The Equipment Manufacturing Industry Supply Side Reform and Innovation with E-Commerce Platform

Yan TANG\textsuperscript{1,a} and Yong-min JIANG\textsuperscript{2,b,*}

\textsuperscript{1}Department of Electronic Commerce, Sichuan Vocational College of Science and Technology, Chengdu 610031, China
\textsuperscript{2}Department of Mechanical Engineering, Chengdu Technological University, Chengdu 611731, China
\textsuperscript{a}zhuizhuba@163.com, \textsuperscript{b}825182196@qq.com
*Corresponding author

Keywords: The equipment manufacturing industry, electronic commerce, flexible manufacturing, product innovation.

Abstract. E-commerce has become the emerging business model, has been widely accepted by the particularity of the manufacturing e-commerce still need to study. E-commerce innovation brings new opportunity to the development of manufacturing industry, to promote the traditional manufacturing industry upgrading and adjust the structure of manufacturing industry. Facing the rapid manufacturing industry transformation, fast development of electronic commerce, electronic commerce development policy to encourage such as background, manufacturing e-commerce development innovation is on the rise, electricity to the manufacturing enterprise organization flattening structure, digital design and production, enterprise competition mode, enterprise risk control have great influence and role. The results show that the electronic commerce enterprise product innovation affects the business performance; Market information to promote the electronic commerce enterprise product innovation, as a result of manufacturing electrical business development in China is facing the manufacturing quality problems, distribution channel conflict, lack of the inter-disciplinary talent, in this paper, speed up the development of manufacturing electric company, to promote research and development innovation, the implementation of flexible production, build brand advantage. Through theoretical analysis and empirical research, it is that a good way to promote the development of manufacturing.

Introduction

Traditional manufacturing industry, from the point of the supply side, the independent innovation ability is weak, the industrial structure is unreasonable, low efficiency, high cost; Even with the electronic commerce, still keep the old mode of product development and marketing, will focus only on the product level, still no form with the organic link of the market. It rooted in the use of information resources and coordination problems. It is necessary to adopt the method of Internet +, e-commerce platform development, to product innovation, to the market, to the user, to the enterprise value chain and even to the whole business ecosystem to review and study, the benefit growth transformation.

Sun Bailin pointed out equipment manufacturing enterprises "by the production manufacture to a service-oriented transformation, is the trend of global manufacturing development. In the future, the equipment manufacturing industry guide consumption to meet the market development. Jin Wei put forward the thinking mode of Internet + as a driving force to promote the development of equipment manufacturing enterprises improve and traction, said Zheng De and so on, highly competitive strength of the e-commerce market will improve enterprise's product innovation tendency, and not weaken the business performance of product innovation. Zheng-chu He etc., points out that the manufacturing electric business development is facing the manufacturing product quality problems, distribution
channel conflict, lack of the talents, therefore, from the emphasis on research and development innovation, the implementation of flexible production, establishing the brand advantage and so on countermeasure to speed up the development of manufacturing electrical contractor. Although, the research achievements of domestic and foreign scholars have made manufacturing e-commerce, but in the use of e-commerce specific problems still exist in the implementation of reform and innovation.

E-commerce (Electronic Commerce or EC) is to point to: through the use of the Internet or other Electronic tools for business trade activity. Based on computer network, we can undertake a variety of business activities, including product design, manufacturing, advertising, sales, service, the sum of consumption and related behavior. E-commerce brings new opportunity to the development of manufacturing industry: in the field of production, security design and manufacture and market of organic connection, achieve precise production. In the field of circulation, the use of network makes the propaganda, ordering, delivery, maintenance becomes easy. Electronic commerce is to adjust manufacturing industrial structure, promote the traditional manufacturing industry to upgrade the important means. After the practice proved that further development of e-commerce platform, is the commodity of the important methods for the design, manufacture innovation.

