

Title	製造業の新製品開発プロセスにおけるMVP ( Minimum Viable Product ) の有効性の検証
Author(s)	長野, 駿
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# **Verification of MVP (Minimum Viable Product) effectiveness in new product development process in manufacturing industry**

Shun Nagano

School of Knowledge Science,  
Japan Advanced Institute of Science and Technology  
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The external environment surrounding the recent market is constantly changing rapidly. In 1955, the life expectancy of S&P 500 constituent companies, which had been on average for 61 years, has shrunk to an average of 17 years in 2015. As evidence, in the past 15 years 52% of S&P 500 constituent companies have been culled out by disruptive innovation. Also, it is reported that since the product lifecycle has been shortened to one-quarter in the past 50 years, the input of new products are inquired for the previous product will be replaced by competing products to market within a few years or months. In this way, companies are forced to develop new products in an environment where many enterprises have been culled out by destructive innovation, while the product life cycle is extremely shortened, and the speed of dissemination of new technology is rapidly expanding,

Also, there are reports that on average, new products account for more than a quarter of corporate sales, and in the fast-moving industry there is a report that the percentage will rise to 100%. However, it is also reported that 95% of new products in America and 90% in Europe fail. According to this, it is suggested that the new product development has a dilemma that it is a corporate activity with a very high risk of failure, while its success obtains great profits for companies.

Also, it can be said that in the market in recent years, there is an increasing need for proactive marketing methods to speed up the development of new products and reduce the risk of failure of new product development.

In recent years, utilization of Lean Startup has been spreading mainly in the software industry. In this research, we focused on application of MVP, which is a practical way of Lean Startup, to the manufacturing industry. Therefore, the purpose of this study was to verify the effectiveness of MVP in the new product development process of the manufacturing industry. And, the MRQ in this study is created as "What is the effective way to use MVP in the manufacturing industry?"

First of all, 10 manufacturing companies that are developing new products and 1 IT companies are

interviewed to clarify how MVP is used for. By using qualitative analysis software MAXQDA for cases utilizing MVP, we can clarify the trend of MVP utilization in manufacturing industry. Also, by conducting an interview survey of IT companies at the same time, we will clarify the difference in utilization of MVP between IT companies and manufacturing industry. After that, based on qualitative data analysis results, we conduct a questionnaire survey on 24 manufacturing companies and 13 IT companies. Subsequently, an interview survey will be conducted additionally for cases similar to qualitative data analysis results. Finally, comprehensive analysis is performed on the collected data.

As a result of the above, it turned out that the way of utilizing MVP is greatly different depending on the business situation, product and production system. From that, we presented the type of MVP utilization "Type: B2B", "Type: B2C", "Type: B2C-CF".

B2B manufacturers that manufacture durable goods such as office furniture and food and fables communication equipment have been allowed to utilize single use case MVP. This was presented as "Type: B2B". In addition, from the GE FastWorks efforts, it was suggested that even single-use product such as aircraft engines could make use of single use case MVP by additive manufacturing.

B2C manufacturers like IO DATA which produce products with short development time such as technologically intensive products based on fables production, or leather products, have been approved for the utilization of MVP, which has not been recognized until now. This was presented as "Type: B2C". Also, among B2C makers, office stationery makers used pre-order MVP which was presented as "Type: B2C-CF".

As a comparison between MVP utilization method of manufacturing industry and IT companies, the agreement between MVP building stage and IT companies of precedent case was confirmed in this interview and questionnaire survey. It was also suggested that the MVP building stage of B2C manufacturers tends to be building MVP at a later stage than IT companies. In many of the manufacturing industries that conducted the questionnaire survey, the MVP building stage was concentrated in the "product planning" and "development" phases. In addition, the MVP building stage of the IT companies is later than manufacturing industry, and the result opposite to the preceding case was obtained. From the results of this questionnaire, it is suggested that many manufacturing companies and IT companies are not able to fully utilize MVP.

Above all, this study has two significances. The first one is that this research suggests that MVP utilized in the manufacturing industry can improve the development speed and reduce failure risk. The other one is that it presents different utilization types of MVP.

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