A method for the structur, dimension and material requirements of manufacturing systems

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The growing pressure of competition forces companies to produce cost optimal and to adapt immediately to changes in their environmental conditions. These decisions must always consider the integration of the companies in globalized markets on the demand side and on the supply side. This dissertation deals with the question how structure and dimension of production facilities can be planned optimally in this situation. Additionally the methods used for material requirements planning are selected and configured according to these decisions. The considered problems are represented in the form of four hierarchically ordered partial models, each of them realized by a mathematical optimization model. Since the problems hold dependencies from each other, coordination processes are developed for the use of the models in operation. Performance figures are used to differentiate between the normal top-down execution of the partial models and the escalation, i.e. planning of a superordinate partial model after a subordinate. The developed method is evaluated using a practical use case.