**Manufacturing Electric Business Problems**

Long effective period, because of the large manufacturing fixed investment, output lagging behind the market demand for a long time, productive investment orientation of industry policy support is insufficient, the financial market is not standard, lead to lack of funds, the manufacturing innovation power shortage.

In recent years, labor costs increase, wages rose sharply, lost the original profit space, a large number of overseas companies to India and southeast Asia countries. The collapse of the coastal regional manufacturing is a big time. According to statistics, the collapse of cell phone contract is 19. It is only in a microcosm of Chinese manufacturing industry in 2015, star enterprise collapse, because money is tight, the overall decline in performance, 70% of the factory default employee wages, China's manufacturing enterprises face significant funding problems.

Due to the international market competition, the traditional manufacturing industry profits further compression, as foreign companies pouring into and rapid change of the production, trading patterns, manufacturing enterprises are faced with the increasing market competition, lower profits, market development and keep increasing difficulty.

**Manufacturing Design Innovation and Product Quality Problems**

Economic growth is slowing, traditional manufacturing first hit. Some rely on low price and quantity accumulated to obtain profit of the enterprise survival crisis. Is a new way to technological innovation and improve the quality of products, from the aspects of supply side removal capacity to alleviate the crisis.

Because of the economic poverty for a long time, the first choice of consumers always cheap products, so, made in China is basically a low price low quality manufacturing, high quality products in China, the basic no, today, the economic level and the improvement of living standards, consumption trends tend to high quality products, people choose the first standard is quality, not price. As a result, the Chinese set up the world's largest shopping, buying German kitchen knife, rice cooker, hair dryer, toilet cover of Japan. Reason is that the foreign product design in line with the market need, the use function. For industrial equipment are more willing to believe that quality is higher than the domestic, abroad buy outdated television production line, auto production line, mobile phone production line, gave up the design innovation and quality improvement. So people began to abandon the "domestic", spend Qian Gong devoted to foreign manufacturers.

Although Africa, Latin America, southeast Asia has a large number of the mechanical equipment made in China, but the overall technology level of manufacturing industry is still at a relatively low level in the world. In auto industry, for example, although some of the independent brand automobile
manufacturers has begun to overseas, set up a production line in South America and Africa investment, but as a result of product quality control, after-sales service, such as problems, lead to good reputation in the market is difficult to establish, so in the host country can only borrow from the host country or another brand.

**Developed Manufacturing Electric Business Platform**

Special place of Chinese electricity industry platform, is to fade in sales monopoly, and strong, vulnerable, sellers in the past with the help of electricity channels relative offline cost advantage, sellers enjoy a lower cost of sales bonus, dividends now disappear. Electric business platform originally cost advantage. Traditional manufacturers make electricity channel is necessary. So that users with factory two straight line connection, remove the middle circulation, connected directly to the designer and manufacturers, realize C2M mode, from the customer to the factory directly. C2M pattern makers need to meet four conditions: one is the top manufacturer, 2 it is to follow the pricing strategy of platform 3 is the best designer and cooperation, four is with flexible manufacturing chain. Represented by "private custom" C2M after a period of time of development, product scope expanding gradually, choose this option also gradually more populist. But for manufacturing enterprises, private custom seems attractive, but highly demanding. Traditional production line to achieve personalization, need to pay a high cost, and for electric business platform, private custom pattern is faced with the problem of cooperation manufacturers. Custom factory cooperate with production and a large number of orders to ensure profits, to move the supply chain, the more need a lot of consumer data as custom service technical support, to grasp the user needs. C2M trend in the automotive industry, for example, have. The past only a few configuration to choose from, each car now, from the engine such as power plant to the inside and outside decoration such as seats, paint color and material can be customized by consumers personalized demand. Now BMW 5 series, for example, the customer can choose the types of configuration is as high as 30000 species, so on the production line of the BMW 5 series, possible production car a month are not the same.

