

Ensuring continuous improvement processes through standardization in the automotive company

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Abstract This chapter presents the concept of standardization. Presented research subject-central lamp, which is part of the car's external illumination. With BOST questionnaire - management principles Toyota's questions were analyzed E6 area associated with the six Toyota management principle.

Key words – standardization, automotive company, central lamp, BOST questionnaire

1. Introduction

In any modern company employees perform their work according to certain rules of operation. Often searched the best way to perform a task, and when it finds it "freezes" the naming standardization. Standardization is not only the best, most effective and safest method to perform a specific task. It also provides a basis for improvement tasks. Ford said that "today's standardization (...) is a necessary foundation on which tomorrow will be encouraged to improve. If you think of standardization as something that today is the best, but tomorrow will be corrected, you are on the right way. However, if you think of standards as something that limits the progress is stopped".

Effective management is based on maintaining and improving standards. The first task should be to maintain management standards based on the cycle of SDCA (standardize - do - check - act). When

standards are adhered to by employees, the next task should be to improve the standards based on the PDCA cycle (plan - do - check - act). Standards perfected through Kaizen activities. A typical recording format used to improve the standards of the QC Story. QC Story, also known as Kaizen story follows the PDCA cycle and helps in solving problems, based on an analysis of data. It is also helpful in reporting Kaizen activities that are carried out by the staff and management of the company.

2. Characteristics of research subject

A central lamp being one of elements of outside lighting cars is the subject of the research. Lamps include central and side illumination lamps, floodlights and indicators. Central lamps are in a car directly by side lamps and with them they create the system of the back illumination (right central lamp on the left of side

lamp and left central lamp on the right-hand side of side lamp).

The central lamp consists of many elements, the part from them originates from suppliers, the part is produced in the research enterprise. They include elements originating from suppliers: unleaded light bulb W16W, unleaded halogen bulb H21W, screw to the fastening self-tapping, gasket cut out, gasket laced up, stretching gasket, polypropylene tape, double-sided screw M6, double-sided screw M5X0, vertical special joint, joint P21W 0,5 mm, joint of the rims W16W, metal hairpin 12 mm, divider 1140x950x460, divider of polythene foam 400x300x1, cover, sealing pad 24 mm, spherical pad, distance pad 0,8 mm+/-1, threaded tile, M6, circuit board, ring fixing the light bulb W16W, aesthetic cover, circumference cut out, nut with the collar M6 closed off, nut M5 plastic – metal, grate T3W, bleeding cork, fixing stake, colourless foil LDPE 50x0,08, filter RN, thermosensitive label 20 mm, white label self-adhesive 35x40, heat-insulating screen, thermal screen of the lid, thermal screen of the corps, fixing lever, aluminum wire rolled up.

Elements produced in the research enterprise are: aesthetic frame, cover, positional reflected light, fog reflected light, corps, lampshade, fixing lever.

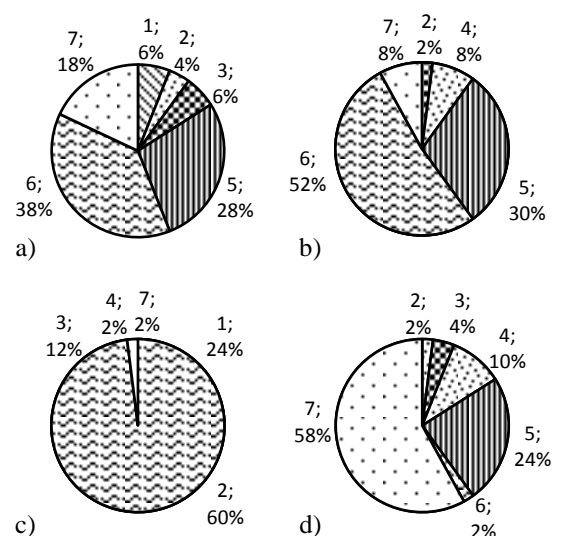
3. Description of achieved results

BOST questionnaire (BORKOWSKI S. 2012a, BORKOWSKI S. 2012b, BORKOWSKI S. 2013) was created by Prof. Stanisław Borkowski, director in the Institute for Production Engineering in the Faculty of Management in the Częstochowa University of Technology and is based on the principles of Toyota manufacturing system (BORKOWSKI S., INGALDI M., JAGUSIAK-KOCIK M. 2012, KRYNKE M., MIELCZAREK K. 2013). It can be used both in the production and service-providing companies. The questionnaire is dedicated to both managers and employees and the questions correspond to the Toyota's principles and the Toyota house roof. The BOST questionnaire also contains the evaluation of the managers according to the Toyota's principles and the respondent's profile and specification of the enterprise's/institution's activities.

