



***Research on The Impact of Human Resource Factors on Business
Model Innovation in Manufacturing Sector in Singapore:
A Summary of Preliminary Findings***

October 2014

1. Project Background

Frost & Sullivan (F&S) was commissioned by the Singapore Innovation and Productivity Institute (SiPi), supported by SPRING Singapore, to undertake a 3-part research study on the impact of human resource factors on Business Model Innovation in the Singapore manufacturing sector.

The manufacturing sector is a key sector in Singapore's economy, contributing 28% of Singapore's GDP. However, a study conducted in 2010 that compared manufacturing productivity between different countries showed that Singapore's manufacturing productivity was only 60% of the USA. *(Lim, 2010)*

In 2010, the Economic Strategies Committee (ESC), in its report of key recommendations to the Prime Minister, suggested that - for national productivity to improve by a third over the next 10 years, productivity growth should be 2-3% yearly.

However, Singapore's labour productivity growth over the last 5 years (2008-2013) has been quite low, with labour productivity growth at only 1.5% per annum according to the Ministry of Manpower (MOM). It has proved extremely difficult for companies in Singapore to increase productivity to this level and alternatives need to be looked at in parallel to help companies remain competitive.

Business Model Innovation (BMI) is an extremely attractive alternative for companies as it can be successfully implemented without large amount of capital expenditure. The main effect of BMI is increased revenues for companies, and this increase in scale can help companies justify productivity increasing spending such as machinery and automation.

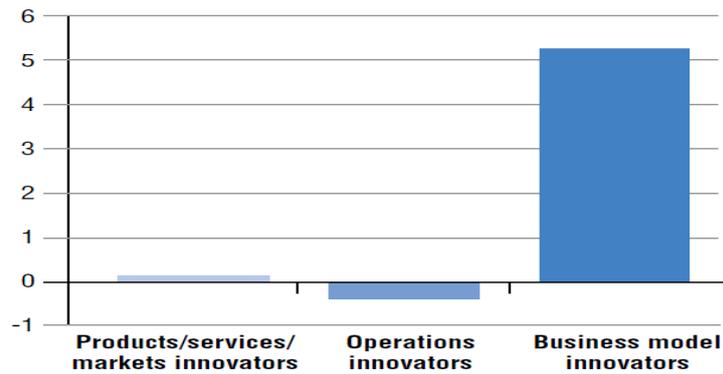
This research project seeks to identify the cultural and human resource best practices that drive innovation in business models of successful companies in Singapore's manufacturing sector.

"Innovation" is defined in the Global Innovation Index 2012 Report as "the implementation of a new or significantly improved product (goods or service), a new process, a new marketing method, or a new organisational method in business practices, workplace organization, or external relations". In the context of this research project, the form of "Productivity" refers to productivity that originates from the implementation of innovative business models and human resource practices.

In IBM's Global CEO study titled "Expanding the Innovation Horizon" published in 2006, CEOs cited BMI as having the strongest correlation with operating margin growth compared to product or operations innovation. BMI also resulted in cost reduction and strategic flexibility for these companies. A CEO is quoted in the study as saying that "Innovating with respect to business models and operations will not only create opportunities for cost savings, but will also lead to additional revenue generation opportunities."

Figure 1: Operating Margin Growth in Excess of Competitive Peers

(Percent compound annual growth rate over 5 years)



Source: *The Global CEO Study 2006: Expanding the Innovation Horizon*

Business Model Innovation is defined in this study as –

Ideas encompassing more than product, service or technology innovation, BMI focuses more on a different way of creating value for a firm and customers by reinventing different aspects of a firm's business. These aspects of a company's business include: product design customization, sales strategies, target customers, distribution channels, research process innovation, etc.

Frost & Sullivan has also classified BMI into 3 main categories with 8 sub-categories. This is provided in

Figure 1 and was derived through an analysis of the Business Model Canvas (Source: *Business Model Alchemist*).

