COST REDUCTION

WITHOUT SECRETS

MCPD & MDC: a success story

Dr. Alin POSTEUCĂ & Dr. Shigeyasu SAKAMOTO

by

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Content:

Note 1: Dr. Alin Posteuca is the author of Manufacturing Cost Policy Deployment (MCPD)
Note 2: Dr. Shigeyasu Sakamoto is the author of Methods Design Concept (MDC)

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Management Consultants

Productivity for Target Profitability

A) CURRENT CONDITIONS

THE COMPANY'S INTERNAL VOICES

Voice of Headquarter

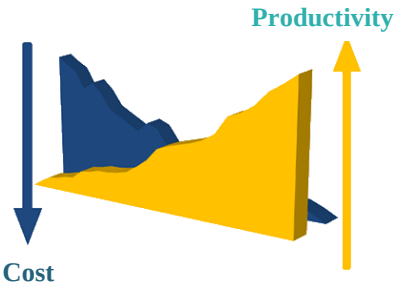
At AA Company, the volume and number of orders fluctuate widely and are often unpredictable. In order to cover the fluctuation of the orders received, in some periods the working time and the work during the holidays (overtime) were increased, and in other periods the production capacities were much surplus. At the same time, the level of unit costs has risen far beyond expectations and continues to have an increasing trend. In response, the CEO called for planned production to be completed during normal business hours to reduce overtime costs and further, he called for all ways to reduce costs without investment and without affecting quality and deliveries, in order to meet the annual and multi-annual Return on Investment (ROI) target and the profitability target.

About ”AA Company”: (1) type of industry: manufacturing and assembly; (2) production regime: repeated batch of equipment (equipment, transfer lines, semi-automated assembly lines) and manual activity (processing, inspection, assembly, etc.), (3) number of employees: 850.

Voice of Company

For countermeasures, the top management from ”AA Company” considers the introduction of **Manufacturing Cost Policy Deployment (MCPD)** and **Method Design Concept (MDC)** to generate the expected profit by eliminating and preventing constraints and losses that prevent the continuous reduction of production costs, more precisely to:

1) continuously know the feasible potential for total cost reduction and for each cost center;
2) continuously increase production capacity without investment;
3) meet the target of annual and multiannual production volume;
4) carry out production during normal working hours;
5) obtain the reduction of target unit costs at annual and multiannual level;
6) reduce the cycle time of operations (equipment and manual labor), of set-up time and of transfer time;
7) improve the quality level;
8) continuously reduce WIP level and lead time;
9) know and continuously plan the most effective and efficient improvements possible;
10) meet the annual/ multiannual target profit regardless of the sales trend (increasing/ decreasing).



A) CURRENT CONDITIONS

THE COMPANY'S INTERNAL VOICES

Voice of Managars

The top managers commented on the current conditions in the company as follows:

Mr. Smith, Plant Manager

"The bottleneck process in our company is the “Z1” process (plastic injection molding equipment - Engel). To meet the customers' demand for production in small batches for different types of products and on time delivery, 27 similar equipment with two day and one night shifts are fully functional. Overtime and work during holidays are used to avoid delivery delays.

A shift has 8 hours (or 8 hours * 60 min. = 480 min.). There is a 30-minute lunch break, leaving 7.5 working hours. On average, about 10 minutes are used for meetings at the beginning and at the end of the program, short guards, cleaning, inspection and more. Therefore, the average time of a shift (actual loading time) is 440 min. (480 min. - 30 min. - 10 min.).

Taking into account that the standard cycle time per product unit, synchronized with the upstream process time of the equipment, is 0.6 min./part, the theoretical production is 733 units/ shift/ equipment (or 440 min./ 0.6 minutes). However, in reality, the average production is only 390 units/ shift/ equipment during the normal operating time.

