
Advancing Tacit Knowledge: Malaysian Family SMEs in Manufacturing

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Abstract

The family business literature in developing countries suggests that their organizational features inhibit innovations that create niche products. In industrializing Malaysia, where family small- and medium-scale enterprises (SMEs) are undergoing a generational shift, there is little research on their capacity to develop the tacit knowledge of the founding generation. This assessment of 29 thriving family SMEs in plastics and food manufacturing evaluates how a new generation has nurtured innovative management, manufacturing, and marketing techniques. By adopting a business history approach that appraises the development of tacit knowledge, this study validates the need for family SMEs to institute organizational reforms to codify knowledge and therefore ensure long-term sustainability.

I. Introduction

About 80 percent of Malaysia's businesses are reputedly family-owned and a majority of them function as small- and medium-scale enterprises (SMEs)¹ with an active presence in manufacturing, trading, and retailing (Draim 2001). The World Bank estimates that family firms own

¹ The Malaysian government defines a small manufacturing firm as one with a sales turnover of between RM 250,000 and RM 10 million or one that has between 5 and 50 full-time employees. A medium-scale firm is one with a sales turnover of RM 10–25 million or between 51 and 150 full-time employees (SME Information and Advisory Centre; retrieved 25 August 2009 from <http://www.smidec.gov.my>). These definitions are used here, though firms with more than 150 employees are classified as large-sized family SMEs. In May 2013, the exchange rate of the local currency, the ringgit, to the U.S. dollar was RM 3.03 = US\$ 1.

67.2 percent of the equity quoted on the Bursa Malaysia, the domestic stock exchange. The second generation manages 30 percent of these SMEs and publicly listed firms (Jasani 2002), and a large segment of the remaining 70 percent will be subjected to a generational shift in the near future.

Because only one-third of family firms survive into the second generation, and few carry over into the third generation (Aronoff and Ward 1995), this impending generational transition could have a significant impact on the domestic economy given Malaysia's large volume of family firms. The literature on family firms, however, also indicates that the conduct of a family firm can alter considerably when a new generation takes control, leading to the rise of highly innovative enterprises that have built on the tacit knowledge of the founding generation (Swinth and Vinton 1993). Important organizational changes within family firms that contribute to their rise as large enterprises include promoting research and product development and inducting outsiders as members of management (Soderquist, Chanaron, and Motwani 1997). Business historians note that the decline or demise of family firms is attributable to the owners' slow recognition of research and development (R&D) to nurture innovations that enhance the quality of their products (Chandler 1962; 1977).

In Malaysia, a family firm's key features, such as the mode of enterprise development adopted by its founder (and his/her successors) and its capacity to function as a learning enterprise that can transform tacit knowledge to codified forms, shape its organizational structure. Although there has been a perceptible increase in the adoption of western management techniques among family firms with the passing of the founder generation,² an SME's capacity to institute requisite changes to stay ahead of the curve has also been influenced by important external factors. These factors include the pace of technological change, a problem the older generation did not encounter with as great intensity. Manufacturing is losing ground as a major contributor to the Malaysian economy as firms struggle to shift from low value-added labor-intensive production to high value-added skill-intensive and technology-intensive manufacturing (Rasiah 2003).

This is an important concern for two reasons. First, a large number of family SMEs are in manufacturing. Second, it is imperative that technology-related investments are increased to foster R&D activities to innovate. However, R&D expenditure constitutes only 0.9 percent of Malaysia's GDP. In most industrialized countries, total R&D expenditure is at least two percent of GDP.

² For a discussion on changes within Chinese-owned family firms following a generational change, see Gomez (2007).

In the 1960s, most SMEs were involved in manufacturing, supplying goods to large domestic firms and multinational companies (MNCs). Because most family SMEs lacked the capital, technical know-how, and managerial nous to compete with MNCs, they remained small-scale with only a few large enterprises emerging with a key presence in manufacturing (Gomez 1999). Another reason for limited upgrading among SMEs is that, as numerous studies on innovation have indicated, linkages between industries and research organizations are fundamental for successful commercialization of tacit knowledge (see, for example, Hagedoorn, Link, and Vonortas 2000). There is scant evidence of university–industry ties in Malaysia involving collaborative research or joint ventures (Rasiah 2003).

These are problems of enormous implications as the goal of nurturing domestic SMEs through consistent internal expansion is a key national objective of the Malaysian government. Domestic SME development can increase employment, generate economic growth, create local value-added, and improve national innovation and entrepreneurial capabilities.

2. Literature review, conceptual framework, and methodology

Malaysian business studies have focused primarily on the mode of enterprise development, ownership and control patterns, and the links between these issues and processes of structural change and economic development (Sieh 1982; Tan 1982; Gomez 1999). This literature has been able to explain the reasons for the growth of large firms, but it has failed to assess the managerial and organizational structure of Malaysia's leading SMEs. Scant attention, if any, has been given to organizational and managerial patterns within family SMEs despite the fact that they constitute a huge segment of Malaysia's corporate sector.

In the family business literature, the issue of succession features prominently, concentrating primarily on how the founders built the firm before passing it on to the next generation (Dyer 1986). In this literature, Dyer's (1986) model of a family firm's four-stage life cycle is relevant with its focus on the creation of the business, its pattern of development, the handover to the second generation, and public ownership and professional management. One core concern following a generational change is whether this altered strategic behavior leads to significant shifts in the firm's mode of management, marketing, and manufacturing, known as the 3Ms (Chandler 1962; 1977). This reference to the 3Ms suggests that family SMEs can counter market competition by enhancing "organizational capabilities" to keep abreast with rapid changes within the industry (Chandler 1962). Organizational capabilities can be improved if a firm evolves from a hierarchical-based organization to one with a flattened structure that encourages the flow of innovative ideas (Dyer and

Handler 1994). Reforms to improve organizational capabilities would necessitate investing in R&D and identifying new markets to expand the customer base (Chandler 1962; 1977).

