

The Effects of an Age-Diverse Workforce on Innovation in Small and Medium-Sized Enterprises (SMEs) The Case of Singapore

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Abstract

Manufacturing continues to be an important pillar of Singapore's economy. In 2012, it contributed 21% to the city-state's total GDP of S\$345 billion. Like in other economic sectors, manufacturing firms need to adapt to different economic challenges in the external business environment in order to achieve long-term, sustainable growth. One of the enablers is the effective management of innovation (Davila et al. 2013). The term innovation refers to the implementation of a new or significantly improved product, service or process that meets/exceeds customers' needs at an affordable price. Examples include mobile phones with GIS map capabilities, digital marketing methods (social media), new organizational methods in business practices such as open innovation and so forth. Innovations can range from small incremental improvements such as Nabisco's extension of the Oreo product line to radical breakthroughs such as Toyota's battery-fuelled Prius. While invention forms part of the innovation process, the latter goes far beyond invention because it embraces the critical process of commercialization so that new products, services or processes can be successfully introduced onto the market.

The key research issue in this context is Singapore's ageing workforce and the question how this demographic trend plays out within local small and medium-sized manufacturing firms with their diverse talent pools comprising both mature and younger employees with different approaches towards work etc. While the effects of an ageing workforce on innovativeness are relatively well documented in non-Asian firms (Leibold & Voelpel 2006), there is very little knowledge about the extent to which an age-diverse workforce creates synergistic combinations of task-related resources in local SMEs in the context of innovation management. Our research focus is technology-intensive small and medium-sized firms (SMEs) in Singapore. We will share insights gained during the on-going study to plausibilize the following hypothesized relationships between an age-diverse workforce, the utilization of mature employees as potential sources of experience-based new idea generation and the organizational ability to integrate their insights into the management of innovation:

Hypothesis 1: The role of the SME leader will have a positive effect on the ability to effectively leverage mature employees as sources of innovativeness.

Hypothesis 2: The impact of an ageing workforce on successful innovation in local SMEs will be mediated by how innovation is organized.

Hypothesis 3: Recognizing and managing the levers of culture that affect innovation in contexts of demographic diversity has a positive impact on top- and bottom-line growth in SMEs.

The theoretical and practical implications will be discussed aimed at supporting on-going national efforts to upgrade Singapore's SME sector.

Introduction and Discussion of Hypotheses

Small-sized enterprises with an annual turnover of not more than S\$20 million and medium-sized enterprises with an annual turnover between S\$20 million and S\$100 million are of critical importance for Singapore's manufacturing sector. Collectively, Singapore's SME sector comprises of 92% of the total establishments, employing 51% of the workforce and generating 34% of total value added. While there are numerous success stories of local SMEs expanding into new markets with innovative business models such as CKE Manufacturing which makes up to 3000 different components for the oil & gas industry (Straits Times, July 17, 2012, p. 11) or Qian Hu (Menkhoff 2014), others are challenged by issues such as sluggish demand, insufficient change propensity or difficulties to making innovation work.

One mega trend whose implications for business and society are poorly understood is the demographic trend of an ageing workforce. About a decade ago, writer Paul Wallace published "Agequake: Riding the Demographic Rollercoaster Shaking Business, Finance and our World" (2001), a visionary book that examines the possible ramifications of ageing as a global "implosive" phenomenon. In it, he posited that rising longevity and lower fertility has a dramatic impact on population structures worldwide, and that it will "shake" up business, pension systems and lifestyles. This is not surprising. However, there is still widespread ignorance amongst leaders in business and society about the implications of this transformation. This is a challenge rapidly ageing Singapore cannot ignore. With increasing life expectancy and a decreasing fertility rate, the proportion of residents aged 65 and above is on the rise here, too. In 1990, there were 11.8 residents aged 16-64 years for every resident aged 65 years and over. In 2010, this became 8.2 (without PRs, it is 7.2 per elderly person). As Prime Minister Lee Hsien Loong has stressed repeatedly during National Day Rally Speeches, more needs to be done to combat these demographic trends. Legal state-led responses in Singapore include new age-specific policies with regard to financial security (CPF), employment, health etc. based on statistical evidence and ageing-related master plans aimed at mitigating declines in actual income or providing jobs for the growing pool of elderly persons who would like to work if given a chance.

