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INNOVATIONS OF VIETNAMESE PROCESSING AND MANUFACTURING ENTERPRISES IN THE CURRENT CONTEXT

Trang, Nguyen Thi¹ & Lan, Dang Thi²

¹Economics Department, Hanoi University of Business and Technology (HUBT).

²The Faculty of Accounting and Auditing, Banking Academy of Vietnam.

*Corresponding Author: Trang, Nguyen Thi

Corresponding Author Email: trangnt205@gmail.com

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ABSTRACT

New technologies create new ways of sourcing to meet the needs of previously traditional markets. The new demands for production and consumption and changing consumer expectations require businesses to change their production, business, design, marketing, and product distribution methods. With globalization taking place more and more strongly and the emergence of the 4.0 industrial revolution, innovation creates a competitive advantage for the country and businesses. In Vietnam, the processing and manufacturing industry has played an essential role in the economy's driving force. This article aims to assess the role and status of innovation for the survival and development of processing enterprises in the Covid-19 epidemic

Keywords: Innovation, Technology, Competition, Processing, Manufacturing Enterprises.

INTRODUCTION

In the current conditions of globalization, the competition is increasingly fierce, and enterprises want to stand and develop in the market. There is no other way to implement innovations in production and business by themselves. Innovation is almost a requirement for enterprises to compete and develop sustainably in the market (Ancona and Caldwell, 1987).

Many authors mention the content of innovation through different periods and gradually perfected it to suit the development of the economy. It can be argued that innovation goes hand in hand with humanity's evolutionary history (Ram, Cui, & Wu, 2010). From the 1930s, economist Joseph Schumpeter (1883 – 1950) was considered a pioneer. His research works are inherited and profoundly influence later innovation studies (Schumpeter, 1934).

Inheriting and developing previous studies, in 2005, the Organization for Economic Co-operation and Development (OECD) defined innovation at the enterprise level. This definition is now in reasonably everyday use. "*Innovative innovation is implementing a product (good/service) or a new or significantly improved process, a new marketing approach or a new organizational approach in operational practices, work organization, or the outside*".

This activity, while costly and risky, is necessary to increase competitiveness. Innovation is not only research and development (R&D) but also post R&D activities related to production, distribution, marketing, and other complementary activities.

According to the OECD classification, innovation falls into four categories:

- (1) *Product innovation*
- (2) *Process innovation*
- (3) *Organizational innovation*
- (4) *Marketing innovation*

Economic Theories of the Impact of Innovation on Development

The benefits of innovation from a micro and macro perspective have been demonstrated by developing organizations and economies alike. Innovation is at the heart of modern growth and development theories (Szirmai, 2011). Along with traditional factors such as costs, technology products, and processes, innovation has become the key to the competitiveness and success of the business. Competition in the global economy is increasingly knowledge-based. Even in supposedly traditional economic sectors such as textiles, leather, or food processing, innovation and technological progress have become key to growth (Sinh, 2010). The same applies to service sectors such as distribution and retail, financial services, and information technology services. Innovation is also intimately linked to changes in the economy's structure, technological upgrades in production, and the move to higher value-added activities in the global value chain.

Technological change is reflected in new generations of machinery and equipment and new generations of better-educated workers. There are also distinct advances in product and process technology due to formal and informal investment in R&D. Appropriate and differentiated technological increases total factor productivity, which has been used to explain more than half of the differences in economic growth rates across countries (Luong, 2020). However, technological changes improve economic output and improve the quality and nature of production. New technologies create a wide range of new goods and services.

Both the endogenous growth theory and evolutionary growth theory emphasize that traditional factors of production such as labor or profitable capital diminish. At the same time, investment in beneficial knowledge increases due to the positive impact and diffusion of knowledge among economic agents (Tran, 2019). The flow of knowledge and technology from pioneers to followers was rapid, so innovations quickly spread across the economy. The endogenous growth theory helps us understand the per capita income distribution between rich and developing countries in the world economy.

Innovation and technological advancement can also help developing countries catch up more quickly. These developing countries can acquire and creatively apply international technical

knowledge to achieve rapid growth. Gerschenkronian and evolutionary growth theories suggest that backward economies can benefit from the advantages of technological backwardness. They could benefit from the global spread of technology. They have access to new technologies without costs and risks when investing in new knowledge.