Writing within the tradition of business history, Alfred Chandler, Jr., has done most to reveal that to understand a firm's capacity to innovate one must review its organizational and managerial aspects. Chandler (1962; 1977) uses the 3Ms concept to trace how an SME can overcome the advantage that first-movers have, specifically, by developing organizational capabilities to rectify or introduce new mechanisms to augment innovation and increase market share of its products. Chandler's (1962) concept of "administrative coordination" draws crucial attention to the need to professionalize a company's management to avoid institutional failure. Galambos (1970), in the Chandlerian tradition, stresses the importance of "organizational synthesis," with the emergence of the modern, multidivisional corporation. Research in this tradition cogently discloses that the growth of modern industry is not merely due to the quality of a company's management and its ability to access capital, but also whether it can upgrade its technology for mass production and enhance the distribution of its products (Chandler 1977).

In the Schumpeterian tradition, innovation capacity has a five-fold dimension, involving a firm's capacity to constantly introduce new products, sources of supply, production methods, markets, and forms of organization (Hult, Hurley, and Knight 2004). R&D is seen as crucial because the effective upgrading of skills and knowledge are potential catalysts for innovations that lead to better products. Customer proximity to keep pace with market changes would encourage constant improvement of products. To ensure beneficial outcomes from R&D investments, a degree of flexibility is required in the firm's organizational form, such as open channels of communication and informal decision making about technical change (Craig and Dibrell 2006). In this regard, family involvement in a firm may be positively related to R&D intensity.

Multi-generational family firms, by definition, refer to a group of people in an enterprise who are conditioned by their shared history and their exposure to a common set of formative events and trends, a key factor that determines decision making (Westhead 2003). As they grow older, the family management does not radically change the way they view the world, unless important organizational and administrative changes are introduced. To link tacit knowledge, organizational capabilities, and administrative coordination coherently to keep abreast with changing market demands, ownership and control patterns matter. This study's empirical evidence will indicate that a focus on the 3Ms is vital if a founder's tacit knowledge is to

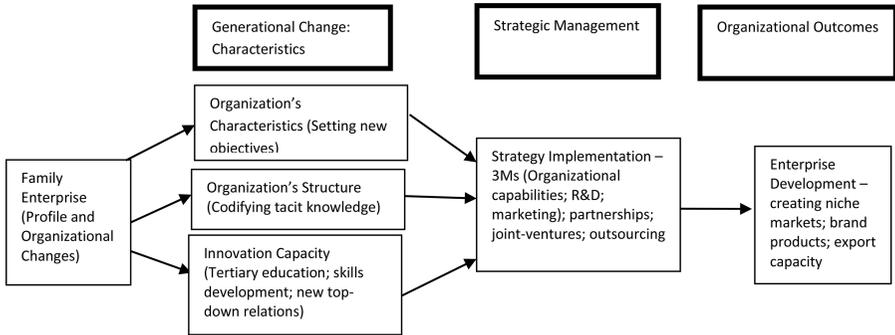
be cultivated, by nurturing organizational capabilities (through R&D) and by strengthening administrative coordination down to the shop floor (through new managerial techniques).

R&D is imperative to nurture tacit knowledge through innovation. That tacit knowledge cannot be formalized in explicit forms without loss of authenticity, however. Other studies contend that instead of striving to make tacit knowledge explicit, the emphasis should be on making the implicit available (Glisby and Holden 2003). Caron (2005) adds the vital point that innovation constitutes not a dramatic reform but a process of gradual adjustments in response to socioeconomic changes. Scranton (1997) similarly argues that an enterprise's growth depends not merely on its technical competence but its close attention to market changes and the adeptness of its workforce to solve problems and react quickly to the changing trends of its customers, a process that suggests that tacit knowledge can be used in various forms.

Research on family firms indicates the need to conceive a conceptual framework that integrates an assessment of key issues including characteristics of family history such as expertise and education (Davis and Harveston 2000); the new generation's capacity to convert the founder's tacit knowledge to a codified form that can lead to brand name products, spin-offs, or niche markets; and the construction of an organizational structure that facilitates and nurtures innovation (Hadjimanolis 2000). In this study, generational change is assessed based on a firm's performance in three core areas, that is the organization's characteristics (objectives), its structure (marketing, management, and manufacturing), and its innovation capacity (education, skills development, top-down relations, promotion of innovation). These areas are crucial features of strategic planning that can lead to enterprise development. This conceptual framework is presented in Figure 1.

An extensive survey was conducted of family firms in Malaysia's manufacturing sector to identify companies that had sustained themselves following at least one generational change by enhancing their organizational capabilities, involving investment in R&D; by improving administrative coordination to facilitate innovation; and by increasing their market share by cultivating a new customer base. A core concern during this survey was whether the family firm had built on the founder's tacit knowledge by developing goods of a higher quality or by creating spin-offs that were producing a new range of products. This survey focused on plastics and food production firms as they constituted the largest segment of manufacturing enterprises and are still seen as economic growth areas. The two industries, however, have to deal with a different set of problems that could impair their longevity, which

Figure 1. Conceptual framework of family firms, generational change, and enterprise development



Source: Chandler 1962, 1977; Hadjimanolis 2000; Davis and Harroston 2000.

raises important business questions about R&D, organizational and management structure, and product development. A comparison of plastics and food production was expected to elicit crucial insights, specifically the innovation capacity to effectively codify tacit knowledge that had resulted in brand products. The SMEs selected for analysis were those where one family had majority equity ownership with at least one of its members on the management board. The firms chosen for assessment were those under the management of a second, third, or fourth generation. Based on these criteria, 29 SMEs were assessed; 11 in the plastics industry and the rest in food production. We reviewed 116 questionnaires from the senior management of these 29 firms—a response rate of 80 percent—before interviews were conducted.

3. Family firms in the plastics and food production sectors

In the 1960s, Malaysian companies involved in the production of plastics-related ware numbered less than 100, predominantly small-scale operators catering only to the domestic market (Khairuddin and Yeoh 1986). The plastics manufacturing industry's first census in 1959 revealed that a majority of its products were household and consumer items, films, and bags. The number of firms in this sector rose rapidly to about 400 in the late 1970s due to the economy's rapid expansion, a majority of them family SMEs.