**Brand And Electrical Business Competition Issues**

With the comprehensive upgrade of manufacturing industry, manufacturing various niche monopoly formation, contract start threshold and costs have been rising, and upgrade quality demand, the product cost is increased. Due to the development of the enterprise electronic commerce, the factory directly to the user, product prices to fall.

Product prices will face greater competition, only do online sales of electricity sellers, will be enveloped. On the one hand, their purchase cost rising, on the other hand also hit from rising new brand, sales on the decline. With brand name products, with electric business platform enterprise is likely to stand the test of market competition. If the enterprise did not own brand products, the added value of the product is low, the enterprise product price decision is difficult to grasp in their own hands. Business development in the past, are in the infancy, fewer competitors, electricity only on price, convenience and advantages of pre-sale service can compete with traditional channels, and now electricity among competition has become operational ability, talent and management efficiency of competition, competitive costs to rise again. With online not like offline channels to establish monopolies and then participate in the competition is harmful to the brand image of enterprises, and not to participate in the competition and will cause the enterprise to be eliminated directly. Fortunately electricity has not come in the winter, some manufacturers began to consciously to integrate resources to build the brand, make use of the O2O mode remodeling industry chain.

Website construction is also many weakness of the electric manufacturing business. Many manufacturers because there is no construction, optimizing the web experience, causing the site to incomplete information, interactivity, poor to navigate and search function is not comprehensive, the emergence of the problem such as slow speed, based on the web browsing information to the customer's needs and preferences analysis is not accurate, led to the loss of customers and users to expand.
Manufacturing Industry Informatization Level

"Made in China 2025" strategy of the main line is depth fusion, information technology and manufacturing technology development of digital, networked, intelligent manufacturing. As mobile communication technology of world industrial structure adjustment and substantially in China based on the Internet, the Internet and cloud computing O2O wisdom industry of booming development, mobile Internet and Internet financial electric business platform and created good conditions for manufacturing innovation.

A new generation of e-business has paved the way for the intelligent manufacturing technology, the Internet financial provide enterprises with a low transaction cost of business model, but the electronic commerce and the integration of manufacturing process, methods, how to effectively improve the efficiency of integration degree and, still need to explore and improve. The fusion of informatization and industrialization and collision will bring a series of relations change, including "personalization" solutions, customers to participate in innovation, etc. "Manufacturing" + Internet can provide a new platform for the traditional manufacturing industry, new client relationships and new mode of supply chain, etc., so as to realize the intelligent transformation of business model.

In most of the manufacturing enterprises in our country enterprise has not been widely used in electronic commerce technology, enterprise internal and external information transmission efficiency is low, the enterprise management and decision-making, such as low efficiency, slow market reaction, the new network management model, the informationization level is still 2.0 times in the industry. Manufacturing industry of our country electric business information security problem difficult to solve, especially large manufacturing, in order to avoid unnecessary loss, the electricity information security have higher requirements, and the transaction security, authentication technology, data encryption, and money transfer online technology also is not very perfect, there are some information security hidden danger.

Product Distribution Channel Conflict

Manufacturing value chain from r&d investment, production and finished products of logistics management, marketing and sales. Usually, the traditional manufacturing is done through offline activities of research and development production and sales link, however, the Internet provides the manufacturing a set up on a global scale sales system and direct relationships with customers, in the face of competition, profit pressure and market new problems, such as reaction time, pushed manufacturers more online, to accept the new test. Including the production process of electronic commerce will be a big change, the future of manufacturing electronic commerce value chain: research and development, online booking, online sales and production at the same time, raw material logistics management and assembly, order execution, and online after-sale service.

New business, new methods, new channels, make the enterprise faced with many difficulties and risks.

