

## 22.03.2021 | IS OR SHOULD - THAT IS THE QUESTION HERE

How can an assembly line be timed so that output is as high as possible and worker stress and cycle balancing are as low as possible? To answer this question, the work planner uses methods of time determination. These include time recording (according to REFA) and time determination with MTM (Methods-Time Measurement). Prof. Dr. Peter Kuhlmann, CEO of the MTM ASSOCIATION e. V. and head of the MTM Institute, explains the differences between the two methods.

### Prof. Dr. Peter Kuhlmann on the comparison of REFA and MTM methods

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### ***Time recording (according to REFA) and time determination with MTM - is that a comparison between apples and oranges?***

"In a way, yes. Time recording (according to REFA) belongs to the methods that evaluate an ACTUAL situation in terms of time. That is, time recording requires an existing work system with trained employees in order to be able to observe and stop the work processes at the required frequency. Time recording with MTM, on the other hand, is a method that focuses on the TARGET situation. That is, workflows can be evaluated in terms of time using existing MTM process building blocks before the work system even exists. This means that all workflows and processes can be defined in terms of time already in the planning phase of a work system. It is also possible to assess the ease of assembly of products in advance."

### ***What other differences are there? Keyword performance level assessment ...***

"As part of the time recording, an assessment of the employee's performance level must be carried out. This individual performance level assessment is based on the subjective idea of a normal performance of 100 %. The parties involved are the person conducting the time study and representatives of the employee's side; representatives of the employer's side should be involved. The MTM process language or MTM process building bloc systems provide an internationally valid performance norm for human work that is independent of individual performance level assessments. The MTM standard performance of 100 % corresponds to the continuous performance of a moderately skilled person who can perform this level of performance over time without increasing work fatigue. Labor scientists also refer to the MTM standard performance as the primal meter of human (work) performance."

### ***Experts also refer to the MTM standard power as the primal meter of human (work) performance. Could you please explain this in more detail?***

"At the beginning of the 1940s, the American ergonomists Herold Bright Maynard, John Leonhard Schwab and Gustave James Stegemerten summarized the entire inventory of movement elements that make up manual activities, which had been decoded by Frank Bunker Gilbreth - American contractor and intellectual father of the MTM method - into basic movements. For each of these basic movements, a scientifically validated and standardized time value was determined and compiled into the MTM-1 data card, which is still valid today."

### ***What does "scientifically validated" mean?***

"To determine the time values, women and men of different ages in various industries were filmed performing manual tasks. Thanks to the large number of sequences and data, a stable, standardized norm performance was created in conjunction with a leveling procedure - and with the MTM-1 norm time value map, virtually the occupational science counterpart to the primal meter. The statistical validation of the MTM process modules and the associated MTM standard performance is documented in research reports from 1950-1952 and substantiated by the aforementioned film recordings."

### ***The MTM method originated in the USA in the 1940s-how does the transformation into the age of Industry 4.0 succeed?***

"The challenge is to digitize the planning of human work. The MTM process building blocks are the prerequisite for linking the digital planning world with the real working world through their standard performance reference. MTM standardizes the digital planning and simulation systems. With the development of the process building block system MTM-HWD® (Human Work Design), we have created the prerequisite for converting digital motion data (e.g. from human simulation, motion capture or VR/AR systems) into reliable, comprehensible and human-oriented time and ergonomics data in our work systems."

**If you have any questions, please contact Prof. Dr. Peter Kuhlmann, e-mail: [peter.kuhlmann@mtm.org](mailto:peter.kuhlmann@mtm.org)**

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