When import-substituting industrialization was encouraged after Independence in 1957, through a combination of infrastructure investments and fiscal incentives, the

primary beneficiaries of these policies were MNCs. In the 1960s, foreign direct investment constituted 50 percent of total investment in manufacturing. The growing presence of MNCs created domestic demand for plastics-based products, including an increased need for high-quality precision parts, primarily to feed the burgeoning electrical and electronics industry. It was, however, only after the government introduced its export-oriented industrialization growth model in the mid 1960s that the number of SMEs in manufacturing began to rise, primarily by catering to MNCs. By the turn of the century, with the emergence of lower-cost economies in Asia such as China and Vietnam, whose companies were also involved in the plastics industry, Malaysian SMEs in this sector were compelled to re-think and re-strategize their business development plans. This involved upgrading, including through R&D, to produce higher-quality manufactured products. In other cases, family SMEs diversified their range of products to deal with growing competition, domestically as well as globally.

In food manufacturing, the longevity of some family SMEs has been quite remarkable, because of their capacity to adapt their products to suit the changing tastes of a multiethnic society in transition due to rapid modernization. The agri-food and food and drink processing industries are Malaysia's fourth largest manufacturing industry sector, after the electronic components, oil refining, and IT products sectors. The total number of firms in food processing in 2011 was 6,069, of which 98 percent were SMEs. Processed foods are exported to more than 80 countries, with an annual export value of more than RM 6 billion, amounting to two-thirds of total Malaysian food exports.

As income per capita grew, lifestyle changes altered food consumption habits with growing demand for more nutritious and higher quality products. Malaysia's daily baked products industry, for example, has registered an increase in new products, new investments, and new concept launches that have contributed to massive sales growth. There is growing consumption of products that are easy-to-cook, ready-to-eat, and halal. Growing international demand for halal food has created much potential for firms in this sector to expand their markets globally. Malaysia's food processing industry has shown the capacity to compete with imports in the local market as foreign competitors have found it difficult to match domestic prices and the local flavors of domestic brands (Khairuddin and Yeoh 1986).

4. Food versus plastics production: Tacit knowledge and longevity

Tables 1 and 2 present key features of 29 second-, third-, and fourth-generation family SMEs involved in the manufacturing of food and beverages and plastics

Table 1. Food manufacturing family firms across generations: Profile and organizational changes

Family enterprises / business nature	Year incorporated / generation	Annual sales (RM million)	Number of employees	Number of family members	Number of managers	Number of branches / outlets	Number of pieces of equipment	Number of new products
1. Eu Yan Sang (Chinese herbs)	1842 3rd	1-500	30-600	20-100	3-50	1-200	1-179	+150
2. Khong Guan (Biscuits)	1937 3rd	2-330	25-450	10-130	5-28	1-21	2-185	+80
3. London Biscuit (Biscuits)	1994 2nd	10-100	50-470	5-40	5-40	1-5	2-50	+60
4. Tatawa Industries (Biscuits)	1981 2nd	5-39	20-200	6-50	4-40	1-2	1-30	+50
5. Amoy Canning (Food & drinks)	1860 3rd	2-30	20-500	20-50	3-20	1-4	3-20	+90
6. Laksamana Usaha (Noodles)	1975 2nd	1-30	10-120	8-40	2-10	0	2-20	+30
7. TPC Plus (Eggs)	1976 2nd	5-28	20-330	5-35	2-8	0	2-18	+5
8. Vit Makaman (Noodles)	1975 2nd	2-25	15-300	8-67	2-10	0	8-170	+30
9. Besfomec (Chinese herbs)	1948 3rd	1-20	8-180	8-60	3-11	1-3	2-45	+40
10. King's Confectionery (Cakes & breads)	1977 2nd	1-20	10-320	9-70	2-15	1-80	5-230	+80
11. Baker's Cottage (Cakes & breads)	1994 3rd	2-19	20-110	10-30	3-7	1-30	8-180	+55
12. Ghee Hiang (Sesame oil & biscuits)	1865 4th	0.5-18	8-105	20-55	2-10	1-3	3-20	+40
13. Khun Thim Food (Soy sauce)	1970 2nd	1-15	30-50	10-35	1-7	1-3	5-15	+47
14. KLT Food Industries (Restaurant)	1972 2nd	1-8	5-100	8-58	3-20	1-6	1-10	+25
15. Red Horse (Cordials)	1964 2nd	0.3-8	6-100	10-18	2-5	1-3	3-12	+20

16. Hei Hwang (Coffee)	1975 2nd	0.7-6	10-30	8-15	2-7	1-2	2-30	+30
17. Eng Hup Seng (Sesame oil)	1987 2nd	0.2-5	5-25	3-10	2-7	0	2-38	+33
18. Regent Food (Peanuts)	1981 2nd	0.2-4	5-50	6-10	2-5	0	2-8	+19

Source: Company records filed annually, from the time of incorporation, with the Malaysian government's Registrar of Companies.

Table 2. Plastics manufacturing family SMEs across generations: Profile and organizational changes

Plastic enterprises / business nature	Year incorporated / generation	Annual sales (RM million)	Number of employees	Number of family members	Number of managers	Number of subsidiaries	Number of pieces of equipment	Number of new products
1. SKP Resources (Plastic injection)	1974 2nd	10-255	100-2000	3-90	5-50	1-6	7-200	+150
2. Bina Plastic (PVC pipes)	1980 2nd	8-172	100-500	2-80	3-12	1-2	2-50	+120
3. Guppy Plastic (Aquarium & plastic injection)	1970 2nd	5-115	50-700	3-40	5-40	1-5	3-100	+130
4. Chang Huat (Plastic injection)	1988 2nd	5-86	50-400	2-30	4-40	1-6	4-150	+90
5. Lee Huat Plastic (Housewares)	1947 3rd	2-58	20-600	3-20	3-10	1-4	3-80	+110
6. Polynic Industries (Plastic injection)	1977 2nd	5-55	15-60	3-10	2-8	1-2	2-25	+70
7. Lam Seng Plastic (Container & plastic injection)	1967 2nd	5-45	20-330	2-10	2-20	1-7	4-110	+90
8. Kemajuan Plastic (Carrier tape)	1973 2nd	2-38	20-110	2-20	3-10	1-3	3-50	+50
9. Yew Lee (Broom & brush)	1970 2nd	2-18	5-70	2-10	2-6	1-2	3-20	+80
10. Cemerlang Raya (Broom & brush)	1987 2nd	1-5	5-100	2-10	2-5	None	3-10	+48
11. Sweetco (PVC canvas)	1929 3rd	0.5-1.5	30-50	2-8	1-5	1-4	5-10	+20

Source: Company records filed annually, from the time of incorporation, with the Malaysian government's Registrar of Companies.

products, respectively. These tables trace organizational changes occurring across generations, in terms of number branches, managers, employees, and equipment. These tables also disclose increasing investments in equipment, which contributed to new products and growing annual sales.