Whether or not developing countries can benefit from the advantages of technological backwardness depends to a large extent on their social capabilities and their acquisition capacity. Therefore, necessary for developing countries, innovation refers to developing new products or processes and the ability to acquire technology creatively. If the absorptive capacity is sufficiently developed, rapid economic growth in a technologically backward country is not a miracle but a standard (Szirmai, 2011).

The traditional theory of macroeconomic growth is a black box. It allows us to analyze the characteristics and choices of different enterprises and entrepreneurs responsible for capital accumulation, hiring workers, structural change, and developing or applying new technologies. Entrepreneurs are actors who respond to opportunities, threats, uncertainties, constraints, and incentives arising from the economic environment they operate. Therefore, it puts the entrepreneurial spirit at the heart of growth, development, and catching up with the economy. By innovating and commercializing inventions and adopting innovations developed by others, entrepreneurs in developing countries influence the pace of technological change and structural transformation of the economy. Entrepreneurs, commercializing technology, often through the creation or expansion of companies, adopt and spread technology to increase the productivity of the overall factor. Creativity, ability, and the dynamic aspect of absorptive capacity are distinctive features of a successful development experience. How entrepreneurs perform this function will vary across different stages of a country's development.

It is essential to take into account the context of developing countries. In catching up with governments, innovators initially focused on providing incremental improvements to existing foreign designs rather than creating new products and technologies worldwide with too much at stake. In later stages of development, they will gradually move into more recent innovations in the global perspective. Therefore, the challenges faced by entrepreneurs will also change in the process of economic development.

Status of Innovation of Enterprises in the Processing and Manufacturing Industries

The Overview of Enterprises in the Processing and Manufacturing Industry

The processing and manufacturing industry (PMI) plays an essential role as a foundation in industrialization. The advent of disruptive technologies comes from the PMI industries, especially the electronics and information technology industries in the 4.0 industrial revolution.

In Vietnam, the processing and manufacturing industry has played an essential role in the economy's driving force. It is the evidence when considering the proportion of processing and manufacturing industries in the economic structure and job creation.

From 2010 to 2019, the sectors with the most significant contribution to the economy in the order of agriculture, forestry, and fisheries (17.0%); health care (14.2%); wholesale and retail (9.8%); mining (9.2%). The remaining economic sectors contribute less than 6% (General Statistics Office, 2020).

The PMI industry is a significant job-creating sector in the economy. The PMI industry created jobs for 8,373.4 thousand workers/year from 2010 to 2019, and the labor contribution increased from 13.5% (in 2010) to 20.7% (in 2019). In the PMI industry, apparel, footwear,

food processing, and electronics have played an essential role in creating jobs and absorbing labor from the agricultural sector (General Statistics Office, 2020).

The improvement of the business environment in Vietnam recently has increased quickly among many enterprises in the economy. The number of newly-established enterprises rose from 77,548 (in 2010) to 138,139 enterprises (in 2019). However, the number of newly-established enterprises with PMI is low compared to the economy. In 2019, only 17,214 PMI enterprises were newly established. The total number of newly-established enterprises in the economy in 2016-2019 increased by 7.9% per year, while the figure for PMI reached only 5.2% (General Statistics Office, 2020).

It is noteworthy that newly established PMI enterprises are more from traditional industries than new ones, especially innovation. Newly established enterprises (food processing, textiles, leather.) are primarily labor-intensive industries. Meanwhile, the number of newly-established enterprises is relatively modest in sectors requiring high innovation, such as the production of electronic products, computers; the production of drugs, pharmaceuticals; means of transport (automobile industry and its auxiliary industry); the production of machinery and equipment. It is a challenge to consider in the context of the fourth technological revolution, especially in electronics and computers.

