements developed in Western culture are universally applicable to all ethnic groups therefore they can be tested on different ethnic groups to see how similar or how different they are.

4. Unlisted companies are usually privately-owned companies, which are not listed on the stock market. In Taiwan, shares from these unlisted companies can be bought or sold, but the laws or regulations relating to the trading of shares from unlisted companies are grossly inadequate. Fraudsters or thugs often exploit this loophole in the regulation; so it can be very risky for an unlisted company to sell its shares to outsiders or strangers. In the past few years, there have been many cases of CFB owners who have lost their firm to fraudsters disguised as investment bankers. Fraudsters often pretend to buy shares from the legitimate CFB owner but their real target is to strip away all valuable assets of the firm for profit.

5. Stone-Romero (2002) suggested that 'experimenter expectancy effects' are common in experimental research. This expectancy effects explain the expectation which both researchers and participants may have in experiments. For example, researchers may expect their participants to behave in a specific manner, while participants are also likely to behave in a peculiar manner because they think they are expected to behave in such way (Stone-Romero, 2002). If participants know the purpose of the research, they may also alter their behaviour in order to 'collaborate' with the researchers or with other participants rather than revealing their usual self. Therefore, under the influence of the 'experimenter expectancy effects', behaviours observed in the laboratory setting are unlikely to be truly representative of real life scenarios.

6. Some interviews were cut shorter because previous interviews overrun or

foreseen schedule clashes. As a researcher, I had no control over scheduling, which was arranged by the team leaders of the three CFBs that this is just one of the dilemmas researchers face when doing field work. Nevertheless, although some of the interviews were cut short, most of them still covered most of the target research topics and yield useful information about teamworking for product innovation in CFBs.

7. Although content analysis is regarded as a qualitative data analysis technique by Silverman (1993), Berg (1998) argued content analysis should be considered a 'blend of qualitative and quantitative analysis' (p.242). Content analysis is mainly used for counting frequencies of categories or phrases, and this focus on numbers or frequencies resembles much of the quantitative approach because it tends to define meaningfulness in numbers or in statistical significance. For qualitative researchers who are interested in understanding the complicated nature of social phenomena, content analysis has very little to offer because counting how many times phrases or categories have emerged in the data alone cannot help us to understand relationships between these variables/ theoretical concepts or the phenomenon in research.

8. The new director is in charge of the day-to-day management of the R&D department, while the formal director, who has left the R&D department to take charge of the overseas-operation department, only participates in key decision-makings of R&D activities. By keeping formal director in partial control of the R&D department, the family owners can make sure formal director can still contribute his decades of experience and expertise to the

development of new products and new technologies. However, having two directors means there are bound to be office politics; but despite this, the dual-directors structure seemed to be working just fine.

9. ISO certificate (e.g. ISO9000) is a type of quality standard certificate certified by International Standard Organisation. In order to acquire ISO certificate, the firm has to set up and follow sets of standardisation procedures. ISO also have a set of recommendations about how firms should approach product innovation, such as operational procedures, documentations, and how they should deal with client demands and requests.

10. The Gre-Tai Securities Market, (the GTSM, or the '台灣上櫃證券交易市場' in Mandarin), is a secondary stock exchange for smaller public companies in Taiwan. In a way, the GTTSM is similar to the FTSE 250.

11. This structure of Company G's R&D team was based on interview data obtained at late 2005. The structure of Company G's R&D department/team later changed considerably due to several management reshuffles according to a key informant.

12. Information was obtained via http://emops.twse.com.tw/emops_all.htm, access date 10, May, 2010, internet location: Birmingham, UK. Company G made losses from 1999-2004, and then 2006-2009 that the firm has made post-tax profit in 2005, but only just.

13. The cash reward for good reports submitted to the proposal-appraisal panel ranges from 50 to 1000 new Taiwanese dollars (N.T.D), which is roughly equivalent to one to twenty British pounds. It's petty cash really, judging from a British standard of living.