The BOST questionnaire is comprised of 12 sets of factors. The version for the employees contains a set of

factors which determine the elements of the Toyota house roof and the principles 1, 2, 3, 4, 6, 7 and 14, whereas the version for the employers includes a set of factors that describe all the principles of management in Toyota and the elements of the Toyota house roof. The questionnaire contains a ranking of importance and the respondents evaluate the importance of each factor on a particular scale.

In the analysed company a BOST questionnaire form was conducted amongst 50 production workers which agreed anonymously to fill in a questionnaire. The detailed analysis concerned 1 set of factors. This set of factor was denoted as the area E6 (BORKOWSKI S., SELEJDAK J., 2011. BORKOWSKI S., SELEJDAK J., JAGUSIAK-KOCIK M. 2011., BORKOWSKI S., SYGUT P., BALIŃSKA M. 2011., BORKOWSKI S., ULEWICZ R., KONSTANCIAK M., KNOP K., STASIAK-BETLEJEWSKA R., KRYNKE M., JAGUSIAK-KOCIK M. 2012), relates to the principle 6 of Toyota's management ("Standardized tasks and processes are the foundation for continuous improvement and employee empowerment"). The respondents were asked to choose from the set of factors such as: the execution time of one task (CW), the process (PU), stores at the position (MP), documents (DO), trainings (SN), flow of information (PI), employment (ZA) and answer to the following question: Which type of standardization is the most important in ensuring continuous improvement of the processes in your enterprise (scale of 1 to 7)?



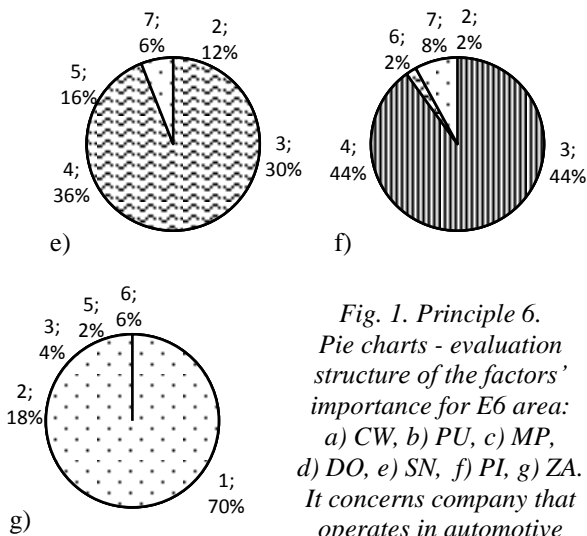


Fig. 1. Principle 6. Pie charts - evaluation structure of the factors' importance for E6 area: a) CW, b) PU, c) MP, d) DO, e) SN, f) PI, g) ZA. It concerns company that operates in automotive industry.

The most important factor (evaluation "7") to ensure continuous improvement of processes most, because 29 (58%) of the 50 patients assessed the standardization of documents (Fig. 1d). Included in these instructions work and any information related to the production processes determine their course. It is very important that all documents can be understood by every employee at every stage of production. This can be achieved just by their standardization. Standardization of processes (Fig. 1b) received "6" evaluations of the 26 patients (52%). To perform the manufacturing operations was smooth, it must proceed in the same way regardless of the person who is responsible for them. Each employee must work according to specific instructions, it allows to maintain the highest level of efficiency and prevents the occurrence of non-compliance in the process. The standardization process has also received the most, because 15 (30%) evaluations "5". Less, because 14 (28%) evaluations "5", but 38% of evaluations "6" received a standardized execution time of one task (Fig. 1a). With the standardization of the execution time of one task, you can develop an effective system of material flow. Providing individual items just in time requires knowledge of the time of their creation. For the system to operate effectively, the latter must always be the same. Another benefit of standardization of the execution time of one task is the ability to test the effectiveness of employees, it's time for the task by each of them can be referenced to a standardized time,

so that you can determine which employees carry out activities too slow and eliminate the cause of such a state. Standardization of information flow (Fig. 1f) received from 22 patients (44%) evaluation "4" and from 22 patients (44%) evaluation "3". This means that for almost every employee is a member or not of the essence, not the least important. The flow of information is essential for all processes, the standardization avoids misunderstandings due to wrong information read by the recipient, or incompetent transmission by the sender.