What is the Role of Leadership in Leveraging Mature Employees as Sources of Innovativeness?

The business sector plays a major role in capitalizing on the agequake (Chaston et al. 2007; Pot 2011). Yet, there seems to be a major 'not being aware-knowing-doing gap'. In a Business Times article published on December 18-19, 2010, the Chairperson of Singapore's Employer Alliance, Claire Chiang, convincingly argued that Singapore stands to lose the

contribution of a major part of the Singapore workforce if organizations fail to “re-engineer” their human capital strategy to “embrace” older workers. That is easier said than done. ***Research in the US shows that contrary to uni-generational teams, multi-generational work teams comprising members representing baby boomers, Gen X, and Gen Y often have more negative knowledge flows in meeting their goals because of communications and project management leadership issues, personality differences, attitudes towards work, or value incongruences*** (Liebowitz et al. 2007). Often, these knowledge barriers lead to substandard work and project delays. The proposed study will shed light on what’s going on in multi-generational work teams in local SMEs when it comes to ideation and innovation.

There are several strategies (SME) employers can pursue to leverage on an intergenerational workforce (Ebie et al. 2011; Fuertes et al. 2013). The formation of an *informal employee resource group*, for example, can provide employees with structured opportunities to discuss their apparent differences and to discover unexpected commonalities to increase collaboration. Other approaches include the *creation of special communities of practice / interest* (Wenger & Snyder 2000) to discuss the challenges faced by employees, for example those over age 50, mentoring, diversity training or informal knowledge transfer methods. The same approaches can be used to kickstart *strategic ideation processes*, provided employees know how to ideate and ‘the boss’ is able to initiate it (Beaver & Hutchings 2005).

As we have demonstrated in earlier studies (Wirtz et al. 2008), knowledge combination enables the cross-fertilization of ideas which often lead to product and/or service innovations. Useful tools in this context are *communities of practice (COP) initiatives* aimed at combining the competencies of various experts. Wenger & Snyder (2000) define communities of practice as groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly. COPs have been implemented in business, organizational design, government, education, professional associations, development projects, and civic life. Members form powerful social networks that enable them to learn with and from each other. COPs flourish in collaborative organizational cultures characterized by care and trust (Hansen 1999; Von Krogh et al. 1998, 2000, 2001; Ribièrè & Tuggle 2005; Chay et al. 2007). In the context of our study, we argue that SMEs must find ways to create strong COPs comprising both mature and younger employees. To what extent SME leaders are able to leverage such tools in their firms as potential sources of innovativeness remains to be seen.

In order to benefit from the collective wisdom of older employees, Claire Chiang proposed a simple yet effective knowledge management tool: *inter-generational sharing sessions*. The knowledge management research conducted by the author in Singapore shows that knowledge sharing aimed at exchanging information, actionable knowledge or lessons learnt with those who can benefit from it is crucial in achieving organizational goals with regard to operational improvements, risk management or new knowledge creation (innovation). While many organizations in Singapore have already implemented some form of work-life integration with particular emphasis on the needs of both Gen Y and older employees, more needs to be done in terms of awareness building and to leverage on the institutional knowledge and valuable competencies of older employees to achieve positive performance outcomes (Bawany 2014).

Table 1: The Multi-Generational Workforce

Generation	Years Born	Work Perspectives
Traditionalists	1922 - 1945	"Company loyalty" - Believed they'd work for the same company their entire career.
Boomers	1946 - 1964	"Live to work" - Believe in putting in face time at the office. Women enter the workforce in large numbers.
Gen Xers	1965 - 1980	"Work to live" - Believe that work should not define their lives. Dual-earner couples become the norm.
Gen Yers (Millennials)	1981 - 1994	"Work my way" - Devoted to their own careers, not to their companies. Desire meaningful work.
Gen Zers (Linksters)	1995 to present	"Living and Working their way" - Their struggles in the work environment are tied to their youth and inexperience. Desire for change, stimulation, learning and promotion that will conflict with traditional organisational hierarchies.

