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# **Rule #1: Value co-creation starts with a firm-level innovation culture**

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**At the firm level, what facilitates co-creation of value? This paper reflects on the theoretical literature on value co-creation and makes the argument that a strong firm-level innovation culture is an essential prerequisite to co-creating value between firms and customers. This study reports the results of a benchmarking exercise of firm-level innovation practices in a representative sample of 215 manufacturing SMEs across 6 industrial sub-sectors in Singapore.**

**Singapore is undergoing sweeping economic reforms aimed at reenergizing the manufacturing sector, improving productivity, fostering collaborations and innovation in creating value. The government's efforts in Singapore to incentivize firms to collaborate with external stakeholders and co-create value is largely encumbered by firm-level characteristics (poor communication, limited empowerment, lack of collaboration, top-down approaches, limited appetite for risk and failure) and other attributes that do not facilitate innovation, collaboration, and co-creation of value. Our findings are a lesson in caution, and the limited efficacy of the role of incentives to improve collaboration and the creation of value, in the absence of a culture that facilitates innovation.**

## **1. Introduction**

The need for firms to design products and solutions that offer an immediate value proposition to customers has precipitated efforts being made by firms to foster closer ties and relationships with its customers. Decades ago, this would take the form of focus groups to understand how the markets would react to a new product and how best to meet the needs of a firm's particular market segment. There has however been a distinct shift in the underlying orthodoxy that firms can autonomously design products, develop production processes, and create value for customers to the proposition that informed, networked, empowered, and active customers are increasingly co-creating value with the firm (Prahalad and Ramaswamy, 2004). The traditional orthodoxy that firms are creators of value, and thus are in control of the design and development is largely untenable as most firms left to their own are unable to keep abreast of rapidly evolving tastes, preferences and buying decisions of customers whether

it's a new manufactured product or a service innovation.

The evolution of Apple's iPad and the numerous accompanying software applications are a case-in-point. It is difficult to believe that the iPad was nowhere on the 'must-have' list of technology products for customers until five years ago; and, today, such tablet devices have become second-nature to many. The personalised experiences customers are able to enjoy today through the use of smartphone applications from music to health to games and to communication and networking is incredible. Value co-creation, thus has become a major challenge for firms and its managers as it moves from product and firm-centricity to customer-centricity (Prahalad and Ramaswamy 2004; Ramirez 1999).

Technology i.e. the internet, in particular, is a great enabler and equalizer, today. It can boost new product sales or equally kill new products in little time depending on how customers value the product. Firms like Uber and Airbnb are testament to this trend. These

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billion dollar firms own almost nothing of what they sell but provide the most important part of the business service – the technology platform for buyers and sellers to communicate. A negative experience for customers using this platform e.g. Uber in India, could immediately affect the value other patrons would associate with such firms and the services they provide.

For these reasons, firms are increasingly interested in connecting with its customers throughout the product creation lifecycle and postproduction lifecycle to ensure products or services continue to generate value. Value co-creation is thus seen to be a growing trend. Value co-creation inherently creates value for both, the producers and customers involved. Such value created, mainly through ongoing interactions (Gronroos and Voima 2013), must be greater than what may have been able to achieve with only one party being involved. Thus, in many respects the sum must be greater than its parts (Neghina, CJ Caniels, Bloemer and van Birgelen 2014). It has many proxies as seen in the literature e.g. coproduction (Vargo and Lusch 2008; Poocharoen and Ting, 2013), codesign (Ple and Caceres 2010, Bason, Briggs and Lenihan 2012).

The literature that discusses value co-creation has predominantly focused on the relationship or interactions between the internal and external i.e. the firm and its customer. In doing so, value co-creation has come to comprise of many complex interacting variables - *dialogue, access, transparency, and risk-sharing* – see Prahalad and Ramaswamy (2004) - and has become a multidimensional concept between what a firm must demonstrate such as *connection, trust and commitment* (Randall, Gravier, Prybutok 2011) to what customers perceive as co-creation such as customer citizenship, customer co-creation behaviors (Yi and Gong 2013).