Standardization of training (Fig. 1e) were assessed by 18 employees (36%) to "4" and for 15 (30%) to "3". Standardization of training was rated less than the flow of information standardization, both of which are in the eyes, or the most important or least important in ensuring continuous improvement of processes. Training helps to ensure that every employee will perform all the steps in the same way. Training conducted by the company enable the implementation of the operations by employees, as the company wants. Standardization of stores at the position (Fig. 1c) was indicated by 30 respondents (60%) evaluated at "2". Such a low rating due to the fact that this element, compared with other is not so great significance for improving the process. Although it is an important factor in order to save time and space, which results from the standardization, but more improvement can be achieved by standardizing rated higher than the storage elements przystanowiskowe. The lowest rated was standardization of employment (Fig. 1g), as many as 35 of the 50 respondents (70%) awarded the evaluation "1". This is due to the fact that this element does not directly affect ensure continuous improvement of processes, mode of employment, although important, it does not exclude the possibility of achieving high performance by them, which is impossible to achieve with a good level of training.

4. Conclusions

Through the use the BOST questionnaire in the research company can say that standardization plays an important role in ensuring the continuous improvement of processes and quality. The survey BOST is clear that the employees as the most important for the company indicates the standardization of documents,

processes and execution time of one task. Surveyed employees by completing a survey indicated that clear, transparent documents on each workstation and a detailed description of the processes are the foundation of business process improvement

References

1. BORKOWSKI S. 2012a. Toyotaryzm. Wyniki badań BOST. Publisher PTM. Warszawa.
2. BORKOWSKI S. 2012b. Zasady zarządzania Toyoty w pytaniach. Wyniki badań BOST. Publisher PTM. Warszawa.
3. BORKOWSKI S. 2013. Toyotarity. Term, model, range. Production Engineering Archives. No. 1. ISSN 2353-5156.
4. BORKOWSKI S., INGALDI M., JAGUSIAK-KOČIK M. 2012. Standardization of Galvanizing Processes as a Basis of Coating Quality. Chapter 2. In: Toyotarity. Quality of Services Assessment According to BOST Method. BORKOWSKI S., INGALDI M. (ed.). Faculty of Logistics, University of Maribor. Celje.
5. BORKOWSKI S., SELEJDAK J. 2011. Toyotarity. Types of standardizations. Publish.Yurii V. Makovetsky. Dnipropetrovsk.
6. BORKOWSKI S., SELEJDAK J., JAGUSIAK-KOČIK M. 2011. Factors of the standardization at the production of PVC tubes. Chapter 2. In: Toyotarity. Types of standardizations. BORKOWSKI S., SELEJDAK J. (ed.). Publish.Yurii V. Makovetsky. Dnipropetrovsk.
7. BORKOWSKI S., SYGUT P., BALIŃSKA M. 2011. Standardization as Factor Supporting Components Production Technology for Bathrooms. Chapter 5. In: Toyotarity. Types of standardizations. BORKOWSKI S., SELEJDAK J. (ed.). Publish.Yurii V. Makovetsky. Dnipropetrovsk.
8. BORKOWSKI S., ULEWICZ R., KONSTANCIAK M., KNOP K., STASIAK-BETLEJEWSKA R., KRYNKE M., JAGUSIAK-KOČIK M. 2012. Standardization Process in Production of Glass Bauble. Chapter 9. In: Production Management - Contemporary Approaches - Selected Aspects. Monograph. Hadaś Ł (ed.). Publishing House of Poznan University of Technology.
9. KRYNKE M., MIELCZAREK K. 2013. An evaluation of realization of the production process in the cement mill. Production Engineering Archives. No. 1. ISSN 2353-5156.