Source: <https://www.linkedin.com/pulse/20140721005923-31761-harnessing-the-potential-of-a-multi-generational-workforce>

Simple, inexpensive low-tech tools such as *story telling* or the *knowledge café method* can help to unleash the actionable knowledge, emotional-cognitive intelligence and innovative wisdom of older staff. This has been demonstrated by the success of respective learning organization initiatives in local security organizations where young officers are eager to learn from their seniors how to deal with everyday job risks or in the local health sector where inter-generational knowledge sharing activities have helped to avoid re-inventing the wheel and to create service innovations.

Leadership plays a key role in recognising the importance of mature employees in the context of inter-generational innovativeness besides the general need for effective mature workforce management (Fuertes et al. 2013; Menkhoff et al. 2008). Leadership must provide guidance for creating synergistic combinations of task-related resources so that innovation becomes a fundamental part of the business mentality. Therefore, we hypothesize the following:

Hypothesis 1: The role of the SME leader will have a positive effect on the ability to effectively leverage mature employees as sources of innovativeness.

To What Extent Does Organizing for Innovation Mediate Successful Innovation in Age-Diverse SMEs?

Innovation research suggests that innovation needs to be properly organized. This entails several measures such as the development of relevant innovation platforms cutting across organisational "silos", creating portfolios of innovation projects or forging external partnerships to complement internal talent. Relevant here are broad issues of innovation strategy, ideation (development of good ideas that can be turned into innovations), the structuring of innovation teams and their composition, partnership management as well as

the scope of business model innovation. The implications of effectively organizing for successful innovation in local SMEs for sustainable value creation vis-à-vis both mature and younger employees needs to be explored before systematic insights can be gained. Empirical studies which could shed light on how best to structure age-diverse Asian SMEs for innovation are hard to come by. In view of the importance of building the right organization with the right people for executing innovative ideas, we argue:

Hypothesis 2: The impact of an ageing workforce on successful innovation in local SMEs will be mediated by how innovation is organized.

An underutilised opportunity to drive innovation is the strategic management of intersectional innovation (Johansen 2002). Today, there are many innovation challenges which cannot be solved by one scientific discipline alone. Many questions relating to health, ageing, energy, climate change and others require thinking across different fields (Chaston et al. 2007). Learning to step into an intersection of fields, disciplines and cultures can generate a large number of extraordinary ideas for innovation. While this sounds good in theory, practicing it can be a challenge for those responsible for making innovation work. Two key reasons are the widespread knowledge-hoarding mentality of Asian SMEs and the difficulty to motivate smart (knowledge) workers to become more innovative.

One simple approach to tackle such issues and to introduce smart people to the mindset and logic of innovation potential at intersections is the *Medici Board Game*, based on the bestselling book “The Medici Effect” published by Harvard Business School Press a couple of years ago. It was developed in co-operation with its author Frans Johansson (2002) and helps to explore confluences that occur when different ideas are combined to create insights which may lead to new strategies, products and services. Such confluences can be brought about coincidentally as well as systematically. Creating an environment for innovation is about creating the conditions for organisations in which intersectional learning and confluences can happen more easily.

The Medici Game (developed by a Swedish learning tool developer) engages participants in discussions that lead them to challenge their beliefs and assumptions around good – or not so good – management practices for fostering innovation friendly conditions and a creative environment. On the basis of small group discussions and with the help of engaging innovation cards, participants explore the intersections between different disciplines and fields of science. Warm-up questions include: What are potential fields for intersectional innovation between precision engineering and the oil & gas industry or between ICT and medicine? How can biology inspire the water industry? How can people with different demographic backgrounds in terms of age, country of origin and/or specialisations be innovative?

Which Levers Can Be Pulled to Create a Robust Innovation Culture in Age-Diverse SMEs?