That means just over half the amount of theoretical production. Even if it is impossible to produce the theoretically calculated quantity, the target production plan (no overtime or work during the holidays) could still be met if 550 units/ shift/ equipment were produced (this means about 75% of the amount of theoretical output). Taking into account the forecasts of customer demand for our products and the lifespan of plastic injection equipment, it would be good that the 550 units can be made in a maximum of 12 months. At the same time, the capacity of the assembly lines has significant variations and this is our next bottleneck - after the “Z1“ process. Moreover, our calculations require an annual cost reduction of at least 6% for the coming years to be truly competitive and to achieve annual profit plans. Only in this way can the Return on Investment (ROI) target be met. Therefore, I am considering the introduction of the MCPD and the MDC to meet these pressing needs. "

Mr. Cooper, Production Engineering Manager

"The maintenance of equipment and assembly lines is our responsibility. The emphasis is on preventive maintenance but, unfortunately, it is difficult to eliminate the sporadic breakdown. In our factory we have made a rule to record the time of line sporadic shutdowns and equipment falls that are longer than 10 minutes. If we look at the historical records, the sporadic falls of the "Z1" process are on average of 25 minutes/ equipment/ shift during normal working hours. In addition to sporadic falls, there are also equipment shutdowns for set-ups and adjustments. For details, please ask the Head of the Production Department and the Production Manager. Although the standard cycle time to produce a product is 0.6 minutes, as mentioned by the Plant Manager, the current cycle time measured for the "Z1" process is 0.7 minutes. This means that if the 440 minutes of loading time were used correctly, the production of 550 units of products/ shift/ equipment could be possible. Even if 70 minutes per shift were lost due to equipment breakdown or set-up and adjustments, the target of 550 product units could still be easily achieved. Following personal investigations on the "Z1" process regarding the causes for which the production does not reach the target level of 550 units of products/ shift/ equipment, we identified that the so-called minor equipment shutdowns are due to wrong operations, incomplete personnel or operating errors. The frequency of minor stops appears on average 14 times/ shift/ equipment, but we did not measure the average total time for a shift for the "Z1" process. Moreover, the cycle time related to the products has variations due to the non-observance by the operators of the current working method. The non-compliance with the working method is also found in the case of semi-automatic assembly lines."

Mr. Gibbs, Production Manager

"It can be said that the major problem for the "Z1" process is the long shutdown of the equipment to perform set-up and adjustment activities. To meet the production requirements in small batches for various types of products - each month, about 15 types of products are constantly made on the equipment discussed (process "Z1"). It is preferable for a single product type to be processed continuously, but this could cause a high level of work-in-progress (WIP) - especially since it is already high. However, in order to avoid such a situation, it is inevitable to increase the set-up frequency. So, we have committed to reduce the average set-up time to a few minutes, but unfortunately the current average set-up time during regular working hours is 35 minutes/ shift/ equipment for the 5 major types of set-up. Moreover, the set-up time has large fluctuations from one shift to another for the same type of set-up. Therefore, I believe that there is a need to redesign the working methods of the operators and technicians who perform the set-up activities in order to reduce the set-up time and its variations. Moreover, I believe that the standard operating procedure (SOP) needs to be restored in order to reduce the current standard cycle time, both for equipment and for manual work, especially for assembly lines. "

Mrs. Porter, Quality Manager

”It is the personal opinion of the Plant Manager that the equipment (process “Z1”) can produce at least 550 units of product/ shift/ equipment. Of course, the production of defective parts is excluded. Fortunately, the quality level of the products is constant. The rate of defective products is about 2%, with an average of 8 defective products being produced for every 398 units that are produced on shift/ equipment.”

