Chapter 2
Value Stream Analysis

The most popular field in German engineering is the in-depth optimization of individual production processes with a view to quality, reliability and output – vital factors of sustainable corporate success, as this is where specific technological know-how is generated and developed. However, being among the leaders – or indeed in the vanguard – of technological core competencies is not always enough to defy competition; the joint correlation of the different optimized processes is an equally important success factor. Accordingly, companies need not only technical skills but also workflow management competencies. Improvements achieved in individual production processes may easily go up in smoke unless planned and implemented with reference to the entire production process. Only when all production procedures are finely coordinated and appropriately linked logistically can a company be truly successful. The value stream perspective therefore concentrates on this superordinate aspect of correlation between the various individual production processes, thus moving the focus of attention towards certain crucial success factors in production, which otherwise might be overlooked.

Since a purely technological viewpoint only allows for highly selective inspection of a production, i.e. of individual production procedures, the examination of a production on the whole requires a more production procedure-related approach. The analytical findings of the former will achieve merely isolated improvements; only a holistic approach will enable an improvement of the entire production procedure. The latter, though, is the decisive factor for success, as isolated top performances will hardly improve a mediocre overall performance. On the contrary, the perspective has to be inverted. Based on the overall procedure of production the requirements for individual processes must be developed. This is very convincingly enabled by the value stream method.

Target-oriented current state mapping is an indispensable prerequisite for production improvement. Many analysis methods aim to collect data as exhaustively as possible. Unfortunately, however, these approaches are generally rather laborious with results of a seemingly higher precision than their actual informative value really lives up to. Besides, rather than giving a well-arranged overview of the overall production, they merely produce individual results condensed into graphs.

Another method for the correct current state mapping of a production is to depict all production procedures as comprehensively as possible. This, however, requires a systematic simplification of the recording process, summarizing differentiated data analyses in estimated empirical and/or mean values, thus considerably decreasing the relevant analytical effort and at the same time improving both
clarity and informative value of the respective results. In addition, analytical findings are available much faster thanks to the reduced effort – it will take only days to complete analyses that would normally have taken weeks. With all these qualities, the value stream analysis is a truly outstanding analytical tool, the application of which is described in detail in this chapter.

The value stream analysis is the perfect method for clear and comprehensive current state mapping. This is mainly enabled by taking into consideration production processes as well as material and information flows, but also by visualization with the aid of simple symbols. The book at hand expands the renowned method of graphic symbols (Rother 1999), in particular with respect to the information flow, and supplements the same with easy methods of data analysis. This considerably increases the application range as well as the informative value without any significant increase in effort or difficulty.

**Value Stream Depiction**

In order to be able to map the various productive activities of a factory as comprehensively as possible, a suitable modelling is necessary. A suitable model is a model that depicts an item in a simplified and functional way. This is exactly what the value stream method accomplishes in a highly effective manner. The modelling of a factory’s value stream is based on six basic elements, which may each be described by specific parameters and further differentiated by type (Fig. 2.1):

1. ‘Production Process’ stands for directly productive activities within the factory as well as external processing activities,
2. ‘Business Process’ describes order processing tasks incl. production planning and production control,
3. ‘Material Flow’ is the movement of materials between production processes incl. materials on hand,
4. ‘Information Flow’ stands for the transmission of data and documents between individual business processes and towards production processes incl. data frequencies,
5. The ‘Customer’ reflects the customer demand to be met by the production, thus modelling the system load.
6. The ‘Supplier’ represents the production’s supply with raw materials and parts.

The value stream flows from the suppliers through the factory to the customers, i.e. from the left to the right in the illustration below (cf. Fig. 2.1). Accordingly, downstream production processes are closer to the customer than upstream ones. The order processing-related business processes, the actual material flow in the factory and the entire information flow to all production processes together form the complete production logistics of a factory. The logistic linkage between two production processes reflects the material flow between both processes and their respective control logic. On a superordinate level we can therefore differentiate between production and logistics.