Intersections are places where ideas from different fields and cultures meet, leading (potentially) to an explosion of ideas and possibilities. What are the forces that are creating it and why is this type of innovation growing in importance? Innovation management experts distinguish between incremental and disruptive, intersectional ones. According to Johansson, combining concepts within a particular field can generate interesting ideas but

that represents a somehow narrow approach because they evolve along a particular direction. Contrary to such 'directional ideas', stepping into the intersection enables the combination of concepts between multiple fields, generating 'intersectional ideas' that leap in new directions. Examples with commercial potential include electronic healthcare services (based on the interdisciplinary collaboration between biomedical and info-comm technologies) such as Singapore's electronic health records initiative, Volvo's vision is to develop a collision safety system for automobiles based on the African grasshopper's ability to not collide when it flies in swarms or the ongoing efforts by urban planners, ICT experts, futurists etc. to come up with smart city models where all city-wide subsystems are interconnected via a communicative network of sensors, data and smart devices enabling stakeholders to access real-time information on traffic conditions or faulty streetlights.

We can think of intersections as physical and mental spaces of innovation. Innovation is increasingly seen as a recursive process instead of the old view of innovation as commercialised invention based on technological or scientific knowledge. The recursive innovation model stresses the versatile feedback mechanisms and interactive relationships involving producers (companies), product users, scientific and technical research, development activities, and supporting infrastructure. It is a model of continuous learning, in which the actors in different fields learn from each other in interactive innovation processes.

Unfortunately, smart people sometimes refuse to learn and to explore innovation potentials as evidenced by numerous research studies conducted by learning organisation experts (Argyris 1991). In many knowledge-intensive organizations learning is often "single-looped" (a term coined by Professor Emeritus at Harvard Business School, Chris Argyris) qua improvements that rest on unchallenged, implicit assumptions. Attempts to identify and question underlying assumptions (Argyris refers to this as "double-loop learning") and to debate alternatives, e.g. to the traditional approach of doing business, are often thwarted by organizational antibodies that can ultimately defeat innovation efforts. Whether this is a matter of concern in local SMEs will be studied.

There are numerous levers which can be used by management to shape, influence and revitalise the firm's organizational culture. A proven, inexpensive tool is story telling, e.g. about 'intra-organisational' legends and heroes such as the deceased master craftsman who used to deliver newly drilled work pieces to customers at night. The success of US firms such as Google or IDEO underlines the importance of a firm's physical environment in enhancing staff creativity and innovativeness. Many local SMEs are visually unattractive which arguably has a negative effect on innovativeness. How can mature and younger employees jointly discover by themselves (rather than being told) innovation opportunities if there is 'no nice place' for creating shared meanings, something the Japanese KM expert Nonaka has coined 'ba'. Other levers include rewards which need to be aligned with the firm's innovation strategy and performance indicators. Thus, we hypothesize the following:

Hypothesis 3: Recognizing and managing the levers of culture that affect innovation in contexts of demographic diversity has a positive impact on top- and bottom-line growth.

Procedures for Collecting Data

As outlined above, this theoretically-informed empirical study examines some key hypothesized relationships between an ageing workforce, the organisational ability of SME leaders to leverage on age diversity (mature employees vs. younger workers) in the context of (more) effective innovation management with a view to enhance the performance of small and medium-sized manufacturing firms in the local context of Singapore. To further refine and later test our model, we are conducting a thorough literature analysis in line with our research objectives as well as exploratory interviews with successful SME innovators in Singapore. This will help us to further improve our model, to further streamline logically valid propositions (see below), and to test the model through empirical survey data collected in Singapore in collaboration with an external body, e.g. the Singapore Employers Federation. As outlined above, the novelty of the study is based on the unique research theme with its emphasis on examining to what extent an age-diverse workforce creates synergistic combinations of task-related resources in local SMEs in the context of 'good' innovation management in Singapore's small business sector. This is a severely under-researched area. The research effort will be structured via three hypotheses whose relevancy has been outlined above. The proposed theoretically-informed empirical study utilizes a multi-method approach so as to further ascertain our arguments and propositions as well as firming up our conceptual framework (model) through empirical survey data collected in Singapore with the help of an external partner. In addition to a SME survey, we are conducting 10 exploratory interviews with the leaders of technology-intensive small and medium-sized manufacturing firms.