While firms endeavor to build stronger ties with its customers, many scholars have argued that this over time inhibits the firm's ability to innovate. Strong ties between the firms and its customers builds brand loyalty, has downward pressures on costs, increases revenue, and reduces the transaction costs for customers as they are familiar with the quality and performance of the product (Slater and Narver, 1995; Cannon and Homburg, 2001; Palmatier et al., 2006). However, this symbiotic relationship over time creates inertia for the firm from proactively engaging in innovation activities, retooling their business model, and adapting new technology solutions (Christensen and Bower 1996; Christensen 1997; Hamel and Prahalad 1994). The essential idea is that if customers are very loyal or have very strong ties with the firm, the firm has limited incentives to change the fundamental business model. Therefore innovation is often incremental as businesses risk losing customers if they undertake radical departures to existing practices.

Fredberg and Piller (2011) however argue that under certain specific conditions even strong ties to customers can facilitate 'rather than obstruct radical innovation' (p.470). They develop a framework along two dimensions: the degree of customer involvement and

the strength of ties between the firm and the customer. The extent to which businesses actively involve customers in their product design and development is mapped along a vertical continuum. To this they map on a horizontal continuum that ranges from 'weak ties' to 'strong ties' between customers and firms. A firm that has strong ties with its customers, and actively involves them in designing and developing products are firms, they argue, that can still be innovative and co-create value with customers. However, to utilise these 'strong ties' firms have to have specific attributes which will allow them to harness these co-creating abilities.

If we accept the proposition that co-creating value is the dominant paradigm of how businesses and customers interact, respond to business challenges, transact and create value, we have to study firm-level behaviour and practices to understand how firms are creating an enabling and conducive environment that facilitates co-creation. But where does such value co-creation take birth? What are the pre-requisites of value co-creation, particularly at the firm level?

The ensuing discussion suggests that for firms to deliver value to its customer, the firm itself must exhibit certain characteristics of innovation. Implicit in their arguments presented in Fredberg and Piller (2011) is the idea that firms must develop '*co-creating capabilities*' as an essential prerequisite to value co-creation (p. 479). This requires firms to be adept at assimilating new knowledge, and utilize it effectively in responding to challenges in their operating environment (Henderson and Cockburn, 1994). Ketata, Sofka and Grimpe (2015) have also argued this theme particularly looking at internal *absorptive capacities* (the ability to identify and utilize gainfully knowledge from market impulses – see Cohen and Levinthal, 1990) and the need for employment training in Germany's firms. These firm-specific absorptive attributes or capabilities, range from internal communication, risk taking, empowering managers to seek out new innovations, incentivizing employees, collaborating with research and development activities in partnership with research institutions and other firms and ensuring constant assessment of new technologies that make firms more productive. In addition to these factors, engaging with customers to work on process and product improvements is also critical to the value co-creation process.

These elements also resonate in a recent study by Neghina et al (2014, p.4-5) that conceptualizes value co-creation to comprise of three elements- (i) plan that specifies a co-creation outcome (ii) the role of each party in the co-creating activity (iii) acknowledged awareness that the co-creation outcome cannot be achieved without the other; and six dimensions (Karpen, Bove and Lukas 2012) that relate to the actions of achieving a co-creation outcome- (i) individual actions (resource and process related) (ii) relating actions (social and emotional) (iii) empowering (influence and shape) (iv) ethical actions (transparency, integrity and shared risk) (v) developmental action

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(improving the resource usage to benefit the outcome) and (vi) concerted joint action (coordinated, timely and integrated service processes).

These efforts, while valuable, have focused on the meso view of value co-creation and added to conceptual understanding of how value co-creation can be created - one that exists between the firm and customer. As Neghina et al (2014) point out most studies (see Layton 2008, Lusch and Webster 2011, Vargo and Lusch 2011) focus at this level of value creation with limited or no consideration being given to internal *firm characteristics* that must exist before value co-creation can be delivered between the firm and the customer.

This paper addresses this limitation by explicitly studying firm-level characteristics (also referred to as attributes, capacities, capabilities in the above literature) focusing specifically on innovation-enabling practices in the firm. This is important as we have identified above that value co-creation creates new value for the firm and the customer which can only be achieved through ongoing interactions; innovative value.

Firm-level characteristics are often overlooked in order to harness the co-creation elements or determinants identified (Neghina et al. 2014). The central research question that undergirds this paper is to what extent is there a firm-level innovation culture in small to medium enterprises (SMEs) in the manufacturing sector in Singapore for value co-creation to take place?