Mrs. Palmers, Financial Manager

"I understand and respect the work done by all our colleagues involved in all improvement projects. As you know, I have done and will do everything necessary to ensure that all the money needed for improvement projects is always available on time. But, as we know, we have gaps between the target cost set annually and the level of cost reduction achieved, both at the level of products and at the level of departments. This gap tends to increase and significantly affect the level of annual and multiannual operational target profit. The value of improving costs at the operational level seems to be high, but this improvement is not so visible in business results and especially in financial results. Moreover, our cash flow has big problems sometimes, the level of stocks is still insufficiently controlled, our unit costs being higher by 8.5% due to a WIP of 55% of the total stocks, planned man × hour/ product is not respected, which requires overtime and often special orders force us to make expensive purchases. I estimate are that about 30% of the costs of our production processes can be improved. I will limit myself only to these pressing issues that we keep talking about in our budget meetings. Therefore, I believe that the improvement projects carried out should show visible results in terms of reducing product costs and profitability, in order to be truly credible and to ensure that all the necessary financial resources can be provided exactly when they are needed, even if these financial resources do not represent large sums of money. I would like to be able to continuously see the feasible cost reduction potential for each area of the company and the concrete action plans to reduce those costs to ensure all the resources needed for operational improvements in a timely manner."

PROJECT THEME

Generating annual and multiannual profit and meeting the Return on Investment (ROI) target by:

- continuous sizing of feasible cost reduction potential;
- increasing the production volume from 390 units to 550 units on bottleneck equipment ("Z1") in the next 12 months and improving the "A1" line;
- reducing unit costs by at least 6% per year;
- multiplying MCPD and MDC to other areas of the company – the other semi-automatic assembly lines.

BASIC PRELIMINARY ANALYSIS

1) analysis of the current production flow and managerial objectives;
2) analysis of how KPIs are measured and collected (including for losses & waste);
3) analysis of the current way of measuring productivity in the production area;
4) analysis of measuring productivity at managerial levels (from shop floor to top management and vice versa);
5) analysis of how much productivity improvement depends on top management for the next 5-10 years;
6) analysis of how much of the productivity improvement targets depends on top management for the next 1-5 years;
7) analysis of the current cost and budgetary system;
8) analysis of maintenance, quality and industrial engineering systems;
9) analysis of how to plan, carry out and the results of improvements;
10) preliminary study of potential cost reduction.

INTRODUCTION IN MCPD & MDC

1) Short report on the potential for cost reduction (based on previous analyzes);
2) Decision to join MCPD and MDC;
3) Establishing the MCPD/MDC team;
4) Benchmark discussions;
5) Consulting budget preparation;
6) Exegens contracting;
7) Establishing extensive project teams;
8) Master plan development;
9) MCPD & MDC training;
10) Detailed examination of the production system.

STUDY OF THE POTENTIAL FOR COST REDUCTION

Starting from the voice of the managers and from their own measurements, the following were found:

Annual cost reduction potential in transformation costs structures (€ 35,928,000):

- average cost of losses for a "Z1" process shift: € 11,643
  (1) cost of losses for operation variance: € 2,100 and
  (2) cost of losses for efficiency variance: € 9,543;
- average cost of losses for 24 hours (3 shifts of the "Z1" process): € 34,930€;
- average cost of losses for 30 days of the "Z1" process: € 1,047,900;
- cost of losses for 12 months of the "Z1" process: **€ 12,574,800** (or 35% of annual transformation costs; including cost of losses for human work).

Annual cost reduction potential in material & system costs structures (€ 89,820,000):

- cost of losses and waste related to Material & Utilities Efficiency: € 4,950,000 (Material Yeld; Auxiliary Consumables; Die, Jig and Tool; Obsolete Spare Parts; Energy & Other Utilities);
- cost of losses and waste related to Inventory Consumption Efficiency: € 7,100,000 (WIP from Set-up Waste; WIP from Transfer Waste; Near to Line Inventory Waste; Raw Material Inventory Waste; Components Inventory Waste; Packaging Inventory Waste; Finished Products Inventory Waste);
- cost of losses and waste related to System Consumption Efficiency and Effectiveness: € 3,143,000;
- cost of losses and waste for 12 months related to material & system costs: **€ 15,193,000** (or 16.9% of the total material & system costs).

Total cost of losses and waste identified for the last 12 months: € 12,574,800 + € 15,193,000 = **€ 37,767,800** (or **30%** of the total costs were identified and located to be reduced).