Appendices

Appendix 1: Interview plan used in the interviews (Mandarin version)

訪談計畫書與紀錄

訪問者/研究員：張敏玟

時間與地點：_____ 公司組織：_____

受訪者：_____ 工作職稱：_____

訪談地點：_____

論文簡介和保密協定

您好，我現在是在做關於台灣團隊創新模式的博士論文研究，那我研究的重心是在於團隊內人際互動對於團隊工作以及創新創意的影響。研究的對象：是台灣製造業的研發團隊，那為了了解到團隊的實際互動，我需要來訪問團隊的成員來了解關於團隊的工作及創新模式，所以現在才會來訪問您。

等一下我會請教您一些關於團隊工作的事，再請您聊一聊您的個人的經驗，那為了後續的資料分析所需，希望您不要介意我錄音，那如果有需要的話 我可以提供您錄音的檔案和譯本，但是這個錄音的檔案是只有提供給受訪者本人 並不會提供給受訪者以外的人，當然您的經驗分享我純粹是用來博士論文的研究之用，請您不用擔心保密性的問題，將來等到資料分析完了以後，因為論文報告是採匿名報告的方式，不會把受訪者的身分用上去。

我會把團隊整體分析的結果作成專案報告繼回來給貴團隊，那當然最終正式的博士論文出版之後，我也會致贈給貴團隊，那先謝謝您的參與，在我們正式開始前，可以請問您一些關於您的工作經驗的問題嗎？

參與者的個人資料

年資： _____

E-mail: _____

連絡方式/名片： _____

訪談大綱與重點問題：

1. 組織架構

- 家族企業所有權
- 組織大小
- 組織歷史

- 產品

2. 研發團隊的架構與管理

- 可不可以請您談談您的團隊？
- 團隊大小（人數、成員、預算）
- 團隊的歷史、成立多久？
- 管理模式、考績（個人考核及團隊整體表現的考核）
- 是否採責任制？
- 家族成員的比例？
- 來自家族管理階層的壓力與干涉（淺談管理階級的家族成員，有多少位？他們是否參與團隊工作或干預產品研發過程）

3. 團隊創新或產品開發的流程

- 可不可以請你談談這個團隊對工作的流程？
- 一般性的工作
- 開發新的產品
- 新的工作方式 或（過去沒有做過的工作時 大家是怎麼合作的）
- 新產品的開發數量，新技術？
- 你覺得人際溝通對於團隊工作的影響如何？

4. 團隊內部的創意來源與創新的動力

- 在團隊內關於創意的發想？
- 是誰說要去做新的事/新的產品，為什麼要做新的產品，背後的動力來源
- 誰是點子王？新點子的來源？
- 你是否有嚐試過不同於以往的作事方式，例如新的作業流程，新的行銷方式？

5. 創意提案之後誰做決定

- 從點子到付諸實行過程
- 誰做最後裁決，誰有權決定？
- 誰去執行？
- 是否有家族成員的參與？家族成員的參與程度？

6. 團員的參與和互動

- 可以請您談一談您覺得這個團隊互動的情況如何？
- 在人際相處上，人情與面子對於工作上的影響？
- 大家的參與程度，配合程度？
- 困難點的排除---1.請求公司內部人員的支援？
2.是否有利用外部人際關係去找資源 或者是找資訊？

7. 團隊內的溝通模式和團隊外的溝通

A. 正式的溝通管道 v.s. 非正式的溝通管道

- 你們一般怎麼溝通？正式的溝通？或 非正式的溝通？
- 有一些東西在正式的場合不好拿出來說，那你會不會私底下找機會跟老闆或同事拿出來說？

B. 意見不同或者是衝突的處理與解決

- 當大家意見不同時要如何處理？
- 以和為貴，避免衝突？或者你會據理力爭，堅持己見？

C. 來自上級的壓力與多數壓力

- 會不會有老闆說了算？即使你知道這樣的決定是不恰當的？
- 如果你的意見不被老闆採納，那你是否會找其他的機會把你的意見在跟別人講？
- 在開會時如果有來自上級或多數的壓力，你是否會堅持己見？還是會屈服於多數壓力和來自老闆的壓力？

D. 少數異意

- 當你的意見跟其他人的不同，你會不會想辦法把自己的意見作出數據或者東西，然後再跟老闆或同事提出？
- 如果會，當其他人接受你的想法後，你會不會覺得這樣的感覺很好，然後以後還會想用類似的方法表達自己的意見？
- 這樣溝通模式（少數異議）對於創造力，和產品開發的影響？

