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Evaluation method for enterprise intelligent manufacturing performance and capability

企业智能制造效能评测方法

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5 Evaluation Principles

5.1 Normative Principles When conducting intelligent manufacturing performance evaluation, refer to the evaluation requirements, evaluation indicators, evaluation methods and procedures, and evaluation reports specified in this document. The requirements of the notice shall be followed.

5.2 Comparability Principle When selecting evaluation indicators, the level of industry development should be considered to ensure that the definition and calculation methods of the evaluation indicators are domestically and internationally recognized. International

comparability, as well as the uniformity of the calculation measures and methods for the selected indicators.

5.3 Operability Principle Each indicator within the indicator system should be clearly defined in concept, simple and easy to understand in expression, easy to obtain data, and easy to quantify, so as to facilitate implementation. Actual operation.

6 Evaluation Requirements

The evaluation of enterprise intelligent manufacturing efficiency should determine the evaluation objects and statistical periods.

---The architecture of the evaluation object should comply with the provisions of GB/T 37393 or GB/T 41255, and the evaluation object should be before and after the modification. Manufacturing units of similar size and producing the same type of products. For newly built smart factories, data before implementing smart manufacturing can be referenced from peers. Industry-related indicators.

---The statistical period should be a specific period (such as day, week, month, quarter, year, etc.) within the same unit before and after the implementation of intelligent manufacturing in the enterprise. A yearly period is preferable. As a statistical period. The statistical period before implementation should not exceed 3 years from the start of intelligent manufacturing implementation, and the statistical period after implementation... The implementation of intelligent manufacturing should be completed within 3 years. The evaluation metrics are detailed in Chapter

7.Among them, the general evaluation metrics are applicable to all manufacturing models and should be used in the process of evaluating the effectiveness of intelligent manufacturing. Prioritize the use of specific evaluation indicators; tailored evaluation indicators can be selected based on the company's own circumstances.

7.1.1 Production Efficiency

7.1.1.1 Indicator Description Production efficiency is a key indicator that measures the effective production output of a unit of manufacturing/object per unit of time. Its specific characteristics include This refers to the output efficiency of qualified products within a certain statistical period. The rate of change in production efficiency reflects the degree to which production efficiency changes over time, and can be used as... It is used for quantitative analysis of increases or decreases in production efficiency.

7.1.1.2 Calculation Method Production efficiency is calculated using formula (1) or formula (2).

7.1.2 Resource Comprehensive Utilization Rate

7.1.2.1 Indicator Description The resources referred to in this document are the raw and auxiliary materials used in the main production process. Resource comprehensive utilization rate refers to the rate at which an enterprise utilizes resources during the production process. The comprehensive utilization efficiency of various main and auxiliary raw materials. Among them, main raw materials refer to those directly used in the production process for the physical product. The main materials include, for example, metal materials (steel, aluminum, copper, etc.), chemical raw materials (plastics, synthetic fibers, rubber, etc.), and natural materials (wood, etc.). Auxiliary raw materials refer to those that do not directly constitute the composition of food products, such as cotton, ores, electronic materials (silicon wafers, rare earth metals), and food ingredients (wheat, soybeans). The physical product, but materials that support, assist, or guarantee the production process, such as process aids (catalysts, welding gases, etc.), equipment... Prepare maintenance materials (lubricating oil, coolant, etc.), cleaning and protective materials (industrial alcohol, PPE, etc.), and packaging materials (pallets, cushioning materials). etc.

7.1.2.2 Calculation Method The comprehensive utilization rate of resources is calculated according to formula (4).

7.1.3 Development Cycle

7.1.3.1 Indicator Description In this document, the product development cycle is calculated for main products that account for one-third or more of the total output value. The product development cycle refers to the period from initial planning to completion of a product development cycle. The process from concept design to mass production and delivery typically includes three stages. product development, product prototyping, and mass production preparation. The development stage refers to the stage of developing and designing the product's structure, performance, and appearance; the product prototyping stage refers to the production of the product's prototype/sample. The performance testing and optimization phase; the mass production preparation phase refers to the process design, equipment development, and resource preparation for mass production/fabrication of the product. The stage. A product development project typically involves developing a basic model and multiple derivative models, and then achieving mass production. The development cycle can be calculated based on the average development cycle of the basic model products developed and mass-produced within the same product development project. (Statistical period not specified.) The basic model can be followed by derivative models. Product development cycle can be measured by the rate of change of the product development cycle, which refers to the rate of change of the product development cycle at each stage of the product development process. The current development cycle, achieved by using intelligent methods or tools such as digital design, simulation, or virtual debugging, is compared to the previous development cycle. Rate of change.