Singapore's multi-billion dollar productivity drive – currently underway – is aimed at improving firm-level productivity, fostering innovation, and collaboration with customers in hopes that it will revive the ailing manufacturing sector. The central argument in this paper is that building a firm-level innovation culture is an essential prerequisite to co-creating value, and Singapore's current reforms are likely to have limited impact unless businesses foster an environment, a culture, that is conducive to facilitating innovation and creating value. Our findings are a lesson in caution, and underscore the importance of firm-specific attributes in facilitating innovation and the co-creation of value.

The rest of the paper is organized as follows. The next section briefly discusses the context of Singapore's current economic reforms and the research strategy pursued in this project. Section 3 discusses the key findings in the context of the literature on value co-creation and innovation culture. The final section identifies limitations, directions for future research, as well as concluding observations.

## 2. Research Strategy & Methodology

Singapore in 2012 embarked on a series of economic reforms to restructure its economy by reducing its dependence on foreign manpower, increasing domestic labour force participation, and reenergizing the manufacturing sector (Low and Vadaketh, 2014; Asher and Chan, 2015). Singapore's manufacturing sector over the past few decades has experienced low

productivity growth, and current reform initiatives are aimed at incentivizing manufacturing firms through generous grants and tax credits to invest in capital and technology, helping firms compete with regional countries and thereby improve productivity and innovation, and closer collaboration with customers. As SMEs account for about two-thirds of all employment, and 99 percent of all registered businesses in Singapore (SPRING, 2014), their productivity and innovation practices are of particular interest to the government's current economic priorities.

Singapore's government and industry, equally, have been in the search for productive efficiencies at the shop floor front hoping to harness increased firm-level productivity and innovation, if Singapore manufacturing firms have to face emerging challenges and succeed. SMEs are incentivized through generous government grants and schemes to allow for advancement from incremental innovation, the integration of manufacturing firms in global value chains, business model innovations, collaborative activities with external stakeholders and the timely uptake of new technologies. The policy objective is that this co-creation will deliver value to manufacturing sector in the form of innovative products and services, and help revive its share to national income.

The authors were commissioned by the Singapore Innovation and Productivity Institute to conduct a yearlong study (2014) into productivity and innovation among SMEs in the Singapore manufacturing sector. The research objective was to discover the key drivers of total factor productivity in this sector and to examine the performance of SMEs across these key drivers.

The study collected primary data from Singaporean SMEs in identified subsectors on their productivity and innovation practices. The research adopted a three-pronged approach in designing a main survey instrument. First, we critically reviewed the academic literature on the determinants of productivity (including firm-level determinants) and the determinants of productivity in the Singapore context. Second, we interviewed 20 SME leaders across the Singaporean manufacturing subsectors identified to appreciate the policy context and understand the challenges they face. This was followed by a Delphi study where we sought views of global and local experts and thought leaders (including academics, government officials, and policymakers) on the drivers of productivity and innovation in SMEs.

This triangulated approach brought to the fore 6 thematic determinants of productivity in SMES: *technology & capital utilisation; pay & performance management; training, development & firmal learning; innovation culture; government policy, markets and regulation; and leadership and management quality*. Reflecting on the aforementioned approach, a survey instrument containing 41 multiple-choice questions across these six themes was subsequently designed. A stratified random sample based on the share of economic output to the manufacturing sector was drawn from the Accounting and Corporate Regulatory

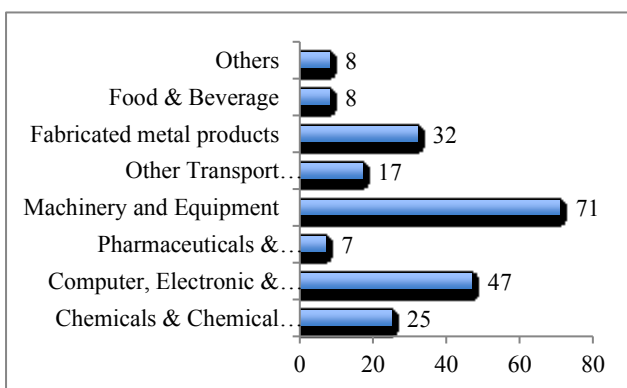
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Authority of Singapore which maintains information on businesses, by Singapore Standard Industrial Classification (SSIC) classification codes. These are listed in table 1 below. These subsectors account for more than 80 percent of manufacturing output in Singapore.