8. 領導

- 老闆或主管的領導方式
- 老闆和主管的支持
- 傳統 V.S 現代式的管理 管理代溝
- 來自家族成員的壓力

9. 對你而言 在團隊裡作產品開發最重要的是什麼呢？

- 目前這樣的團隊工作來做產品開發效率如何
- 有什麼可以改進的地方？

Appendix 2: Interview plan (English version, translated from the Mandarin version for reporting purpose)

Interview Protocol and record

Interviewer: Sophie Chang

Date and time: _____

Affiliation: _____

Interviewee: _____

Job title: _____

Place of interview: _____

Introduction of the research and confidential statement

Greetings, I am currently doing doctoral research on teamwork for innovation in the context of Taiwanese family firms. The focus of my research is on how interpersonal interaction and teamwork pattern affect innovation and creativity in Taiwanese family firms. My research subjects are R&D teams in Taiwanese family-owned manufacturer firms. So, in order to understand how real teams work, I have to interview team members on a one-to-one basis in order to understand how you work and innovate in teams. That's why I am here to interview you. Please feel free to talk about your personal experience related to teamworking and innovation. Moreover, I hope you would agree to the recording of the interview. The recording is necessary for subsequent data analysis. Of course, if you wish, I can provide an audio file of your interview and the transcripts. This audio file or transcripts will only be made available to you, not anyone else besides me. So please do not worry about the confidentiality of your statements as the identities of interviewees will be kept anonymous. Also, the audio files and the interview statement will only be used for academic research.

Moreover, I will send a feedback report about how your team works as a whole as soon as the data analysis has been completed. I will also send a

copy of my doctoral thesis as a writer's compliment. Thanks in advance for your participation. Before we proceed to the interview, may I ask you for some work- related personal details?

Participant's personal details

Tenure: _____

E-mail: _____

Contact/ Business Card: _____

Interview topics and prompts:

1. Information regarding organisational structure

- Family ownership
- Company history
- Size
- Product portfolio

2. Team structure and management

Can you talk about your NPD team?

- Size of the team (e.g. how many team members?)
- History of your team.
- Performance appraisal (e.g. how is performance assessed in your team?
On an individual level or on overall/collect team level?)
- Does your team/organisation adopt a 'management by objective' policy?
- How many family members (of the controlling family) are in this team?
- Is there any pressure or intervention from the controlling family members? (How about members of the controlling family in the senior

levels, who they are, do they participate in this team? Or do they intervene in the product innovation processes?)

3. Teamworking processes for product innovation & product innovation processes

Can you please talk about how you work as a team?

- Routine work/tasks.
- NPD projects.
- New ways of working (when doing something people have never done before, how do they cooperate?)
- Quantity of new products or new technology (per year).
- How does interpersonal communication/interaction affect how you work and innovate as a team?

4. Idea generation with teams, inspiration and driving forces for innovation

- What are the driving forces or inspiration for product innovation/NPD projects?
- Who get to decide the development of new products?
- Sources of ideas or inspirations for creativity and designs?
- Who plans and organizes NPD projects?
- What new things have you learnt while working in this team? For instance, new technology, new product design, new marketing ideas, or new production arrangements?

5. Decision-making and implementation

- The overall process of generating ideas, decision-making to the

implementation of new products.

- Who decides?
- Who has the power over what?
- Do you have any say in the decision-making process?
- How do you perceive your level of participation in the decision-making process?
- How are the decisions implemented? Who does the 'leg work'?
- Are any family members of the controlling family involved in the innovation process, the decision-making processes or the implementation of the new product development process?

6. Team members' interactions and participation

- How do you interact with each other in the team?
- How important are smooth interpersonal interactions for working in teams?
- Effects of *Guanxi* or *Zen-Ching* on working in teams and doing innovation.
- Cooperation between team members and with other organisational members or relevant outsiders (e.g. clients, suppliers, etc.).
- Collaborating in order to solve problems—how do you solve problems or deal with difficulties encountered at work?
- What do you usually do when you face problems?
- Would you ask for help within the firm or would you use your personal connections to seek help, resources or information outside the team or outside your firm?
- If you do ask for help, can you give examples?

7. Intra-team communications and communication outside team boundary

How do you communicate?

A. Formal or informal communication

- What types of communication do you use most frequently: formal or informal communication? (In what circumstances?)
- If there are some sensitive issues or opinions which may be inappropriate to express in formal meetings, would you discuss these issues or share your thoughts privately or informally afterwards?