ESTABLISHING THE ANNUAL MACRO KAIZENSHIRO

- potential and feasible annual macro KAIZENshiro (possible cost reduction target): € 15,500,000 (out of a total of € 37,767,800);
- **macro KAIZENshiro planned for annual cost reduction: € 7,500,000** (to meet both the 6% cost reduction per year and the increase in production volume from 390 to 550 units/ shift/ equipment);
- accurate determination of areas for improvement to contribute to the fulfillment of the planned annual macro KAIZENshiro;
- establishing the resource plan needed to meet the planned annual macro KAIZENshiro (especially the participation of people in improvements was planned).

IMPROVEMENTS TO REDUCE COSTS

Improvements made by **MCPD** (kaizen) to achieve annual KAIZENshiro of **€ 7,500,000** (process "Z1" but also the semi-automatic assembly line "A1"):

1) reduction and standardization of scheduled downtime (reduction by 15%);
2) reduction/ elimination of breakdown for "Z1" (reduction by 18%);
3) scrap reduction for "Z1" (reduction by 35%);
4) reduction of auxiliary consumables (reduction by 24%);
5) reduction of energy consumption (reduction by 12%);
6) packaging inventory reduction (reduction by 47%);
7) reduction of internal distribution time (reduction by 32%).

Improvements made by **MDC** to achieve annual KAIZENshiro of € **7,500,000** ("Z1" & "A1"):

1) elimination of speed losses variance for "Z1" (0.1 min .; from 0.7 min. to 0.6 min.);
2) reduction of cycle time for "Z1" (from 0.6 min. to 0.5 min.) and for line "A1" (reduction of cycle time by 35% which had an impact on the reduction of labor costs of 21%);
3) reduction of set-up time for "Z1" (from an average set-up of 35 min./ shift/ equipment to one of 9.5 min./ shift/ equipment) and for the line "A1" (reduction of set-up time by 52%).

RESULTS AND PROJECT EXTENSION

- The successful development and implementation of the solutions identified by the 10 improvement projects above led to the full fulfillment of the macro KAIZENshiro of € 7,500,000, without investments, in the 12 months of the initial project. The "Z1" process was no longer considered a bottleneck. Instead, the "A1" semi-automatic assembly line became bottkeneck and was improved. MDC was applied to the "A1" line in order to increase production capacity through innovative redesign and implementation of new working methods with superior performance (a cycle time lower on average by 35%). The MDC activities started from the study of the potential improvement of the productivity of people and equipment/ lines (MDC feasibility audit) and from the establishment of the micro KAIZENshiro (respectively Basic Functions – BF and Auxiliary Functions from cycle time);
- It was decided to extend the project for the full implementation of the Manufacturing Cost Policy Deployment (MCPD) and Method Design Concept (MDC) systems for continuous measurement and improvement of productivity by reducing/ eliminating the cost of losses and waste;
- Through MCPD and MDC it was made possible to achieve all the objectives set by the company's voice.
- The planning of macro KAIZENshiro has been extended for the next 3 years to continuously support the need to meet target profitability and ROI by continuously reducing costs based on increased productivity.
- The project expanded to group level, including by implementing the profitable production planning system called Speed-Based Target Profit (SBTP) to continuously meet the TAKT PROFIT target.

DR. ALIN POSTEUCĂ

He is a consultant in productivity and profitability, CEO of Exegens®. Prior to this position, he held top management positions in manufacturing and services companies.
His areas of expertise include planning and implementing business policies, improving costs and increasing profitability by consistently improving productivity. He has been actively involved in various industrial consulting and training projects for more than 20 years, delivering training/ workshop programs in Productivity, Innovation, Business Transformation and Leadership for over 6,000 participants.