The main survey data was collected through a face-to-face interview with the person ‘most familiar with productivity and innovation issues’ in the firm – usually the CEO or other senior manager. Data was captured on a tablet computer and uploaded to a cloud-based survey administrator in real time. To improve the response rate, we complemented this approach with a ‘snow-balling’ approach inviting SME respondents that completed the survey to introduce us to other SMEs within their network. The number of firms surveyed across subsectors is illustrated in Figure 1.

**Table 1: Industrial Subsector and SSIC Classification Codes**

Industrial Subsector	SSIC Classification – Two Digit Level
Chemicals & Chemical Products	C20
Pharmaceuticals & Biological Products	C21
Computer, Electronic & Optical Products	C26
Fabricated metal products	C25
Food & Beverage	C10; C11
Machinery and Equipment	C28
Other Transport Manufacturing/Engineering	C30



**Figure 1: Distribution of 215 firms surveyed across industrial subsectors**

**3. Results & Discussion**

In this paper, we consider the findings particularly relating to two of these drivers – technology and capital utilization, and innovation culture. In this draft version of the conference paper, we report tabulated results to

the relevant questions in the survey, followed by a discussion that builds the argument that building an innovation culture is a strong prerequisite to co-creating value.

A large proportion of firms’ leaders (67.4%) indicated that they regularly undertake group considerations and involve employees in problem oriented discussions related to quality, production processes and service delivery. Outside of this problem-based approach, less than two-thirds of firms leaders (58%) indicated that they always encourage employees to develop new ways of working or develop innovative products and services.

*1. This suggests that while firms are supportive of employee level involvement on a problem-basis there is limited empowerment to take initiative and seek innovative solutions at the process or product/service level.*

On average, about 50% of the firms’ leaders agreed that in-person communication through open door schemes (50%), meeting with line managers (55%) or senior managers (44%) were practiced (let’s call this the *primary* mode of communication).

Firms seldom used other modes of secondary communication with employees. For instance, 91% firms seldom used attitude surveys, 80% seldom used suggestion schemes, 72% hardly used newsletters or emails, 79% seldom used the company intranet and 70% seldom used employee handbooks.

*2. Firm-level communication with employees is a concern given the low primary mode of communication avenues that exist between employees and management and the poor use of secondary communication avenues. This is in contradiction to (1) wherein firm leaders say employees are encouraged to innovate; yet, the modes of such communication are unclear.*

Firms displayed very poor research and development efforts. Only 20% firms’ leaders agreed to regularly investing in research and a similar number (27%) invested in development activities. This situation is exacerbated with an even lower number of firms (22%) collaborating with other firms and only 11% collaborating with universities to develop products or innovate processes. Reasonable efforts are being made by firms to stay ahead of competition with 33% firms benchmarking practices with competitors, 31% firms considering avenues for outsourcing of production processes and 34% regularly considering business model changes.

The results also indicate that manufacturing firms hardly engage in the use of consultants and not much emphasis is placed on crowdsourcing ideas and new thinking. Only 7% firms invest in these activities on a regular basis. Firms are also less customer-oriented; in that around 41% of firms indicate that they never or only sometimes interact with their customers to develop new products and services.

3. *From 1 and 2, it is evident that firms tend to be problem-oriented with poor internal communication mechanisms and limited investment in effort that is research and development oriented and collaborative and to a large extent behaviour that is inconsistent with open innovation. It can be surmised that the poor internal level communication is also replicated in firm-level behaviour with external stakeholders. The firm-level focus, thus, tends to be problem oriented and thus short-term solution-oriented as opposed to long-term innovation oriented.*

About one-quarter firms encourage and empower employees with full discretion where process and products/services development is concerned. An overwhelming 70% firms leaders say employees have little or no discretion when it comes to developing new firm policies to facilitate innovation. Only 29% of firms leaders indicate that they offer employees full discretion to develop new markets for existing products and services.