B. conflict resolution—

- How are conflicts resolved or dealt with in your team?
- Is there an emphasis on preserving harmony within your team?
- Would you actively avoid causing conflict in order to preserve harmony?
- Or would you insist on your own opinions when you disagree with others?

C. Pressure from the top (pressure to comply) and conformity pressure ---

- Would you obey orders or decisions from your superiors even if you know their decisions are flawed or can lead to problems?
- Would you dare to argue/confront with superiors when you have different opinions/ thoughts about tasks or designs?
- If your superior refuses to accept your opinion, would you try to share your thoughts with others (such as colleagues)?

D. Minority dissent

- When your opinions are different from the majority opinion or different

from your superior's opinions, would you insist or stick to your own ideas, or would you simply give up and conform with the others?

- When you have a (minority) opinion or thoughts, would you turn your thoughts into statistics or prototypes and then present your opinions again?
- If you express your dissents later and your ideas were accepted, would you feel good about it? If you were successful at sharing latent dissents, would you do it again?
- Do you think sharing different opinions or hanging on to your own ideas/principles can be important to the team such as improving the design or spotting problems?

8. Leadership in Teams

- Who lead the team? Who's the boss and what does he do?
- How do you perceive your leaders and their leadership patterns?
- Do you think they are more 'traditional', father-figure like' or are they 'modern type of leaders' who emphasize performance and being objective?
- Do you think there is a generation gap between the leaders and the younger team members?
- Do you face pressure from members of the controlling family when working in teams and developing new products?

9. What matters for doing product development in teams?

- How efficient or successful are you as a team? Stories about past success or failures? (e.g. patents, numbers of new products developed per year)
- Is there any specific issue that you want to raise to help improving the efficiency of your team/firm? Issues/on-going problems to be tackled?

Appendix 3: Coverer letter (Mandarin version)

博士論文研究計畫

研究者：張敏玟

英國 Aston 大學 管理學院 職業與組織心理學部門

論文題目：

台灣家族企業中團隊創新模式：製造業家族企業中的研發團隊的個案研究

研究目標：

本研究主要的目標是研究台灣的團隊的創新模式,而本研究的重心在於以心理學的角度來探討團隊中人際互動對於團隊工作及創意創新的影響。

研究方法

為了了解團隊成員之間的人際互動以及工作模式,本研究採取與主要研發團隊成員一對一訪談,訪談的內容將會包含六大方面:

2. 研發團隊的架構 與 管理
2. 團隊創新或產品開發的流程
3. 團隊成員的工作分配 與 責任歸屬
4. 團隊內部的創意來源與決策執行
5. 團員的參與和互動
6. 團隊內的溝通模式

訪談的時間每位團隊成員約在一個小時左右, (而為了後續的研究分析所需,希望您能同意我將訪談的內容錄音,若有需要我也可以提供完整的譯本以及完整的錄音的檔案給您,但此錄音檔案只會給予受訪者本人,而論文報告也會以匿名報告的方式,所以請不用擔心保密性問題)

研究成果分享與回饋：

所有的訪談內容以及企業資料純粹用為學術研究之用,而研究結果除了博士論文以及在國際學術性期刊上發表外,不會挪作他用。若您願意參與本研究,我將會在訪談資料整理告一段落後,另外提供根據訪談結果分析後所得的團隊互動分析,並給予如何提升團隊團隊創新的建議。當然最後的研究成果將會是我博士論文的一個重要部份,在博士論文正式出版後,我將致贈貴團隊完整的博士論文,希望屆時您能再給予我批評和指教。

非常感謝您的參與與支持

博士班研究生 張敏玟

e-mail: changm@aston.ac.uk

Appendix 4: Cover letter (English version, translated from the Mandarin version for reporting purpose)

Doctoral Research Project

Doctoral Researcher: Min-Wen Sophie Chang

Work and Organisational Psychology Group

Aston Business School, Aston University, United Kingdom

Research topic:

Models of teamwork for innovation in Taiwanese manufacturing industry:

Case studies of product development/ R&D teams in family-controlled manufacturing firms

Research Objectives:

This research set to investigate how teams work for product innovation in family controlled manufacturing firms and to develop a framework of their teamwork patterns. The objective of the study is to use a cultural insider view to gain in-depth understandings of the psychologies/mentalities of working and doing innovation in these teams.