The Business Model Canvas is a strategic management and lean startup template for developing new or documenting existing business models. It is a visual chart with elements describing a firm's value proposition, infrastructure, customers, and finances. It assists firms in aligning their activities by illustrating potential trade-offs. (Osterwalder, Pigneur, Smith, 2010)

Figure 2: 8 Categories of Business Model Innovation



Source: F&S, Developed in Collaboration with Prof. Netessine

Rather than being a singular process, Business Model Innovation is a combination of multiple processes. Ideas generated at the beginning of the BMI process has to be evaluated as well as tested before it can be implemented, sometimes with different people in the organization involved in each part of the process

These four components are what we believe the key components of BMI. These four components can be further separated into 2 main stages:

Figure 3: BMI Idea Generation / Implementation Process



Source: F&S

Human Resource (HR) factors are very important in the BMI process for the very reason that BMI ideas that were successfully implemented involved active employee participation throughout the whole process. Successful business model innovators ensure that employees understand the BMI ideas and are behind the expected change in the company.

As part of this study, F&S considered 5 Human Resource (HR) factors and their implication in the BMI process. These factors will be carefully considered for their impact on Stage 1 and 2 of the BMI

process. The factors are; Leadership, Corporate Culture, Organizational Mind-set, Learning & Development and Talent Management.

2. Consulting Approach

F&S used a 3 step approach for this project which will involve 3 key stages.

Stage 1: Benchmarking

Frost & Sullivan conducted a literature search of publically available information to collect qualitative and quantitative information on BMI.

Various types of BMI and case studies of successful implementations were studied in depth for the purpose of benchmarking. In order to get a holistic view of BMI and associated indicators, F&S studied small and large manufacturing companies that are present both in Singapore and globally.

Stage 2: Manufacturing Industry Survey

F&S conducted secondary research on both SMEs & Large establishments, but with higher proportion of SMEs considering the scope of this research is limited to SMEs. The definition of SMEs follows SPRING's definition:

- *Enterprises with annual sales turnover of not more than S\$100 million OR*
- *Enterprises with employment size of not more than 200 workers*

MNCs and Large establishments are included to gather a complete perspective and study any best practices that could be applied to the SME scenario.

F&S completed interviews with 250 manufacturing companies in Singapore for this study.

Stage 3: Focus Group Discussion and Analysis

The Precision Engineering and Electronics Manufacturing sectors were considered for an in-depth analysis and focus group discussion based on the industry's contribution to manufacturing output.

A select group of companies were invited to discuss key challenges and trends in their sector, and how it affects adoption of best practices. Frost & Sullivan also shared insights from the surveys to facilitate the discussions.

The outcome of this study will be provided to SiPi in the form of 3 reports as below –

Report 1

- *Benchmarking report on business model innovation*
- *Identification of correlation among HR practices, business model innovation and productivity*

Report 2 & 3

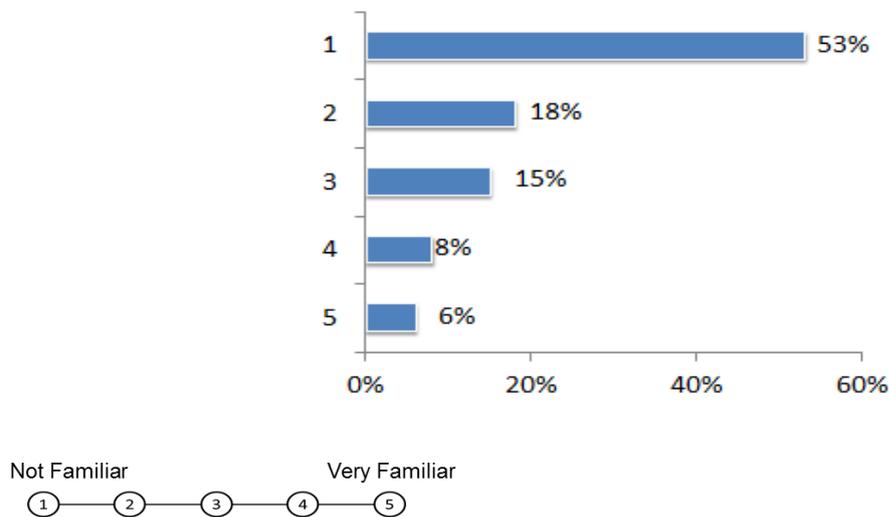
- *Impact analysis of HR practices in Precision Engineering & Electronics Manufacturing Sector*
- *Industry specific issues and challenges*