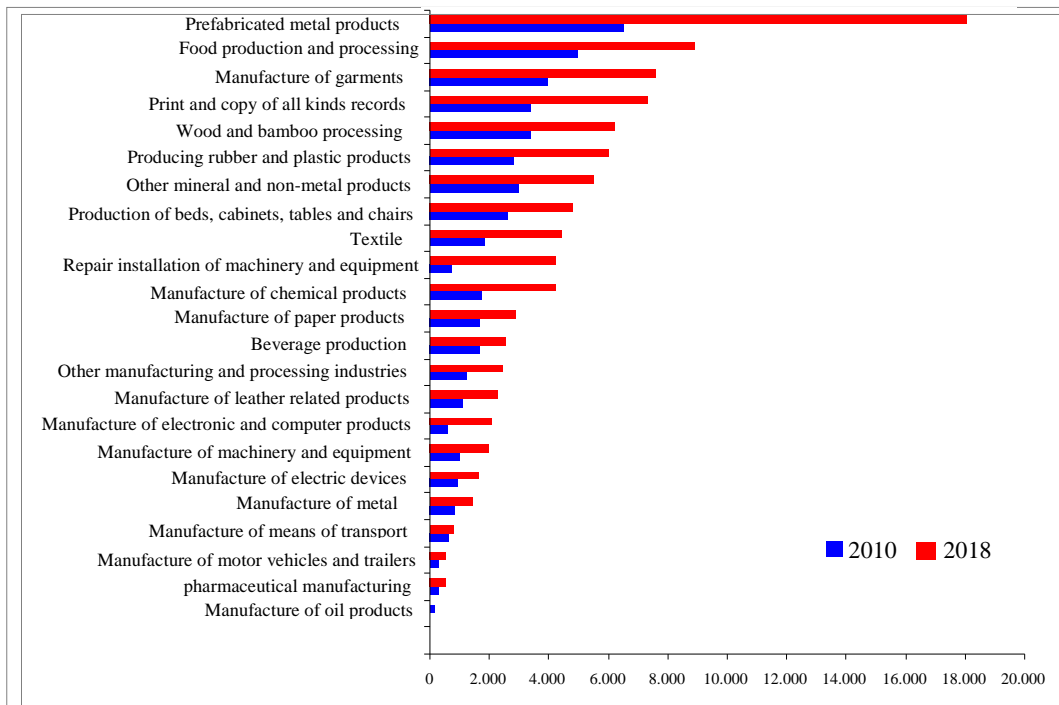


Figure 1: Newly established enterprises in PMI industries (General Statistic Office of Vietnam, 2020)

Along with the increased number of established enterprises, working enterprises in the economy increased rapidly from 279,360 in 2010 to 758,610 in 2019. It is about 2.7 times more than ten years. However, during the same period, the number of PMI enterprises operating in the economy was still relatively modest. In 2010, Vietnam had 45,472 PMI enterprises accounting for 16.3% of the total number of enterprises operating in the economy. By 2019, the corresponding figure was 115,548 enterprises and 15.2%. These data show that PMI enterprises operating in the economy tend to increase over time, but the number is still tiny and accounts for a low proportion. In the period 2010-2019, the growth rate of the number of PMI enterprises was lower than that of the whole economy, and there were not many large fluctuations and slow growth.

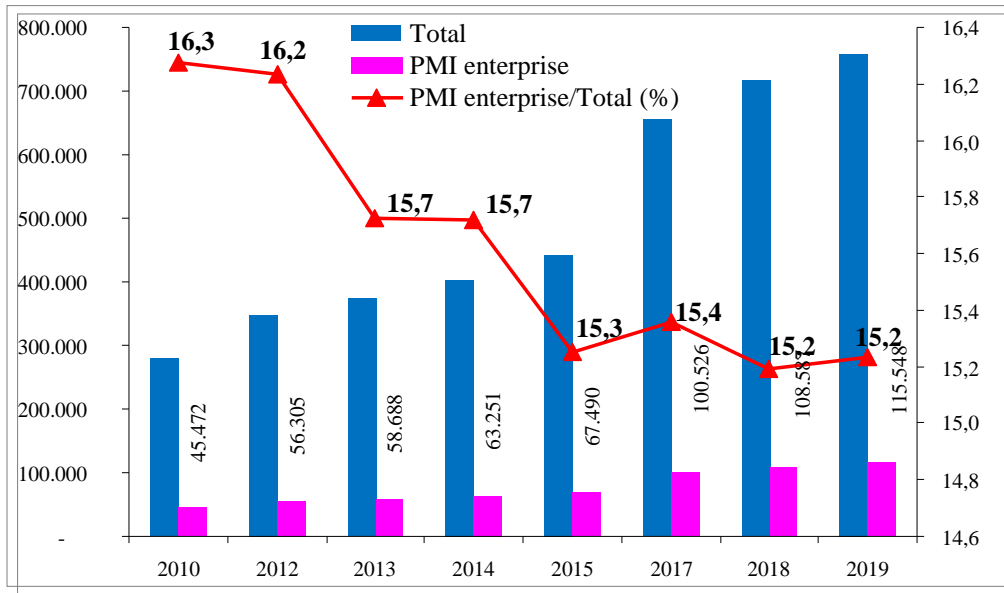


Figure 2: Active processing and manufacturing enterprises (Source: General Statistics Office, 2020)