These tables draw attention to a crucial point: the growing number of family members in the enterprise across generations, indicating the absorption of new generations into these SMEs. These SMEs had incorporated a number of subsidiaries to include new members into the family enterprise. This cohort from the second, third, and fourth generations constituted family members with much higher learning than the founders, evidence of investment in human capital development by these firms.³ An outcome of such investment, however, was that this well-educated generation was prone to questioning what they saw as archaic patterns of production.⁴ These two tables further reveal a high number of new products produced across generations, a factor related to the education level of each succeeding generation that contributed to another key point in Tables 1 and 2: growing investments in equipment. Such capital investments suggest a desire to promote R&D to improve the quality and range of their products, a fact confirmed during interviews with the executives of these firms.⁵

A key point emerging from a comparison of Tables 1 and 2 is that nearly one-third of the 18 family enterprises in food production were established in the mid nineteenth and early twentieth centuries. Only two of the 11 firms in plastics manufacturing were formed before 1950, exposing cogently the difficulty in sustaining plastics-based firms over a long period. This is significant because the volume of investments in plastics-products manufacturing is far higher than that required for food

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- 3 During interviews with second, third, and fourth generation members, 9 out of 11 people in plastics manufacturing firms and 15 out of 18 in food production had received higher education in disciplines such as engineering, management, pharmacy, and food science.
 - 4 During interviews with executives of these manufacturing firms, members of 7 of the 11 companies in the plastics sector and 13 of the 18 in food production contended that if they had innovated earlier, to dispense with archaic production methods, their enterprises would have been well ahead of the competition in terms of new product development, also contributing to economic development.
 - 5 During interviews with senior management of these family SMEs, there was much reference to the importance of R&D. Polynic Industries promoted R&D in renewable energy as part of its desire to reduce costs in plastic production (interview on 3 September 2011). Tatawa Industries introduced R&D in food technology to enhance its range of markets abroad (interview on 19 October 2011). Kemajuan Plastic invested heavily in R&D to improve the quality of its carrier tapes (interview on 12 November 2011). These executives disclosed that the use of R&D to enhance production and marketing techniques was only implemented after the founder had relinquished involvement in the business.

production. Crucially, too, company records indicate that the rapid growth of plastics-related firms occurred primarily during the 1970s and early 1980s, due to the boom in the electronics and electrical sector, which contributed to the upgrading of products to meet the changing needs of customers. Food-related firms, on the other hand, have shown consistent growth across generations by investing in product development and by ensuring that tacit knowledge was codified in different forms. In virtually all of the plastics manufacturing firms, although their founders' tacit knowledge led to their early development, they would eventually evolve by producing goods far different from their original product.

The responses from the questionnaires confirm that the key reason why these 29 SMEs had survived the test of time—the age of these firms ranged from 82 to 169 years—was because family members had, through R&D, developed expertise in what they had been manufacturing. These SMEs' founders were privy to a particular type of knowledge that had enabled them to build an enterprise that was different from their competitors. The second generation had transformed this tacit knowledge into more explicit forms that helped increase the range of products and production rates in their respective sectors. In terms of marketing, the second generation promoted their products as superior brands to create a niche for themselves.

There were fundamental differences between firms in the food and plastics industries. The food trademark and brand names had become a major factor for the longevity of these firms, as these products had emerged as well-known household fare, allowing them to develop and retain a huge client base.⁶ Plastics manufacturing enterprises, however, had built their reputation only after serving as subcontractors or vendors to MNCs such as Sony, Motorola, AMD, and Hitachi, usually delivering products far different from that produced by the founder.⁷ Second-generation enterprise owners, who had been privy to higher education, preferred to encourage organizational capabilities that built on the quality of the products produced, a factor that eventually allowed them to become suppliers to MNCs, learn from this link, and develop their own technological capacity through R&D.

A comparison of these two tables—as well as an in-depth assessment of these SMEs' annual reports filed with the government's Registrar of Companies—further indicates that the food manufacturers have shown a greater proclivity to enforce a

6 This brand recognition is evident in the national awards won by these food firms. For example, in 2012 Eu Yang Sang won the Malaysia Putra brand award in the health category and KLT Food Industries won the Malaysia Super Brand award in the mooncake category in 2003.

7 For example, Guppy Plastic was formerly known as the Gombak Fish Farm and Kemajuan Plastic was incorporated as Heng Sang Metal Works.

managerial system that served to challenge dominant paternal systems.⁸ This trend towards the introduction of new management techniques to foster innovation contributed to product development,⁹ and the growing sales volume is an indication of wide distribution of their products. Those who have acquired modern technology and increased the number of their managers were large-scale family firms, in terms of number of employees, specifically those that had started out by dealing in herbs for Chinese immigrants, biscuits for British merchants, and food stuffs and beverages for local customers. This suggests an important emphasis on the 3Ms by SMEs in the food industry, compared with those in plastics manufacturing, primarily to develop their founders' tacit knowledge.

Amoy Canning, for example, developed a formidable reputation as a manufacturer and distributor of high quality Asian food and beverages through labels such as Delite, Amocan, and Amofood. Founded by the Ng family in 1860, one reason for this firm's rise was the founder's foresight, in 1913, to hire an American named Kroch when establishing a canning factory in Xiamen to secure a transfer of technology in production processes. This firm now has two branches—one in Kuala Lumpur and another in Singapore. Besfomec also built on its founder's tacit knowledge, starting out as a Chinese herbs producer in 1948, before venturing into health supplements, specifically essence products. Besfomec has created a reputable brand that distributes products in various forms such as Traditional Essence of Chicken, Fish with Wild Ginseng, and Bird's Nest with Rock Sugar. The firm invested heavily in plant and equipment and by 2011 had a production capacity of 60,000 bottles of essence products per day.

