The idea of a Manufacturing Execution System originated in the 1980s and since then it is constantly evolving.

Nowadays the functionality of a MES is described by the combination of three functional scopes. Those areas have to work hand in hand to create a high performance MES and enable a well-timed and effective manufacturing control.

* Production:
  + Production data acquisition: record order an person related times and quantities
  + Machine data acquisition: manage machines and other resources
  + Operation data acquisition: collect order and personnel timing and amounts
  + Tool and resource management: manage tools and other auxiliary materials
  + Material and production logistics: supply information about material that is currently in circulation
  + Energy management
* For human resources: time recording, time management, personnel resourcing planning, wage calculation etc.
* For quality assurance: production inspection, complaints management, testing, measurement data acquisition etc.

As defined by the VDI (Verein Deutsche Ingenieure) in the norm VDI 5600 the tasks of a MES are the following:

* Detailed planning and detailed scheduling control
* Operating resources management
* Material management
* Personnel management
* Data acquisition and processing
* Interface management
* Performance analysis
* Quality management
* Information management
* Order management
* Energy management

Grafik ERP-MES-Shopfloor und Zeit

As shown in the figure the MES is located in between the ERP (enterprise resource planning) and the shopfloor level . Furthermore the time horizons of the different stages get significantly shorter from top to bottom. As in the ERP long- or mid-term decisions are made, the interested time period varies from months to days, whereas for the MES single days to minutes matter. For the shopfloor level it even depends on seconds.

Since the MES has interfaces with lots of other systems, it acts like a hub for the data. The ERP provides the base-data such as orders, quality requirements and capacity planning that needs to be saved and processed in the MES. But the MES also has to receive data from the production on shopfloor level including sensor values, process data, machine status, counter ticks or measurements that get processed to business relevant units. It is also possible that the MES provides specific data for the production for instance process value specifications, target values or recipes. When it is not possible to access these data automatically, workers have to insert them manually. When the MES is seen as a hub, it is important that it is integrated horizontally as well as vertically, which means that the information is distributed on the MES level and also throughout the different levels of the pyramid.

When using a MES a database, either an external one or the MES itself, with high requirements is needed. Data has to be consistent, plausible and complete, which is also relevant for data acquisition. Furthermore the database has to meet various security aspects so that the production is not endangered in case of power outage and other problems.