3. Preliminary Findings

As of October 5th 2014, F&S has just been able to complete the intended 250 interviews with manufacturing companies for this project. Survey data is still being uploaded and vetted by senior members of our team. Therefore, most of the data that will be presented in this section are preliminary and is likely to change once we finalize the report. Target for completion and finalizing of data is expected to be by the end of October 2014. Survey data used to provide the preliminary findings in this section is provided for a sample size of 218.

Preliminary data from this survey shows that although 71% of the companies surveyed were not familiar with the term BMI, most of them were familiar with the concept. This is most likely because unlike productivity, BMI does not have an industry agreed upon definition or use.

Figure 4: Familiarity with BMI



Source: F&S

Companies were also asked on the 3 major factors that would lead them think about implementing BMI, with most companies citing increasing market share and reducing costs as major factors.

92% of the manufacturing companies surveyed felt that they were in a very competitive business environment with rising costs cited as a major factor. They felt that, along with productivity, they had to innovate to remain competitive.

Some of the companies surveyed innovated the way they did business and this resulted in revenue growth that was greater than the industry average over the last 5 years. These companies are what we call Business Model Innovators.

At this preliminary stage, F&S has identified 15 manufacturing companies (out of the 250 companies surveyed) in Singapore who has demonstrated BMI. *(This is subject to change as we finalize the survey data).*

Although 6% seems to be a small number, this compares well with European Union. According to a study published in 2014, 5.5% of the SMEs surveyed in 2010 showed BMI. *(European Commission, 2014)*

Singaporean companies who were identified as BMI companies distinguished themselves from their peers through the following:

1. Greater than industry average growth rates
2. BMI ideas were obtained from all levels of employees
3. Companies identified themselves as risk takers
4. Empowered employees to make crucial business decisions
5. Had similar pull factors
6. Companies were in mainly competitive industries
7. Had intermediate knowledge of BMI

4. Initial Conclusions

Although BMI is a new and emerging area, more than 60% of companies felt it was relevant to their business. 46% of the companies surveyed felt that there was an immediate need for their companies to look at BMI with 67% of the companies expressing an interest in government support for BMI initiatives.

“Productivity improvements can only take you so far before another company decides to invest in even better equipment and catch up with you; BMI is the silver bullet that should be seriously considered to keep Singaporean manufacturing companies ahead of the pack” – quote from focus group participant, 2014

BMI is indeed a very important area for companies to consider and many Singaporean companies want to look at ways that their company can be involved. F&S believes that increased government support for BMI can transform this nascent interest into adoption. Our initial thoughts on the government’s role in this are as follows –

Stage 1: Create Awareness

Our survey showed that 71% of companies were not aware of the term BMI; this can be rectified by conducting workshops and seminars. Seminars should focus on the relevance of BMI to the Singapore manufacturing sector, especially to potential increase in revenues and operating margin growth.

Generating awareness for BMI will be a long process and concerted effort by both the government as well as agencies such as SiPi can help companies get a better grasp of BMI.

Stage 2: Educate through Case Studies

BMI is a concept that is best understood through case studies. However, most case studies that are currently easily accessible focus on BMI through the internet; which, although helpful, might not be easily understood by SMEs. A repository of case studies relevant to manufacturing, especially on an SME scale should be maintained as reference.

According to Confucius, *"Only the wisest and stupidest of men never change"*. Change is inherently difficult, but through a greater understanding of the necessity for change through case studies, companies will be able to adopt a less conservative mind-set.

Stage 3: Support in Implementation

Implementation of BMI ideas is the most critical phase of the BMI process. Many companies fail not because their ideas were bad; these companies failed because they implemented a good idea badly.

BMI involves companies making painful changes internally and for most companies this would be difficult to execute on their own. Government help can come in the form of providing consultants that can work closely with SMEs to identify areas where BMI can work for the firm and to help implement BMI.