5. Generational change, the 3Ms, and enterprise development

Table 3 presents how generational change has shaped the 3Ms and the impact this has had on the 29 SMEs based on their size (i.e., between large-, medium-, and small-scale enterprises), with size determined in terms of number of employees.¹⁰ The first generation in both the food and plastics industries was strongly associated with closely held equity ownership and control over decision making. The founders had centralized management to determine these firms' objectives and how manufacturing and marketing techniques were to be developed. These firms' business

⁸ This point was confirmed during the interviews with these firms' senior managers.

⁹ A point noted during interviews with L. H. Wong of King's Confectionery, C. P. Low of Besfomec Industries, and S. L. Mun of Khum Thim Food.

¹⁰ As mentioned in footnote 1, SMEs with more than 150 employees were classified as large-scale enterprises.

Table 3. Effect of generational change on tacit knowledge, 3Ms, and organizational outcomes

Size of firm	Organizational structure (3Ms)	Strategy management	Organizational outcomes
Large-scale firms Plastics (SKP Resources and Chang Huat)	First generation Marketing: Distribution mainly targeted at government agencies and MNCs. Manufacturing: Equipped with 1–10 machines to produce solely for domestic market.	First generation Strategy: Heavily enhances organizational capabilities as one-stop solution and supply center that caters to a broad, predominantly domestic clientele.	First generation Enterprise Development: Consistently acquired new premises and established subsidiaries.
	Food (London Biscuit, Khong Guan, Amoy Canning, Eu Yan Sang, Baker's Cottage, TPC Plus)	Subsequent generations Marketing: Diversifies activities to increase customer base. Manufacturing: Equipped with 100–200 machines to produce for domestic and overseas markets. Management: Family controls top management but begins incorporating professional managers to promote organizational flexibility and develop tacit knowledge.	Subsequent generations Enterprise Development: Efficient administrative coordination, constantly upgrading, keeps abreast with technological advancement, thus enhancing production capabilities.
Medium-scale firms Plastics (Bina Plastic, Kemajuan Plastic, Guppy Plastic, Lam Seng Plastic, Lee Huat Plastic)	First generation Marketing: Distribution focus: long-term orientation and mainly targeted at particular clientele. Manufacturing: Equipped with 1–2 machines producing simple products catering solely to domestic market. Management: Family members, usually with founder, handle daily managerial tasks.	First generation Strategy: As pioneer, moderately promotes organizational capabilities and 3Ms to develop domestic and foreign clientele base.	First generation Enterprise Development: Frequently acquired new premises and established subsidiaries.
	Food (Tatawa Industries, Ghee Hiang, King's Confectionery, Kum Lun Tai, Laksamana Usaha, Vit Makanan, Bes(fomec)	Subsequent generation Marketing: New distribution channels created and new product designs introduced to keep pace with changing market. Manufacturing: Equipped with 10–50 machines to cater to local market, though starts focusing on export activities. Management: Family handles managerial tasks and each department controlled by its members to protect tacit knowledge.	Subsequent generation Strategy: Moderately involved in R&D to innovate tacit knowledge, professionalizes management, and improves production capabilities to facilitate product design modifications to suit customers' needs.
Small-scale firms Plastics (Polynic Industries, Cemerlang Raya, Sweetco Enterprise, Yew Lee)	First generation Marketing: Distribution channel mainly targets end-users, and thus monitors consumer behavior. Manufacturing: Ill-equipped with up-to-date machines and focuses only on meeting requests by customers. Management: Led by husband and wife, while children handle daily tasks. Some attempt to promote organizational flexibilities.	First generation Strategy: Less likely to promote organizational capabilities but starts introducing manufacturing protocols where every staff follows rules and regulations aligned with vision.	First generation Enterprise Development: Less likely to acquire new premises or establish subsidiaries. Prefers using main branch to implement new manufacturing processes. Focuses on retaining old customers.
	Food (Red Horse, Hei Hwang, Regent Food, Eng Hup Seng, Khum Thim Food)	Subsequent generation Marketing: Distribution channels mainly target end-users and clients recommended by previous customers. Manufacturing: Equipped with 1–6 machines producing for local market and modifies products based on globalized trends. Management: Family members improve managerial tasks but no significant focus on increasing organizational flexibilities.	Subsequent generation Enterprise Development: Unlikely to upgrade, though strongly influenced by 3Ms, keeps abreast with technological advancements.

histories indicate that the founders' heirs, after they had acquired tertiary education, felt the need to assume the role of the decision maker about whether to create new distribution channels (marketing), who to hire (management), and what new products were needed and when to upgrade production facilities (manufacturing). Differences between generations about managerial styles would influence strategic planning that had a bearing on organizational outcomes.¹¹ Such differences were particularly evident if the founder had not fully retired, though he had relinquished control to the second generation.

The second generation often came on board as senior managers by birthright in companies such as Kemajuan Plastic, SKP Resources, Cemerlang Raya, Polynic Industries, Khum Thim Food, Regent Food, London Biscuits, and KLT Food when the aging founders felt the need to pass the leadership to them. Most of these 29 founding members were reluctant to give the second generation free reign to institute major changes, however, due to fear of losing what they had built. The second generation, on assuming leadership, though in evident awe of the founders' accomplishments, played a key role in changing or fine tuning these firms' objectives, including determining how to develop key aspects of the 3Ms to enhance innovation. All 29 SMEs would attempt to actively engage in the process of transforming tacit knowledge to a codified form.¹²

This leadership change had a bearing on managerial style, with organizational reforms introduced to incorporate a professional management and to adopt a consultative decision-making style. Second generation leaders, though keen to professionalize the management and introduce R&D to upgrade their products, were more

¹¹ The reluctance of these firms to change their organizational, production, and management structures was overcome following a generational shift, a key factor that contributed to their development. Polynic Industries pioneered virtual R&D teams that developed energy-saving solutions; Bina Plastic created R&D teams to nurture sophisticated piping systems; King's Confectionery introduced outlet management teams to develop a well-structured business franchising system involved in bakeries and lifestyle cafes; and Regent Food established export management teams to improve their private labels to acquire a reputation in foreign markets.