Manufacturers increasingly will be transferred to the online marketing, sales and design steps, use according to the production orders, while reducing the risk of investment and inventory, but the market, capital security, technology, management, and risk of customer loyalty, etc. For manufacturing enterprises, set up online sales channels could lose some cooperation wholesalers and retailers, worsen the problem of channel conflict, which could lead to the original customer churn. Without opening up online sales channels, and may lead to consumers turn to other makers of direct selling products on the Internet, thus lost earnings.

Manufacturing Compound Talents Loss Problem

Enterprise mainly through the exhibition to the customer in the past, but in recent years, many companies say shows the number of customers less and less, then began to conduct electricity activities, expand the market, follow up and supporting services also can't keep up with, however, many enterprises excessively put attention on the production, marketing, technology improvement, management, etc.
Do not attach importance to the introduction of talent, more not to establish a reasonable mechanism of employing, leads to poor stability, the brain drain. High-quality talents for enterprises to improve not only to design, improve the efficiency of management, mining enterprise culture can help small and medium-sized enterprises (SMES). And e-commerce, on the other hand, the current situation of the hot contrast, due to the electronic commerce is related to computer, management, economics, law and so on several basic cross new disciplines, many schools to cultivate this kind of practical talents have no experience, also has not figured out a set of reasonable training mode, in the direction of professional training, teacher team construction and the problems still exist in the curriculum and so on, caused the disconnection between theory and practice, electronic commerce graduates do not have enough skills to meet the social and market demand, other professional counterparts, the employment rate is far lower than ordinary colleges and universities.

Manufacturing Electric Business Innovation Methods

Manufacturing Product Development Innovation

Supply side reform requires transformation and upgrading of manufacturing, and manufacturing ability of supply has failed to keep pace with growing consumer demand change and growth. The Internet platform for the big data, provides a way to understand consumer preferences and consumption habits, transformation and upgrading of manufacturing should be actively using the Internet, the development channels of product innovation and the electricity consumption.

Learning advanced technology. Through learning and imitation and secondary innovation mode of the technology development of the enterprise. Attaches great importance to the independent intellectual property rights, carry out technological innovation, to achieve the leap development of technology for manufacturing enterprises improve product quality, build core competitive advantages. Competitive advantage can not only effectively promote the evolution of business models, gradually narrow the gap between the business model in our country and developed countries, more can realize China's manufacturing industry innovation drive, improve the efficiency of manufacturing production, perfect manufacturing environment. While encouraging does not have the traditional manufacturing enterprise independent innovation conditions, can make full use of network resources, speed up the informatization construction, improve the integrated ability of electronic commerce for resources.

Shorten the product development cycle. In order to ensure that the diversification of products, at the same time dealing with the workload and the increase of the span, manufacturing industry should step up research and development efforts, increase R&D investment, introduce the design of the product and manufacturing process and related cross multiple tasks of concurrent engineering, do the work needed to resource sharing, shorten product development cycle.

Relying on the research and development and design, improve product features. Pay more attention to in the process of service product added value, the promotion industry technical knowledge and the quality level of the enterprise, the product appearance, function, structure of the innovation design and the effective improvement.

Flexible Production

More popular in the world of flexible production mainly include lean production, concurrent engineering, agile manufacturing and intelligent manufacturing it several ways. Agile manufacturing structure dynamic changeable, give full play to the highly flexible integration of technology, organization, personnel, its characteristic is pay attention to adapt to the requirements of rapid change. Intelligent manufacturing the first generation of IM, and the second generation of CLM (H IM) is put forward by Japan and Germany respectively. CLM focuses on "people" in the production of flexible decision, will improve the decision-making into for development purposes, and promote through intelligence activities in the whole manufacturing process.
The basic characteristics of the flexible production is according to the market demand for production, to meet the product quantity, strong character, high level of diversification of production requirements, is bound to create multiple running water production line, different categories of products with different production line. But the mode of production complex is easy to cause high cost of production, management and so on, therefore, must establish a flexible manufacturing system, on the same production line equipment to adjust to different kinds of batch production task, which meet the less quantity, batch and many varieties, diversification requirements, and to maximize the use of equipment assembly line. At the same time, the flexible production must be in the same location to finish the whole production process requirements, with instant access and meet the market demand, and dynamically adjust the production according to market. Especially the parts supplier and the assembly plant, should be to reduce the distance between in a timely manner to ensure the spare parts delivery, reduce inventory, so as to realize the sensitive response of changes in market demand.