The Status of Innovation Capacity in Processing and Manufacturing Enterprises

The characteristics of survival and development greatly influence innovation capacity in PMI enterprises. The PMI companies are primarily tiny scale, considering the size of capital and labor. The capital size of PMI enterprises only averaged VND 76.23 billion per enterprise (in 2018). It increased slowly (compared to VND 44.85 billion/ enterprise in 2010). Out of 96,715 PMI enterprises in 2018, 65.4% of companies' capital was less than 10 billion VND; 21.1% from 10 to less than 50 billion VND, and only 13.5% of enterprises over 50 billion VND. Fixed assets and long-term financial investments of each enterprise are at VND 22.21 billion (2010) and, despite the increase, only VND 36.24 billion (2018). The limited size of capital and assets affects innovation, especially investment in technology.

PMI enterprises are still mainly labor-intensive. Indeed, in 2010, PMI enterprises accounted for only 16.3% of the total enterprises in the economy but attracted 4.4 million workers, accounting for 45% of the workforce working in enterprises. The labor-intensive in PMI enterprises tend to increase over time. In 2015 there were more than 6.2 million employees (accounting for 48.5% of the labor force in the enterprise) and grew to more than 7.3 million people (2018).

Table 1

The Situation of PMI Enterprises Operating with Production and Business Results (Source: General Statistics Office, 2020)

	2010	2015	2016	2017	2018
Number of PMI enterprises operating with production and business results	45,472	67,490	75,351	84,142	96,715
Total employees in the enterprise (1,000 people)	4,441.8	6,234.6	6,758.0	7,082.9	7,303.7
Size of labor (person/business)	98	92	90	84	76
Capital of production and business (billion VND/enterprise)	44.85	67.59	68.63	73.65	76.23
Value of fixed assets and long-term financial investment (billion VND/enterprise)	22.21	33.07	33.69	35.10	36:24

Net revenue (VND billion/business)	53 - 56.	86.50	88.68	95.60	95.24
Pre-tax profit margin	2.23	4.24	5.02	5/15	4.31

The majority of PMI enterprises operate in low-tech industries. The proportion of PMI enterprises operating in low-tech sectors in 2010 was 58.65%, and despite the shift to medium- and high-tech industries, 55.46% were in low-tech sectors by 2018. The decrease in the share in the low-tech sector and the increase in the high-tech sector are positive trends. Still, the rate of industry restructuring is relatively slow compared to the requirements for industrialization.

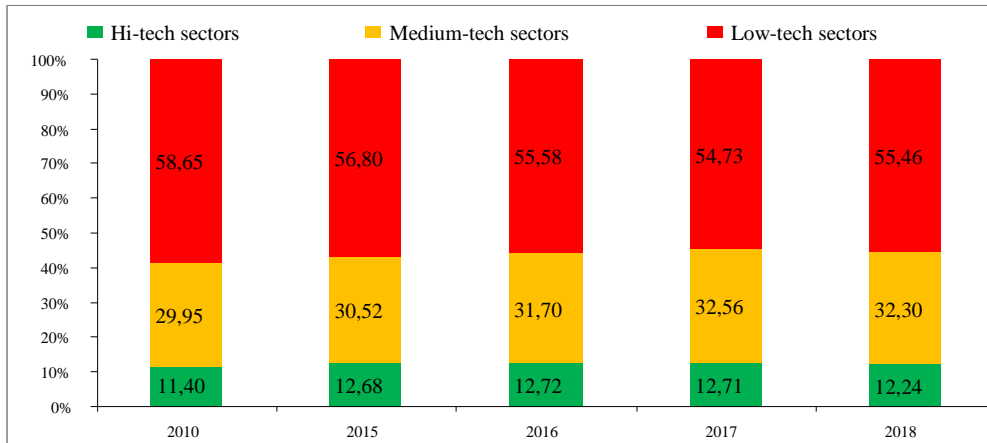


Figure 3: Processing and Manufacturing Enterprises Classified by Technological Level of the Industry