¹² A review of the history of these firms, focusing particularly on epochal moments involving product development or change, provides evidence to substantiate this point. SKP Resources ventured from the manufacturing of household goods to producing plastic audio-visual products. Lee Huat Plastic started out as a bicycle parts manufacturer but is now involved in the design of housewares. London Biscuits was incorporated to manufacture corn snack products but is now involved in producing instant confectioneries. Tatawa Industries was first involved in producing traditional wedding cake products but now has diversified its range of products, producing also cookies and biscuits that are exported to a number of countries.

risk-averse about new ventures compared with the founders.¹³ Managerial decision making became more complex with the emergence of the third generation, given the growing number of family members, the so-called cousin consortium, in the enterprise.¹⁴ Allowing everyone to voice an opinion, to minimize conflict, often resulted in a delay in decision making.¹⁵

A comparison of the history of these 29 SMEs revealed that what had transpired during the second generation was most crucial for their future development. This was particularly true when determining how to develop tacit knowledge, including when deciding whether to diversify its range of products. A number of plastics manufacturers, such as Kemajuan Plastic, Lee Huat Plastic, Guppy Plastic, and Lam Seng Plastic, had to venture into the development of new products. Among food SMEs, Khum Thim Food, Ghee Hiang, and Hei Hwang changed the nature of the products produced.

It was large-scale family SMEs that most heavily developed organization capabilities and R&D. There were attempts to improve administrative coordination by implementing sound management practices to better foster innovative marketing strategies, and investments in new technologies were evident among firms such as Eu Yang Sang, London Biscuit, and SKP Resources.¹⁶ These initiatives were crucial as they helped cultivate a system within these enterprises that encouraged the dissemination of ideas.¹⁷

Because marketing targets had become more globalized and customer requirements kept changing, most family SMEs had to adopt well-structured manufacturing and marketing techniques as well as conduct R&D to facilitate the development of new products. This was evident among plastics-based enterprises such as Guppy Plastic, Cemerlang Raya, and Lee Huat Plastic, where their tacit knowledge was configured to suit the needs of their customers. Among food enterprises, Ghee

13 Ken Khor (Polynic Industries' CEO), C. L. Tan (Laksamana Usaha's CEO), and H. H. Lee (Hei Hwang's CEO) indicated that they were risk-averse.

14 In Lee Huat Plastic (third generation) and Ghee Hiang (fourth generation), cousins were actively involved in management.

15 Interview with fourth-generation Carlyn Chen of Lee Huat Plastic.

16 Interview with S. S. Wong (Senior Marketing Manager), Tatawa Industries. Interview with Ann Lee (Customer Service, Khum Thim Food). Interview with S. O. Kin (CEO, Bina Plastic). Interview with Tan J. Shyong (Marketing CEO, Cemerlang Raya).

17 This point was well noted by Gan Poh Ling, a family member and director of one of the largest family enterprises, SKP Resources. According to Gan: "The key factor for any successful company is a strong head. Although there are family members involved, this is no 'Chinaman family-styled company.' All our managers are professionals."

Hiang, Besfomec, and Hei Hwang were especially astute in terms of commercializing tacit knowledge as products that appealed to the taste of customers at particular moments in time. Local snack food manufacturers London Biscuit, Khong Guan, Regent Food, and Tatawa Industries concentrated on creating brand products comprising both western and oriental varieties. Their second generation went on to market their products as superior brands, further penetrating the market, even establishing a niche for themselves.¹⁸

6. Firm size and enterprise development

Table 4 presents the outcome of generational change on the capacity of large-, medium-, and small-scale firms to innovate in a fashion that contributed to their development. This table indicates that medium-scale firms developed manufacturing capacity most quickly, due to a strong emphasis on innovation, by investing in R&D to create products that looked different from one generation to the next. The second generation and those that followed had fared better compared with the founder as the latter had problems overcoming cash flow problems. With capital accumulation and knowledge gained from experience, medium-scale SMEs were able to achieve recognition in terms of the reputé of their products. To attain this recognition, medium-scale SMEs had to induct a professional workforce to enhance the firm's management, administrative, and production systems. Duties were clearly delineated, allowing top managers to focus on strategic planning while middle managers saw to day-to-day activities. The second generation in medium-scale enterprises would enforce restructuring processes by adding value to products in response to changes in the market. New product development and technical training schemes were conducted to enhance the flow of innovative ideas to improve the manufacturing production chain.¹⁹

Tables 3 and 4, in conjunction with Tables 1 and 2, reveal a major finding: medium-scale SMEs recorded the highest growth in terms of annual sales, consistently registering growth from one generation to the next. Medium-scale SMEs achieved the highest growth in terms of number of employees, compared with small- and large-scale firms.

18 Ooi Sian Hian, a third-generation member of the Ooi family and CEO of Ghee Hiang, argued that "a Malaysian brand name was built over a period of nearly 150 years through careful nurturing, sound customer commitment, and experience. We pride ourselves in handing down our century-old recipes (from Fujian, China) and trademarks through freshly baked Tau Sar Pneath [green bean paste pastry]."

19 This point was well noted by Callum Chen, a director of Lee Huat Plastic, a third-generation family SME. According to Chen: "If we don't innovate, we will be out of business, and if we don't have staff candid enough to step forward and say the boss is wrong we are in trouble too."

Table 4. Impact of generational change on developing tacit knowledge through innovation