**Improve Product Service, Build Brand Advantage**

Manufacturing shall conform to the trend of production technology of service innovation and improvement of the supporting services, and to encourage manufacturing all kinds of innovation and research and development on e-commerce, according to the demand of the development of seeking breakthrough in the field of electronic commerce, explore new development path, in brand planning and marketing innovation, enhance the level of manufacturing industry on the mastery of knowledge and skills.

Different from traditional business centered on products, electric dealer market based on user needs as the center.

Manufacturing enterprise shall, through the electronic commerce to the upstream and downstream enterprises, improve enterprise's response to market demand for speed, thus win the market. Control of big businesses can create electricity dealer market alone, small and medium-sized enterprises can take the form of enterprise alliance, or joint, the downstream enterprise on the formation of the joint venture company. Enterprises should implement each link of complete information and complete the chain from design to manufacturing to sales, closely linked to the enterprises in the chain from the information to the interests of the dealer market for electricity to form the agile reaction, the user needs to quickly feedback to the front from the end of the chain, forming a "design to complete manufacturing, according to the requirements in a timely manner to adjust to market" rapid response, and then use familiar with electrical business channels and understanding of the needs of customers, gradually turn to product upgrade, make the development direction of product competitiveness and brand value.

**Product Marketing Innovation**

Set up and perfect the enterprise own website, provide more unique products and services, update company news and show common problems and solutions, forming a good interaction between company, customers, and constantly optimize web pages, improve site navigation and search capabilities. At the same time, enterprises through the consumers to browse the web habits and browsing history, etc., can understand based on individual consumer buying preferences, etc., offer product design, set up a "one-to-one" relationship, avoid customer churn. Enterprise can also through the establishment of customer, as a virtual community for commodity instant communication and feedback, timely help enterprises to improve the products and cultivate customer loyalty. Enterprise must have a broader view of self-built e-commerce site, site early benefits may not be significant, but in the long run, the enterprise can through the website, strengthen the communication with customers, to provide customers know the effective way of enterprises and products, so as to improve customer purchase rate. 2 it is to the construction of e-commerce system. Through the integration of online order system and logistics system, to meet customer demand for time sensitive, shortening the time of return, to realize the seamless connection before and after the end.
Traditional dealers, however, is still the manufacturer to decide whether to open up online direct sales channel of a concern. On the one hand, multi-channel sales can make manufacturers to meet the needs of multiple market segments, and sell more products, and to maximize the efficiency of production line, on the other hand, online sales are likely to make a manufacturer itself is the dealer as a competitor, lead to channel conflict, and distributor of revenge. Whether in manufacturing electric suppliers establish online direct marketing channel decisions may consider the following aspects.

When manufacturing enterprises set up online sales channels, can be the difference of the production line on line products, to avoid direct competition with little scope to modify the product, or an independent sales team to avoid channel conflict. At the same time, enterprises should consider the new channel of core business part and the influence degree of the service market, and destruction of channel's impact on corporate profits. Manufacturer analysis of channel conflict occurs the importance of destructive possibility and threatened the channel, the great threat to locate conflict, take emergency measures, threat for solutions to look for opportunities.

