Summary of the FY2017 White Paper on Manufacturing Industries (*Monodzukuri*)

> - Business administrators of manufacturing industries are facing dramatic changes in the environment surrounding such industries. The FY2017 White Paper on Manufacturing Industries clarifies concerns that business administrators should share and two major challenges in addressing this situation. In addition, it indicates the directions of responses to them.
> - The White Paper also presents an enormous amount of successful cases, for example, nearly 100 case examples are cited in Chapter 1 alone.

1. Outline of the "White Paper on Manufacturing Industries"

The White Paper on Manufacturing Industries is a statutory report based on the Basic Act on the Promotion of Core Manufacturing Technology (enacted under the sponsorship of lawmakers and put into effect in 1999). This is the 18th annual report, jointly written by the Ministry of Economy, Trade and Industry (METI), the Ministry of Health, Labour and Welfare (MHLW) and the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

2. Contents of the FY2017 White Paper on Manufacturing Industries

Part I Current Status and Challenges of Manufacturing Infrastructure Technology

   Chapter 1 Challenges facing Japan's Manufacturing Industries and Its Future (METI)

   Chapter 2 Securing and Developing Manufacturing Human Resources (MHLW)

   Chapter 3 Education, Research and Development Supporting Manufacturing Infrastructure (MEXT)

Part II Policy Measures Taken in FY2017 for Promoting Manufacturing Infrastructure Technology

3. Key Points of the FY2017 White Paper on Manufacturing Industries

1. General

The White Paper clarifies concerns that business administrators should be aware of in order to properly address dramatic changes in the environment surrounding manufacturing industries.

(1) Business administrators' efforts to address fundamental qualitative changes in human resources and quantitative labor shortages might be inadequate.

   (e.g., changes in human resources skills, digital human resources shortages, need for systemic thinking)

(2) Some points that hitherto have been viewed as strengths might become impediments to reform.

   (e.g., Negative effects of coordination-based approaches, overemphasis on customer requests, and overconfidence in quality)

(3) Business administrators might have not be adequately aware that they are in the midst of an extreme transformation such as digitalization of economic society.
 (e.g., misconception that an information technology boom has come again, complacency with present brisk orders)

(4) Business administrators might have failed to recognize a need for discontinuous reform.
 (e.g., Limits of self-sufficient approaches, dependence on bottom-up administration)

2. Major Challenges

The White Paper clarifies two major challenges that business administrators in Japan's manufacturing industries should address after sharing the abovementioned concerns, based on an analysis of a questionnaire survey conducted by the Ministry of Economy, Trade and Industry in late 2017

Major challenge 1: Need for maintenance and enhancement of workplace c productivity, development and securing digital human resources, in order to address growing labor shortages.

Major challenge 2: Need for obtaining added value in response to new environmental changes amid the relativization of competitive sources in the context of production of goods

3. Directions of Responses

Major response 1: Measures for maintenance and enhancement of workplace productivity, development and securing digital human resources

· The White Paper recommends the integrated promotion of "the utilization of digital tools," "human resources development (human resources development revolution)" and "working-style reform" and directions of relevant initiatives while citing numerous successful cases.

· The White Paper emphasizes the need for building new "workplace productivity," that is capabilities to address the digital age amid growing labor shortages, such as digitalization and systematization of quality data and human knowledge, and transforming them to an organization's resources. It also states the need for "business administration capabilities" to lead such efforts, while citing successful cases.

· In addition, the White Paper emphasizes the need for business administrators to take leadership in developing mechanisms for avoiding falsehoods and securing traceability for guaranteeing quality to enhance quality assurance systems, while citing actual cases.

Major response 2: Measures for improving added value in response to new environmental changes

· To demonstrate the importance of promoting the Connected Industries Policy, the White Paper broadly classifies more than 70 case examples from the viewpoint of consumers as end users in

an easy-to-understand manner. It also explains solutions offered by the examples in order to overcome challenges, and how "connections" between something else worked in the solutions.

· On cybersecurity measures as a common challenge for promoting the Connected Industries Policy, the White Paper analyzes current states of manufacturing industries based on the abovementioned questionnaire survey. It emphasizes the need for making cybersecurity promotion arrangements, including stimulating small and medium-sized manufacturers' awareness and securing human resources, and also introduces promotion measures.

· On systemic thinking and total optimization as similar common challenges for promoting the Connected Industries policy, the White Paper introduces successful cases that overcame problems in which business operators could easily take the plunge into, as well as present relevant case examples.

· As other common challenges of manufacturing industries, the White Paper states the need for diffusion of initiatives utilizing startups and ecosystem-based development while citing successful cases. Moreover, it states analysis and solutions on shortages of human resources for diffusing the Connected Industries Policy for local, and small and medium-sized manufacturers.

The White Paper urges business administrators to take leadership in promoting these solutions.