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#### QUALITY METHODS IN QUALITY MANAGEMENT SYSTEM - EVALUATION OF RELEVANCE

Many companies pursue the status of a qualified OE/OES supplier. The status of a qualified supplier makes it possible for companies to gain new OEM clients. In this case, quality management plays a very significant role. It, in turn, is based on several groups of requirements which vary as far as their level of detail and difficulty in implementing them are concerned.

The results of the research carried out by the author indicate the relevance and the role of methods and techniques used as a part of quality management systems in the automotive industry. The use of such methods and techniques stems from the requirements of the ISO/ TS 16949 standard, which is the basis of supplier quality management system, as well as from customer specific requirements and the culture (maturity) of the organisation. It is beyond any doubt that suppliers in the automotive industry have to develop quality management systems and as a part of this process they need to improve the effectiveness of quality management methods and techniques which are used by them.

The research problem, as defined by the author, regards the relevance of particular quality management methods and techniques.

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Assumptions, objectives and hypotheses of performed research. In this paper a research problem regarding the evaluation of relevance of quality management methods and techniques in management systems of suppliers in the automotive industry has been defined.

It has been possible to account for the research problem by defining and realising the objective of the work, which has been limited to defining the methods and techniques in the automotive industry which are used in relation to OE/OES supplies and evaluating the relevance of each one of them as far as the effectiveness of QMS is concerned.

The following tasks have been performed as part of the realisation of the research objectives:

- presenting the key methods and techniques for quality management used in the industry,
- evaluating the relevance of requirements on a sample of companies, which undergo comprehensive assessment, both from the point of view of certifying bodies and clients; these companies realise their own priorities which are aimed at the effectiveness and efficiency of management systems and business efficiency,
- drawing conclusions, in the form of recommendations for suppliers and potential suppliers for the automotive industry as well as in the broader perspective for all organisations pursuing the improvement of their QMS.

In order to realise the project the following research hypothesis had to be verified: the key methods and techniques of quality management used by the suppliers in the automotive branch result from customer requirements related to quality management system. These are the PFMEA, flow diagram and 8D [2].

The results of the research together with the conclusions drawn from it will make it possible to define efficient strategies for the development and improvement of QMSs - both for present and potential suppliers (1st and 2nd tier) for car manufacturers (OEM). Due to the fact that the methods and techniques used in the group of analysed companies are very universal, the results of the research will also be universal for all companies which realise the TQM strategy.

Research methodology. Within the project the following tasks were performed:

- comprehensive query of literature: performed at the planning stage; its results were used to make the objectives and scientific hypotheses more specific as well to prepare research and to draw conclusions based on its results
- preliminary research (R1) was realised in cooperation with a group of experts, in which the author is the moderator (research method: the Delphi method, in-depth interview; tool: updated list of quality management methods and techniques; data collection method: the Internet, meetings, telephone conferences, video conferences)
- proper research (R2) was carried out on the whole population (all companies which certified against ISO/TS 16949) (research method: structured questionnaire interview; tool: questionnaire; data collection method: the Internet)
- data analysis - study an statistical inference.

Customer specific requirements related to the use of methods and techniques in quality management. Customer specific requirements (CSR) are extensive, formal sets of requirements related to quality management, most often based on the fundamental requirements for QMS (e.g. ISO/TS 16949), which also include the requirements related to the need of using quality management methods and techniques. Not seldom, CSR are lists of requirements specific to a given company, which do not reflect the scope of requirements or even the content of technical specifications.

All car manufactures, as well as significant suppliers have their own CSRs. It can also be said that certificates which are held by the suppliers reflect the formal requirements which the suppliers are required to meet. However, the most important thing is to prove that a QMS meets customer specific requirements as far as quality management is concerned.

Identifying these requirements is a key element of the APQP/PPAP process and any departures have to be approved by the client in writing.

Although it may be possible to indicate a number of most significant requirements which are included in CSRs, the list is not exhaustive. The more so because the level of detail of specific requirements varies significantly among different OEMs.

The most important requirements which are frequently found in CSRs are: Advanced Product Quality Planning (APQP), Production Part Approval Process (PPAP), TPM, flow diagrams, 5S, audits of management systems for quality, product and processes, contingency plans and business continuity plans, layouts, communication with the customer, problem solving methods, risk assessment - FMEA, control plans, measurement system analysis (MSA), statistical process control (SPC), special characteristics and indicator assessment for suppliers.

Many of these requirements include or directly concern the use of quality management methods and techniques.

Conclusions. The source of knowledge about diverse methods and techniques of quality management are above all textbooks and manuals which provide a broad spectrum of information. Guides, interpretations of standards and concern materials are also a very important source of information. Unfortunately, as experience shows, these tools are not always known and even if they are known they are used more to document the results of some intuitive actions and not to achieve the aims they should serve. Literature in this field presents a significant number of methods and techniques of quality management. At the same time, when the market is analysed it can be noted that only a few of them are used. The results of the performed research indicated that the most significant are methods and techniques related to Advanced Product Quality Planning (APQP) and Production Part Approval Process (PPAP) – flow diagram, PFMEA, as well as the 8D problem solving worksheet. The conclusions only confirm that the most significant role in shaping quality management system is played by customer requirements. These methods are vital when implementing new products and managing complaints [3].

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