He received his Ph.D. in Industrial Engineering from the Polytechnic University of Bucharest, Romania. Also, he received his Ph.D. in Managerial Accounting from the University of Economic Studies of Bucharest, Romania. He was a PhD research fellow at Institute of Technology, Linköping University Sweden. He has an MBA Degree and a BA Degree in Accounting and Computer Science at University of Iasi, Romania. He is certified Public Accountant in Romania. At the same time he is Scientific Reviewer at the International Journal of Productivity and Performance Management (Emerald Publishing, UK) and at The Romanian Journal of Technical Sciences (Romanian Academy). He also has published in various research journals and presented papers at numerous conferences and congresses regarding Productivity, Profitability and Industrial Engineering. Dr. Alin Posteucă won the **Traian Vuia Prize of the Romanian Academy** – Department of Technical Sciences (for the year 2020). Dr. Alin Posteucă is the author of **Manufacturing Cost Policy Deployment (MCPD)** and **Speed-Based Target Profit (SBTP)** concepts, published in four books at Productivity Press – Routledge/ CRC, NY (USA).

DR. SHIGEYASU SAKAMOTO

He is a management consultant in productivity and profitability improvement and CEO of Productivity Partner Incorporation – Japan. Before his current appointment, Dr. Sakamoto was vice president of Maynard MEC AB (Sweden) and vice president of JMAC (Japan Management Association Consultants).
Dr. Sakamoto is a Fellow at the World Academy of Productivity Science. He received his doctorate degree of policy science from the Graduate School of Doshisha University in Japan and is certified as a P.E. by the Japanese government. He is also certified as: industrial engineer from the European Institute of Industrial Engineers, international MTM, method-time measurement instructor from International MTM Directorate (IMD), a MOST instructor from Maynard Management Institute and Work-Factor and Mento Factor instructor from WOFAC Corporation. He worked for the IMD as the technical coordinator responsible for developing a new system of MTM. He is a senior member of the Institute of Industrial Engineers in USA.
Dr. Sakamoto is the author of over 30 books (in Japan and 2 books in the USA/UK), over 100 articles (in Japan) and over 20 presentations at international congresses and conferences (worldwide).
Dr. Sakamoto has more than 50 years of management consultant experience and he has very good feedback from his clients – top management – especially regarding the direct contribution to corporate performance with his own developed methodology of **Method Design Concept (MDC)** and work measurement.
Dr. Sakamoto insists that the fundamentals for a higher level of Syakaku is only possible to reach through a higher level of profitability based on a higher level of productivity.

C) OUR VALUES: OUR CLIENTS

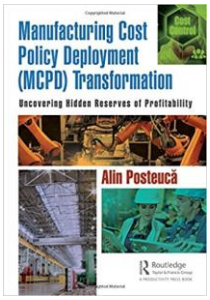
Your success is our success

Do you want to know **the potential for a feasible reduction of your company's costs** (equipment and / or assembly lines) for free and without us coming to your company? Then let's set up a phone or Skype / Zoom discussion to discuss in detail how we can help you find out how much your company's costs can be reduced without investment and how.

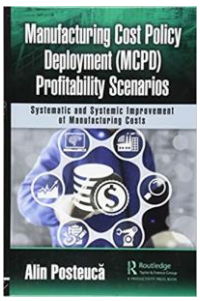
Best regards!
Alin Posteucă
Dr. Ing., Dr.Ec., MBA
CEO al Exegens®

Our books:

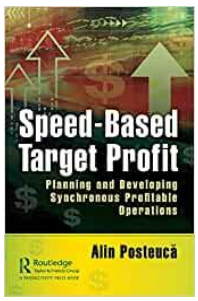
Understanding the MCPD & MDC - details ☞ **aici**



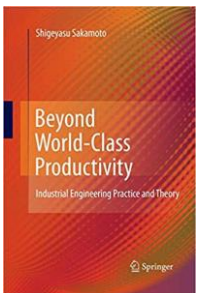
Transformation through MCPD - details ☞ **aici**



MCPD Scenarios: Kaizen & Kaikaku - details ☞ **aici**



TAKT PROFIT for Target Profit - details ☞ **aici**



MDC: The Best Productivity - details ☞ **aici**

M.R. Marcu, Street, 6th District, Bucharest, Romania; Mobile: + 40 744 350 499; +40 770 609 409
www.exegens.com; office@exegens.com