Size of family enterprise	Generational change and innovation capacity	Strategy management	Organizational outcome
<p>Large-scale firm</p> <p>Plastics (SKP Resources and Chang Huat)</p> <p>Food (London, Khong Guan, Amoy Canning, Eu Yan Sang, Baker's Cottage, TPC Plus)</p>	<p>First generation Skill: Interprets and adopts foreign technology to develop tacit knowledge.</p> <p>Top-down: Top management leads teams aligned with company objectives.</p> <p>Innovation: Openness to ideas and accepts technology advancement.</p> <p>Involvement: Mostly family members and encourages career development; struggles to retain technical staff.</p> <p>Subsequent generations Skill: Interprets tacit knowledge differently, based on education received.</p> <p>Top-down: Top management gives autonomy to professional managers.</p> <p>Innovation: Openness to innovative ideas and incorporates globalized ideas into local culture.</p> <p>Involvement: Much family involvement, but no longer adheres strictly to founder's company culture.</p>	<p>First generation Strategy: Heavy family participation and finds suitable candidates to perform manufacturing process, but strongly relies on foreign technology.</p> <p>Subsequent generations Strategy: Heavily involved in extending innovation capacity to create and develop products based on tacit knowledge and increases production facilities.</p>	<p>First generation Enterprise development: Encourages diversification to develop new industries; enhances economies-of-scale.</p> <p>Subsequent generations Enterprise development: Promotes knowledge-based enterprise and heavily promotes entrepreneur dynamism in the organization.</p>
<p>Medium-scale family enterprise</p> <p>Plastics (Bina Plastic, Kemajuan Plastic, Guppy Plastic, Plastic Seng, Lee Huat Plastic)</p> <p>Food (Batava Industries, Chee Hiang, King's Confectionery, Kum Lun Tai, Laksamana Usaha, Vit Makanan, Besfomec)</p>	<p>First generation Skill: Interprets tacit knowledge in line with new technology; focuses on projects and production line.</p> <p>Top-down: Top management leads teams aligned with current project needs.</p> <p>Innovation: Openness to ideas, though accepts technology related to production only.</p> <p>Involvement: High family involvement in marketing, manufacturing, and management.</p> <p>Subsequent generations Skill: Interprets tacit knowledge from education received and implements jobs skillfully.</p> <p>Top-down: Autonomy given to managers to foster innovative ideas.</p> <p>Innovation: Openness to innovative ideas and adopts newest designs for current products.</p> <p>Involvement: Mostly family, but encourages non-members to join.</p>	<p>First generation Strategy: Frequent family participation and finds suitable partners to obtain more capital and resources to enhance production capabilities and increase business investments.</p> <p>Subsequent generations Strategy: Involved in extending innovation capacity to create and develop new products unless customers request that extra value is added to products.</p>	<p>First generation Enterprise development: Extends production line and creates different products based on tacit knowledge.</p> <p>Subsequent generations Enterprise development: Promotes brand reputation and continues upgrading quality and innovativeness to match current market needs.</p>

Table 4. (Continued)

Size of family enterprise	Generational change and innovation capacity	Strategy management	Organizational outcome
<p>Small-scale family enterprise Plastics (Polynic Industries, Cemerlang Raya, Sweetco Enterprise, Yew Lee)</p> <p>Food (Red Horse, Hei Hwang, Regent Food, Eng Hup Seng, Khum Thim Food)</p>	<p>First generation Skill: Interprets tacit knowledge in line with new technology; focuses on previous working experience. Top-down: Top management personally handles entire working task. Innovation: Openness to ideas, mainly serves purpose of increasing sales and profits. Involvement: High family involvement and performs same job as founder.</p>	<p>First generation Strategy: Compulsory to involve family. Starts training next generation to ensure they are familiar with business operation.</p>	<p>First generation Enterprise development: Extends and adds to production facilities and increases production scale, but remains at same stage of production.</p>
	<p>Subsequent generations Skill: Interprets experience from founder and passes skills across generations. Top-down: Top management replaced with younger staff to perform certain jobs. Innovation: Openness to ideas, to enhance efficiency and competitiveness. Involvement: High family involvement, but always encourages cross functional activities.</p>	<p>Subsequent generations Strategy: Involved in extending innovation capacity by maintaining good business relationships and starts plans for product development, building on tacit knowledge.</p>	<p>Subsequent generations Enterprise development: Less likely to add to production facilities but focuses on rebranding or strategizing business to rebuild the factory, upgrade and modernize machinery, and expand distribution channels.</p>

Small-scale SMEs achieved the least growth in terms of annual sales, registering slower growth rates from one generation to the next, a factor attributable to their investment in innovation and reform of their firms' organizational structure.

Tables 3 and 4 reveal that small-scale SMEs were less likely to promote the 3Ms and invest in R&D, even if they wanted to, primarily due to the exorbitant costs involved to acquire machinery and hire technically competent personnel to improve the quality of their products. These two tables indicate a strong effort to upgrade machinery across generations, though this was most common in medium-scale SMEs, a process that contributed to an increase in their customer base that expanded from the domestic arena to international markets. This conforms with Prais' (1976) argument that economies of scale are not dependent on firm size, but on plant size. Piore and Sable (1984) provided further evidence to substantiate this point, based on the example of small-scale industries in Europe, arguing that small firms were capable of being more responsive to market needs as they were far more flexible and better equipped for engendering and adopting innovations. Machine upgrading was extremely low among small SMEs, because investment in equipment was a huge expense and particularly risky in the case of plastics manufacturers. Small SMEs producing household products and requiring less-expensive machines were more prone to such capital investment. Some small SMEs did, however, increase their number of employees to diversify their range of products. For example, Yew Lee, Cemerlang Raya, and Sweetco invested in machine upgrading and increased their number of employees in an attempt to diversify their range of products.

Among large-scale companies, as Tables 3 indicates, there was more openness to the need to incorporate professional managers, including as members of the board of directors. Professional managers inducted into the firm typically had received formal training as engineers or in business schools, in areas such as finance, accounting, marketing, and personnel management. These executives were allowed sufficient autonomy to perform their duties, including to reform production and marketing techniques. The best performing firms, in terms of increasing volume of turnover, were those seen most open to the need to introduce the 3Ms. Large food firms such as Eu Yan Sang, London Biscuit, and Khong Guan increased their turnover after introducing the 3Ms following a generational shift. A similar trend was obvious among large plastics firms such as SKP Resources and Chang Huat. Among large-scale food manufacturers, a common trend was that they were active in opening retail outlets nationwide, as well as abroad in some cases, to increase sales volume. This was most common among confectionery and herb supplement SMEs such as King's Confectionery, Baker's Cottage, and Eu Yan Sang. More recently, franchising has been gaining momentum as an avenue to augment the volume of sales.

Previous studies argue that family members are not actively involved in small-scale SMEs, even in the case of Malaysian firms.²⁰ This study confirms that contention, as the involvement of family members in small-scale SMEs was low compared with larger enterprises. Family members were reluctant to join the firm because of the long working hours and routine job tasks; they also had limited capacity to express their talents and capabilities due to the hierarchical nature of the organization. One prominent example of this situation was Sweetco, a third-generation firm that had been in operation for about six decades. The owners preferred that their heirs sought out a career as professionals rather than work for the family firm, a core reason why Sweetco has remained a small-scale enterprise, though it had shown entrepreneurial capacity by developing a business (Maslino) in partnership with Koreans.²¹

The interviews revealed other factors that hindered the development of small SMEs. When the next generation had the ambition to develop their unproven ideas, they encountered the problem of the “generational shadow,” where the founder was reluctant to relinquish authority for fear of the consequences of major structural changes. Such changes included allowing for strangers to run the enterprise following the professionalization of the senior management. New employment and decision-making methods, such as flexible working hours and decentralized management, were frowned upon.