Compared to the general ground, PMI enterprises have better production and business results. In 2010, the net revenue of PMI enterprises averaged VND 53.6 billion/ enterprise, while that of the whole enterprise was VND 26.8 billion; the corresponding figure in 2018 was VND 95.2 billion and VND 38.7 billion/ enterprise (2.5 times less than PMI enterprises). The profit rate of PMI enterprises is also significantly higher than the general ground. In 2018, the figures for the two types of enterprises were 4.31% and 3.79%, respectively. However, the problem is that the profit rate of PMI enterprises from 2010 to 2018 is not stable, and there has not been a breakthrough. The reason is that PMI is concentrated mainly in low-tech and labor-intensive industries. In other words, it relies on the exploitation of cheap labor. Labour productivity, added value, and profitability only surge if innovation is implemented, especially technology and technological innovation.

Innovation is a diversified and comprehensive activity, including innovation of production processes - new technologies used in the production process, product quality improvement, diversification of production products, industry complementation, and transition from the old business sector to the new business sector. Most enterprises apply process innovations (use new technologies to the production process) and improve product quality. Enterprises that innovate production improvement processes participate in enhancing product quality. In 2014, up to 50% of enterprises involved in production process improvement were also engaged in product quality improvement, and 85% by 2017.

The transformation of new business models and new products is one of the innovation activities in enterprises. In addition to capturing trends to transform new business models, businesses can develop new products and services from their traditional business lines.

However, the percentage of PMI enterprises adding and transferring sectors is relatively low. From 2014 to 2017, only about 10% sector supplement and 3% sector transfer (*Figure 4*).

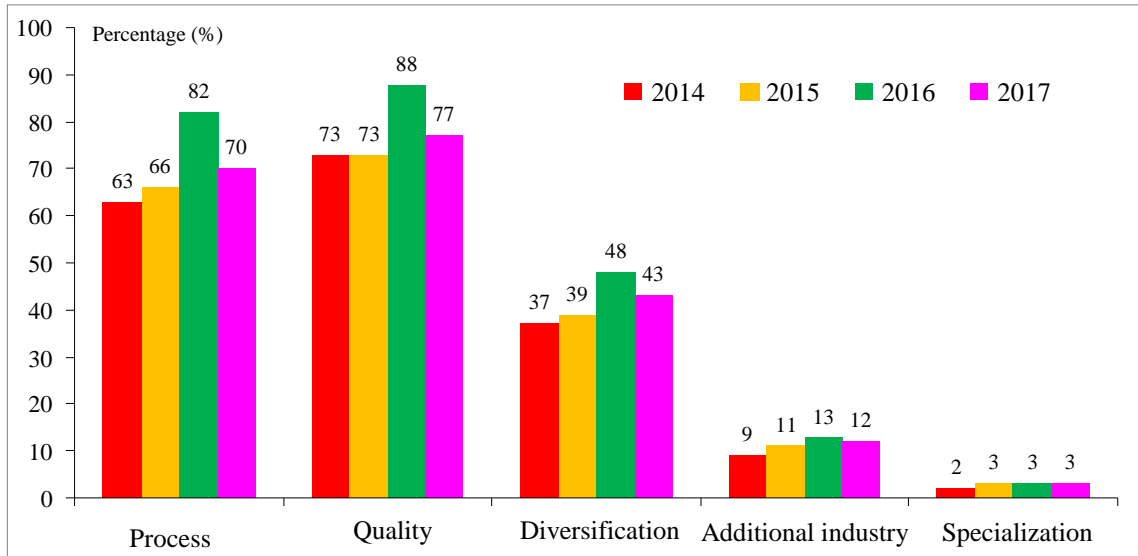


Figure 4: Innovative Activities of PMI Enterprises (Tran Thi Van Anh, 2019)

Although many enterprises have implemented process innovation, most use manual technology, with over 90% in 2010-2017. Although it tends to increase, the percentage of enterprises using automation technology has not reached 10% (*Figure 5a*). The technological level of enterprises is relatively backward compared to the world, and backwardness increases. The proportion of enterprises using technology for less than ten years decreased from about 85% (2010) to 63% (2017) (*Figure 5b*).