Research methodology

In order to gain in-depth understandings of how team members interact and work within CFB teams, I have to conduct one-to-one interviews with each individual team members in your NPD teams. The interviews mainly cover six key areas:

1. team structure and management
2. processes of product development or teamwork for innovation

processes

3. work distribution and responsibilities
4. idea generation, decision-making and implementation of decisions in teams
5. team member participation and interaction
6. communications within team

Each interview will last around one hour and the interviews will be recorded for subsequent data analysis. I hope you'll agree to the recording of the interview. If necessary, I can provide you with the audio file and the transcript of the interview. Of course, this audio file will be given to you only, and no one else besides you and me will have access to the file or the transcript. Your identity will be concealed in my report and your statement will be presented with codes. Thus your opinions or experience will be presented anonymously in the reports. Please do not worry about the confidentiality of your identity or opinions.

Feedback:

All the interviews will be restricted to academic purposes (including a doctoral thesis and academic journal papers). If you are willing to participate, I will provide a feedback report as well as a copy of my doctoral thesis as a token of my gratitude. Many thanks for your kind support and participation.

Doctoral researcher: Min-Wen Sophie Chang e-mail:
changm@aston.ac.uk

Appendix 5: A checklist for CFB owners to assess their skills and attitudes towards managing R&D operations and NPD teams

Questions/Issues	Yes	No
Do you have the right technical skills and technical competence to manage product innovation?	<ul style="list-style-type: none"> • List your own technical experience/competence • List the technology, technical competence and know-how needed to develop new products. • Compare the two to see whether you really have the right technical skill sets needed. 	<ul style="list-style-type: none"> • Is there anyone with the right technical competence needed for managing R&D operations within the firm? • If there is no internal candidate, consider possible external candidates/external consultants. E.g. who has the right technical skill set and is willing to help?
Do you have the necessary project management skills to run complicated NPD projects?	<p style="text-align: center;">Yes</p> <ul style="list-style-type: none"> • List your 'project management skills.' • Consult professional project management managers or academic scholars regarding project management skills needed for managing complex product innovation. • Compare the two to see whether you have the right project management skills to manage R&D projects. 	<p style="text-align: center;">No</p> <ul style="list-style-type: none"> • Look into the in-house talent pool to see if anyone in the firm has project management skills, such as a project management certificate rewarded by the Project Management Institute (PMI). • Consider sending your R&D director or young talent on project management courses to obtain PMI certificates. • If there is no appropriate in-house candidate, consider possible external candidates such as professional consultants with PMI certificates.

Question/Issues	Yes	No
<p>Do you want to use the management of product innovation as a tool to reinforce control over R&D operations?</p>	<ul style="list-style-type: none"> • What would be the benefits if you managed product innovation by yourself? • Can controlling the management of an R&D operation really help you to retain technical competence within the hands of family executives? • What would be the possible benefits and drawbacks if you managed product innovation by yourself? 	<ul style="list-style-type: none"> • How do you perceive the management of your in-house R&D activities? • If you do not wish to manage product innovation by yourself, who will be doing it? • Would you be able to retain subject experts & R&D experts within the firm? • If no family members are involved in the management of product innovation, what control mechanisms are you using in order to ensure the development of new products follows the right track?
<p>Are you willing to appoint a non-family R&D director and empower him to make key R&D decisions?</p>	<p style="text-align: center;">Yes</p> <ul style="list-style-type: none"> • Does the non-family R&D director have the right sort of technical competence, experience and project management skills needed for managing an R&D operation and NPD projects? • As top executives, do you want to participate in the management of the R&D operation in order to reinforce control? • If the R&D director is allowed to make key R&D decisions without having to consult the owners, can control mechanisms be used to safeguard against the agency problem? 	<p style="text-align: center;">No</p> <ul style="list-style-type: none"> • Consider why you are reluctant to appoint and empower a non-family R&D director. Are you worried that the firm's technical competence may be lost if a non-family director runs the R&D operation? • Do you or members of your family have the right sort of competences needed for managing R&D? <p>If you decide to retain total control, how much power and resources will be given to non-family R&D managers/personnel?</p>