

Summary

The issue of the Make-to-availability model for repetitive types of manufacturing, discussed in the doctoral dissertation, is a response to the identified research gap. The analysis of literature, research papers and the author's experience, gathered during professional work in the manufacturing company, led to the formulation of a research problem in the form of the need to check whether it is possible to adapt the Make-to-stock model to efficiently and quickly respond to customer needs. The answer to this is the Make-to-availability model, which enables effective and efficient response to customer demand, thanks to the usage of rules, parameters and norms that are different from the previous models presented in the literature.

Over the last several years, many inventory management models have been developed for manufacturing companies (especially inventory management models for finished products), but none of them comprehensively meets the criteria of effective and efficient operation in the area of production planning and control as part of production management. In addition, the review of inventory management models showed that they are aimed at minimizing the costs associated with inventory, but they do not use the criterion of high availability of finished products, which is important today. The results of a comparative analysis of types, forms, varieties and production environments allowed to identify the varieties of production organization possible for the use of Make-to-availability (MTA), and for inventory management models it allowed to identify key elements of the model structure for development of MTA for repetitive types of manufacturing.

The main purpose of the doctoral dissertation was to develop the Make-to-availability model for the of repetitive types of manufacturing. The proposed model is built of the following elements: assumptions, parameters and norms, operating principles, operating conditions, performance evaluation criteria, methods and tools cooperating with the model. The developed structure defines the detailed operation of the models along with an identification of the effects at each stage. The identified instrumentation of methods and concepts cooperating with the model enables implementation in a manufacturing company in order to obtain effective and efficient in the scope of satisfying customer needs at the highest level of product availability.

The proprietary model was verified with the use of 34 simulation experiments and a case study method on a purposeful research sample in a global manufacturing company from the industrial automation industry. The size of the sample was determined by the possibilities of obtaining data from the enterprise to which the author had obtained access. An important advantage of the work is the verification of the model on real data, not on test data.

The conducted thorough analysis of the current state of knowledge in the field of stock management of finished products, the developed proprietary production model for availability and its positive verification for the stream forms of production organization confirm the author's contribution to the discipline of management and quality science, in the sub-disciplines: production management, services and technology, logistics management, support for managerial decisions.

Keywords

inventory management of finished products, production environment, make-to-stock, make-to-availability, manufacturing organization form, repetitive production, process approach in production management, manufacturing companies, product availability indicator, inventory costs, inventory buffer management