Figure 5a: Enterprise's technology

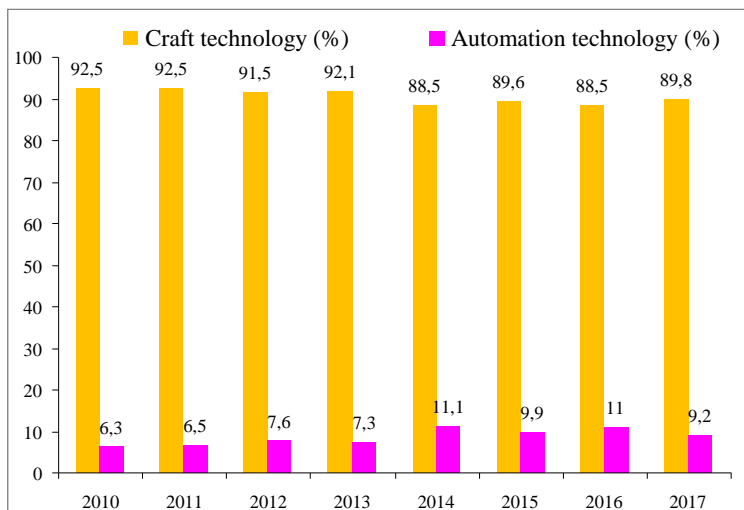


Figure 5b: Technology level of the enterprise

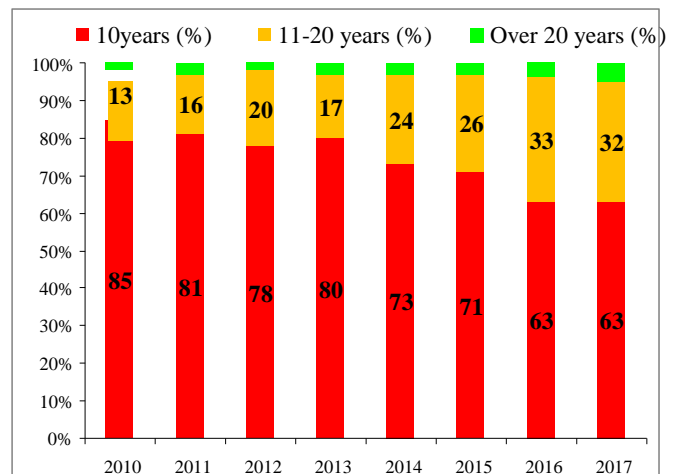


Figure 5: Technological Situation of Processing and Manufacturing Enterprises

(Tran Thi Van Anh, 2019)

Digital transformation in the enterprise is one of the aspects that reflects the operation of the CCP in the enterprise. The Covid-19 pandemic, due to social distancing requirements, forced businesses to switch from traditional forms to digital economy applications and e-commerce activities. However, in light of the needs of the new context, the percentage of enterprises

adopting digital technology is still modest, considering that each type of technology is less than 20% of the enterprises surveyed (VCCI Business Survey 2020).

The trend has shifted from selling products traditionally to online in the digital economy. It can be seen as marketing and sales of the innovation activities. The delay in digital transformation partly reflects the slow step in innovating the sales methods of PMI enterprises.

Recommendation to Improve the Innovation Capacity of Manufacturing Enterprises

Policies to Support Small and Medium-Sized Enterprises

Vietnam's processing and manufacturing enterprises are primarily small enterprises with minimal capital, labor, science, and technology potential. Innovation is focused on creativity with new ideas, so policy measures should encourage R&D activities and investment to improve the level and applicability of science and technology in enterprises. It is an effective way to underpin innovation. Accordingly, the State should focus on the formation of R&D research and development centers. At the same time, the State needs to form a startup ecosystem for the processing and manufacturing industry and prioritize the program to support startups in processing and manufacturing instead of mass support as currently. Governments need to develop groups of solutions and have necessary support policies to encourage digital transformation, digital economy, e-commerce, data digitization, and high-tech applications.