Case Studies

An interesting case is **Orange Clove Catering** which was established in 2008. The company under the leadership of Mr Elvis Lee focuses on providing "creative fusion dishes". As stated on a website (http://www.hungrygowhere.com/singapore/orange_clove/), it "delivers restaurant-quality food and reliable service, backed by a well-coordinated preparation-to-delivery process, strict selection of ingredients, and uncompromising quality control standards. We offer buffet packages, wedding packages, breakfast packages, Thai cuisine, Indian cuisine, vegetarian packages, and many more." Amongst its innovations are a *portable conveyor belt*, *digital marketing platforms*, *the use of social media*, *a food truck* (Captain 500) and healthy menus (Business Times, August 25, p. 24). Of particular value for the organisation are millennials which form 80 per cent of its 165 employees. As Mr Lee has argued, the company has a special appeal to this generation due to its culture of "grooming and nurturing" them as leaders. How this relates to the other generations at work in general and innovation management in particular needs to be established.

Another example of an innovative SME is **Wong Fong Engineering** which provides "high-tech and innovative solutions for seamless loading and transport logistics, effective waste management process, quality and friendly mobility aids as well as strengthened and empowered defence systems" with the help of various trusted brands such as Palfinger or Pöttinger (Business Times, July 7, 2015, p. 30). According to its website (<http://www.wongfong.com/about-us/>), the company aspires to be an employer of

choice with special emphasis on creating a shared vision, staff motivation, development, recognition and social responsibility. The firm has its own Research & Innovation Centre and IP strategy. The co. is run by brothers Liew Chern Yean (Technical Officer) and Eric Lew (Director and Executive Director of the company's R& Centre who are the second generation in this family-based business. To what extent the firm's innovativeness is based on generational synergy needs to be ascertained.

Millenials also "run the show" at **OCBC** (Business Times, Thursday, August 27 2015, p. 6). A special role is played by its 14 millennials in the firm's in-house mobile development team with their special skills in technology and programming. According to OCBC's VP of group operations and technology, this generation is "tech savvy", "honest" when it comes to discussing whether ideas make sense, keen to have "their own way of doing things", "and not always following the norms". The bank has its own innovation lab which helped to collect over 7,000 ideas from 1,500 employees, of which 200 have been implemented. This led to savings of about S\$3 million. One key innovation developed by the lab is its OneTouch Biometrics mobile banking app. The interplay between the different generations vis-a-vis fintech development needs to be further explored.

Conclusion

In this applied research project, we intend to examine how business leaders and innovation managers can harness the innovation potential of work teams comprising different generations such as traditionalists, boomers, generation X, generation Y and so-called 'linksters' (the Facebook generation). Empirical research in the West suggests that multi-generation synergy is essential to make innovation work whether in terms of better processes, new products or novel services provided generational divides are bridged, a collaborative (mentorship) culture is instituted and conflicts are nipped in the bud. Very little is known about Asian ways of innovation management in multi-generational teams, a critical issue in view of demographic (ageing) trends here. A key objective of the applied research is to develop a concrete multigenerational innovation framework which can inspire local organizations in Singapore and beyond to proactively exploit the innovation potential of multi-generational teams.

Both theory and practice of innovation management in age-diverse SMEs in Asia is underdeveloped and needs to be further enhanced. The results of this study will be useful for small entrepreneurs as well as scholars and policy-makers in enterprise promotion agencies to appreciate the key antecedents of making innovation work in small and medium-sized firms vis-à-vis the desired performance outcomes. It is envisaged to share the research results in form of joint publications and a panel discussion comprising representatives of local and international good practice firms as well as policy makers. The project results will help to further develop innovation management concepts (frameworks and intervention approaches with regard to cultural change) suitable for SMEs operating in an era of increasing demographic change and diversity by identifying key drivers of successful innovation outcomes with the help of both qualitative and quantitative (multivariate) analysis methods.

In sum, the findings will be useful for CEOs of SMEs, consultants, SME promotion agencies, innovation programmes offered by tertiary institutions etc. who are interested in facilitating the development of a culture of innovation in small business organizations and to successfully cope with the age quake.

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