The Empirical Study of E-Commerce Impact on Innovation

Customers Involved in Innovation "Electricity + Manufacturing" Fusion Model

Part of Wenzhou business started trying to separate online mall, and paid attention to the value of potential, gradually establish differentiation advantages, such as the method of group online customization sales model, Zhejiang high electrical set up customer interactive platform, the enterprise will be more easily from the prop store explore O2O mode, through data analysis, to capture the consumer's age distribution, characteristics of consumption habits, hobbies, etc., and in turn to make accurate product positioning and adjustment. Wenzhou minister Internet appliances is one of the main life household electrical appliances enterprises. Originally with the aid of e-commerce sales of small home appliance, enterprise focus on mining and analysis customer demand characteristics and information in e-commerce transactions, the feedback to the product development system, small sample accumulating small group characteristics, into information technology to optimize product design, customized procurement and affix its own brand, has gradually become the new benchmark for personalized small electrical appliances market.

"Wenzhou Mode" E-Commerce Features

(1) the electronic commerce in Wenzhou embodies the advantages of origin online shopping goods. Wenzhou electrical business mainly depends on the manufacturing industry agglomeration, have online supply of goods country of origin and price advantage, focus on shoes clothing, handicrafts, electrical industry, fasteners and so on characteristics. Such as county (with more than 8000 individual electricity) depends on the gift industry agglomeration, Yueqing city, has more than 8000 individual electricity) based on electrical industry agglomeration.

(2) the electronic commerce still is given priority to with "business". In the survey of 240 enterprises in Wenzhou, the main purpose of conducting e-commerce is to increase sales and sales area, the mode of production, organization and management aspects of the guide didn't show up. This match the traditional commercial culture in Wenzhou, e-commerce as a sales tool, in the growing network transparency still is given priority to with price competition in the market, regardless of the small profit, sales for the king.

Through the collection of China's largest B2C platform Tmall mall in 300 e-commerce companies, multiple regression analysis method is applied to the empirical e-commerce market characteristics affect product innovation.

The results show that the electronic commerce enterprise product innovation affects the business performance; Market information to promote the electronic commerce enterprise product innovation, but their usefulness by reverse regulation of the intensity of competition; Competition strength significantly strengthened e-commerce enterprise's product innovation tendency, and will not affect the enterprise innovation performance, because in the current e-commerce development stage and
characteristics under the influence of e-commerce market, product innovation to schumpeter rents, the leading product innovation is the competition from effect rather than the schumpeter effect!

Inspection e-commerce market environment for e-commerce enterprise product innovation and enterprise performance is consistent with the traditional market research, the influence of electronic commerce enterprise in the online market through product innovation can effectively improve business performance. But unlike traditional market, highly competitive strength of the e-commerce market will improve enterprise's product innovation tendency, and not weaken the product innovation performance of enterprise, even if the product is less innovation belongs only to incremental innovation of easily imitated by competitors. This is partly because the e-commerce market is in rapid growth, customer demand rapid growth make innovative products have enough market space for innovators and competitors. In this sense, the electronic commerce enterprise's product innovation should be the customer oriented rather than competition oriented.

Conclusion

Chris Anderson in the United States put forward "the long tail theory", "in the information age, each enterprise should be low cost to provide high quality products, high quality products to help users find what they need".

Enterprise how to reduce the product cost, enhance their competitiveness? Break the existing closed-end mode of development, the use of electric business platform to understand customer needs, simplify the development, the production process, to shorten the development period of product development and design;

Allows users to personally participate in the development of new products in the process, ask questions to each other, discussion, design can truly meet customer's real demand, and promote product design and product quality, quality to the acme, universal product carrier to help users solve their real problems;

Establish a communication platform with users: use Chat, weibo, text messages, BBS, social networks, etc., the user and the designer to communicate face to face. Through communicate with users in the communication platform, to promote the new product development, might have test many times, in no before the release of users and put forward modify opinions.

Online payment and settlement and after-sale service, etc. Main trade type enterprise and individual trading (B to C) and a transaction is between companies (B to B) two kinds. Participate in e-commerce entities have four categories: customer (individual consumer or enterprise group), the merchants (including distributors, manufacturers, storage and transportation), bank (including card issuers and single line) and certification center;

References