4. *This shows that firms are indeed short-term in their approach where employees are encouraged to seek new markets for existing products and services, but have little or no say when it comes to process or product/service improvement – innovation, in simple.*

As far as innovative practices are concerned, only 34% firms leaders accepted that they were comfortable experimenting with new products and services, 26% were tolerant of failure and 19% were comfortable with risk-taking.

5. *This supports the argument made in 4, further suggesting that a very small proportion of manufacturing SMEs are serious and committed to innovation at the process and product/service level with an overwhelming majority of firms still being cautious about innovation. This cautious nature can also be a result of a risk-averse and poor-communication firmal culture suggested in 1, 2 and 3.*

Given the technological advancements that are continuing to make the manufacturing sector more productive in countries like Germany, we explore under the Technology and Capital Utilisation driver how advanced the Singapore manufacturing sector has become and if a lack of an innovation culture at the firm level is having a negative impact.

Only 12.6% of the firms leaders consider their technology use in the firms operations to be state-of-the-art with an overwhelming 79.5% of firms being industry standard. Aside from the use of smartphones and tablet computers, which only 49.3% of firms greatly utilise, the level of advanced technology uptake is poor across the sector. A small proportion of firms (27.9%) utilise computer numerically controlled (CNC) machines, 24.2% firms make use of enterprise resource systems and cloud-based computing systems are greatly

utilised by only 23.7% of the firms. A very small proportion of firms (18.3%) utilise technologies for automation, customer relationship management software is used by 13% of firms and robotic manufacturing technologies are used by 8.8% of firms.

6. *With challenges to traditional manufacturing business models and the technological advancements that have become available, such poor uptake of technological tools and even poorer application of automation technologies is resulting in the poor productivity of the sector.*

It is well known that technology uptake requires firms to invest time and effort. The research findings indicate that only 17% firms leaders assess new technology solutions and only 34% undertake this assessment on an annual basis. Firm-level benchmarking with those firms that possess state-of-the-art technology is not regularly practiced either. 37% of firms seldom make an effort here and only 23% firms undertake this as an annual effort. The use of consultants to advise on technology solutions does not feature as an industry practice either, with 58% seldom using them and only 23% firms utilising consultants on an annual basis.

7. *Such firm-level practices, with regard to new technology assessment and uptake, has resulted in Singapore's manufacturing sector being less than cutting-edge when compared to other advanced economies.*

An overwhelming majority of firms leaders (74%) believe that senior managerial capabilities is an important factor that can drive the firm's interest in new technology solutions. 77% of firms leaders also believe the knowledge to seek out new technologies while 62% believe that the availability of quality new technologies are also important factors where technology uptake is concerned.

8. *Despite these beliefs, the empowerment and encouragement of employees to take initiative is limited; firm level collaboration with R&D activities is poor and despite the availability of state-of-the-art technology in Singapore, firms do not spend time to assess and invest in such advancements.*

Further to such aggregate level industry findings, the paper also offers some discussion to look at firm-level innovation related practices in the seven sub-sectors of manufacturing. For instance, our findings indicate that Pharmaceuticals and Biological Products sector, Food & Beverage and Computer, Electronics and Optical Products were the most innovative of these sub-sectors.

#### **4. Concluding remarks**

This paper sets out to argue a key element – for firms to be able to co-create value with customers;

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firms must demonstrate certain innovative-enabling practices. This paper particularly identifies factors such as – empowerment, firm-level communication, short-term problem orientation nature, employee discretion, firms' commitment to innovation, technological uptake and internal research efforts.

From the research undertaken with the SMEs in Singapore's manufacturing sector, reasons are evident as to why the sector has been ailing. Despite some firms displaying higher levels of innovative-enabling practices the experience is not widespread. The government's efforts in Singapore to incentivize firms to collaborate with external stakeholders and co-create

value are largely encumbered by firm-level characteristics and attributes that do not facilitate innovation, collaboration, and co-creation of value.

These insights help us argue the central theme of the paper, which suggests that without internal firm level innovation efforts co-creating value for the end customer can remain futile. Although these findings are specific to Singapore's manufacturing sector, particularly SMEs, they may translate to other regional economies in the region. Unless further studies are conducted in this regard, caution must be applied to extrapolate these findings into generalizations.

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