In creating and implementing policies, more attention should be paid to small and medium-sized enterprises to regulate further, scale-up, and improve product and process innovation's revenue share. The percentage of sales of new products and improved products of small and medium enterprises is only 14.2%. The remaining are large enterprises; therefore, the total annual sales of small and medium enterprises are only equal to 1/7 of the total sales of large enterprises. Meanwhile, the number of small and medium-sized enterprises is seven times that of large enterprises. Moreover, most foreign-invested enterprises are large-scale labor enterprises. The sales of new products and improved products of this type of enterprise also account for an essential proportion (74%) of the product sales structure of enterprises. Therefore, it is necessary to promote further the implementation of preferential policies for small and medium enterprises to improve the scale of new products and improved products and improve the total value of revenue from new products and enhanced products of small and medium enterprises. This policy may be a policy to support credit and technological innovation. Still, more attention is needed to mobilize expert forces and scientists to give enterprises technical advice or innovate science and technology programs into targeted programs to support enterprises.

Most of Vietnam's existing enterprises are small enterprises with limited capital, labor, and science and technology potential. Because the nature of the startup is towards rapid growth, the innovation factor is the key to identifying the proper startup. From there, it is necessary to have appropriate incentive policies to help these enterprises stay on track and take advantage of the opportunities of the new development context.

A textile and garment enterprise introduces the most significant limitation of its business when implementing innovation: "The difficulty of many enterprises is a small production, low output, not easy to expand the scale of production and business for export, increase profits. When accumulating large capital, it is possible to boldly invest in new and modern technology to produce more efficiently. That vicious circle needs to be dismantled."

It is also true for many small-scale textile and garment enterprises, which are very dependent

on partners because they manufacture and process on order. Therefore, although the enterprise wants to increase its size and improve the productivity of products, it is powerless. Because fashion constantly changes the trend of products, the investment in machinery and technology is tens of billions of VND, costly but the time spent is too little, not profitable.

Creating a Culture of Innovation in the Enterprise

Innovation needs to be rooted in changing the perceptions and mindsets of enterprises. First from the leader, then from the subordinate. Build a more cohesive corporate culture between people and departments and between departments so that innovation activities are in the right direction and most effective, fast, and powerful. Businesses need to eliminate the ideology of hindrance to change in their business culture, encourage innovations, and build a flexible culture that adapts to market changes. An action that is done for a long time forms a habit. When a new worker comes to work in a new environment that continually encourages creativity, colleagues around them are always creative, forcing that worker to want to survive and also has to adapt, which means constantly innovating at work.

Most importantly, the leader. It is necessary to identify innovation as a long-term, regular process, starting from minor improvements. This process will constantly lead to significant changes by engaging and attracting employees to implement the change process. It is consistent with Kotter's (1996) and Nguyen's (2011) research results.

In addition, there are policies to promote and build a culture of creativity in the business, thereby stimulating creativity and passion in the industry. After all, developing a creative culture in the enterprise will create the role of individuals, collectives with infinite wisdom and power unique, different, high-added value products, contributing significantly to promoting growth in the enterprises themselves.

Innovations are great content to help enterprises process, manufacture, and develop. Innovation needs to be rooted in changing the perceptions and mindsets of enterprises. Innovative innovation in enterprises uses digital technology to automate and smarten up production, business, and administration processes. In the past, the power of enterprises was many people, and now, the emphasis is that few people react, move quickly, and take new approaches in all activities.

Strengthening the Cooperative Relationship in the Enterprise

Vietnamese enterprises rarely cooperate with external enterprises or research agencies in technological innovation. Almost enterprises carry out the process of technological innovation within enterprises.

The current situation shows that enterprises are still "closed" in product and process innovation. The level of cooperation with external organizations to study product innovation and process innovation is low. In addition, enterprises do not highly appreciate the role of public research organizations and higher education institutions in cooperating and supporting the enterprise's activities. Therefore, it is necessary to study policies to encourage enterprises to cooperate with others or with scientific and technological organizations in scientific research activities. The study included criteria for assessing the level and effectiveness of cooperation of universities and research institutes with enterprises in the evaluation criteria system, classification, and ranking of science and technology organizations.

It is necessary to strengthen the links between enterprises and universities and research institutes in a business-centered manner; universities are research subjects, considering research as a mandatory task.

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