One major concern of the founder generation was the need to guard trade secrets, most evident among food-based firms that owned unique recipes. These firms’ founders were concerned that fundamental aspects of their tacit knowledge, even after it had been codified and developed through various products, could be learned by outsiders who would then venture into business and emerge as major competitors. Among plastics manufacturers, however, there was an urgent need to be open to new ideas as their customers preferred not only quality products but also value-added products. The founders, however, also feared that longstanding loyal customers, some for as long as five decades, would be concerned about the new managerial systems, production methods, and marketing techniques. It was not uncommon to hear of constant generational feuds over the need to review these firms’ strategies, practices, and production processes.²²

²⁰ For the case of Malaysia, see Gomez (2007).

²¹ Interview with Sweetco on 10 December 2011.

²² Interviews with Tan J. Shyong, Cemerlang Raya’s CEO (12 November 2011); Ken Khor, Polynic Industries’ CEO (3 September 2011); L. H. Hwang, Hei Hwang’s CEO (10 October 2011); and Tom Lim, Regent Food’s CEO (11 November 2011).

7. Conclusion

What proved most imperative for the sustainability of these 29 SMES was the process of codifying the founders' tacit knowledge productively by commercializing it. Innovation to improve the production process or increase the variety of products was key, and though not absent among the founding generation it was given new impetus when the second and third generations took control of these SMEs. These firms' ability to control the production of tacit knowledge gave them a competitive advantage that contributed to their growth. In all cases, efficient systems of production and methods of organization helped the process of codifying tacit knowledge, and administrative coordination enhanced competitive advantage, a process seen particularly among food firms.

The high-level education that subsequent generations were privy to, as well as their confidence to then incorporate professional managers, helped to codify tacit knowledge. How this tacit knowledge evolved to help an enterprise grow depended on the industry they were involved in. For firms in plastics manufacturing, diversification mattered (was even essential), and the tacit knowledge of the founders in most cases diminished in importance. For food production firms, the promotion of vertically integrated firms was imperative to produce a range of products emanating from the founders' tacit knowledge. In Besfomec Industries, for example, the ingredients for the production of its essence products were garnered from the knowledge of its founder, a physician. In King's Confectionery, the recipe for most of the products it now markets were adapted from the founder's mode of preparation of pastries that were produced during the colonial period for its British customers. Ghee Hiang's Baby Brand sesame oil and pastries are products developed from the recipes of its founder, a migrant from the Fujian province in China.

Strategic alliances mattered, primarily for plastics firms, though this was less important for food firms. Among plastics manufacturers, there was a more urgent need to adapt and to be more creative and inventive with their designs, and contractual ties with MNCs proved vital to sustain growth. The products manufactured by SKP Resources include audiovisual technology adapted from its collaboration with the foreign-based Pioneer Technology. Lee Huat Plastic went on to produce design-based housewares with ideas generated from its association with another foreign enterprise, Rubbermaid. Kemajuan Plastic improved its carrier-tape packaging process after it adopted ideas emerging from its association with ST Microelectronics.

These 29 case studies indicate that the second generation was most responsible for instituting the 3Ms, by implementing changes in the management of the

organization, by creating a new working culture, and by fostering R&D. Leaders of the third-generation firms relied on formal business education to guide their nurturing of an innovation culture. Companies such as Lee Huat Plastic, Besfomec, and Eu Yan Sang were able to leverage formal training to effectively propel the company forward. This business history approach indicates that the first generation usually showed great entrepreneurial capacity, the second generation was most responsible for organizational development and brand development, and the third generation would professionalize the firm, turning it in new directions to propel its growth. For example, the second generation in Cemerlang Raya (cleaning products) and King's Confectionery (bakeries) implemented major organizational changes to foster the 3Ms that facilitated the creation of brand products and a niche market for themselves. The third generation in Lee Huat Plastic, Ghee Hiang, and Eu Yang Sang successfully codified tacit knowledge through relevant strategic planning to improve efficiency as well as the quality and range of their products. This was primarily by utilizing R&D (though this was selectively and carefully done to protect trade secrets) by creating research ties with tertiary institutions. In all 29 SMEs, the explicit conversion of tacit knowledge through R&D was the factor that had sustained these enterprises across two or more generations.

When a generational change occurred, there were clear transitions in these firms' objectives, their organizational structure, and the way the 3Ms were developed. Whereas internal factors shaped the way the firm was structured, managed, and developed, their history draws attention to the fact that external factors such as the nature of public policies influenced innovation capacity and shaped the nature and extent of R&D. Economic conditions and policies did matter in each sector. A majority of these plastics manufacturers had humble beginnings, producing household ware, before creating sophisticated manufacturing facilities that produced a range of precision engineering plastic and plastic injection moldings. Public policies, including a shift to export-oriented industrialization, proved beneficial as it led to major evolutions in organizational structures and innovation capacities, involving how to allocate resources in new plants. This involved transforming and building on the founder's tacit knowledge, primarily through R&D, to generate products to match current needs and by supplying parts and accessories to MNCs.

Among food manufacturers, ready-to-eat food products offered much scope for expansion as this category emerged as the fastest growing manufacturing sector. Most of these SMEs (10 out of 18) were second-generation enterprises that were involved in ready-to-eat food products (biscuits, bakeries, and nuts) and ready-to-cook food products (noodles and sauces). The increasing global demand for snacks and ethnic food offered good export potential, with several of these local snack manufacturers,

such as Vit Makanan and Tatawa Industries, penetrating the export market. These two food-based SMEs work with the MNC Tesco to sell their products, locally and abroad.

This assessment of the histories of Malaysia's longstanding family SMEs in manufacturing indicates that the founders' tacit knowledge had been well deployed by the succeeding generations, indicating their ability to incorporate new technology. By institutionalizing innovation within production systems, these SMEs were able to utilize tacit knowledge productively to stimulate growth. With generational change, managerial hierarchies have become more embedded in these SMEs, though professional control structures have not become totally autonomous from ownership by these families.

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