

**QUESTIONNAIRE RESEARCH COMPLEXES OF PERCEIVED QUALITY OF AUTOMOBILES IN RUSSIA****Vladimir Kozlovskiy*, Dmitry Panyukov, Veronica Odruzova**

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ABSTRACT

The development of analytical quality management tools in Russia at present is closely connected with more intensive study of customer satisfaction problems. The conventional auto quality assessment systems based mostly on reliability measurements during operating period are now considered by automotive manufacturers as just one of the segments in the general product quality assessment. Active implementation of marketing tools into the quality management processes is under way. A very important quality measurement tool here is the questionnaire complex of assessing customer satisfaction with product quality during operating period. The development and implementation of questionnaire complexes should be based on substantial modification of manufacturer's analytical processes. Only an aggregate product quality assessment from the point of view of reliability and contentment may ensure adequacy in assessing current market demands. The present research provides for the process of solving basic tasks the automotive manufacturers are facing in implementing an up-to-date analytical quality assessment system.

INTRODUCTION

In many areas of activity the automotive industry is an indisputable leader in implementing innovative technologies and management tools. The success of automotive leading companies induced the manufacturers in other spheres to introduce quality management tools and, in particular, the analytical tools of monitoring and predicting product and services quality. Impartially big automotive manufacturers are engaged in generating and developing their corporate requirement systems exerting key influence upon auto component manufacturers and auto service companies. They set a very high level of standards in the field of quality management and generate the tools representing new approaches in raising the efficiency of processes management.

In our view, one of the most important things in the development of quality management tools at the moment is the analytical sector of monitoring and prediction. Owing to information technologies and interfunctional approach at the expert level, here begins the formation of tools for measuring perceptible product and services quality on the basis of questionnaire complex research that provide for methodology of organization's strategic planning within the scope of complex quality assessment processes.

As noted by several researchers (Yang, 2011; Tanninen, Puumalainen & Sandström, 2010; Ferreira, Cabral & Saraiva, 2010), in recent decades the activities of companies involved in measurement of customer satisfaction with quality of products and services became essential in the system of corporate business processes. In actual truth the elaboration of competitive market in all sectors of economy provides for development of customer satisfaction measurement methods. Russia is no exception here. The present-day automotive industry in Russia should be considered as a pool of traditional automotive manufacturers, industrial auto assembly joint ventures, and multinational corporations implementing turnaround automobile production cycles. The competition here is permanently growing, and the fight for customer loyalty becomes tough.



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The perceptible product quality should be regarded as the quality assessment perceived by the customers. This assessment is currently considered most topical. It is implemented as quite a system of corporate standards to define the approach to quality measurements at every stage of auto lifecycle.

The current article demonstrates the results of research and development of questionnaire complex sets functioning as consumer satisfaction assessment with respect to car quality during its lifecycle operating period.

The measurement of perceptible product quality assessment was introduced by world leading companies in the 1970s, as for the Russian manufacturers, this process started in the beginning of 2000s. The basic problem here is the fact that for a long time the Russian automotive industry was growing and developing on its own, without any practical consideration of world experience, including the sphere of customer satisfaction assessment tools and methods. With arrival of multinational automotive corporations and the requirement to implement ISO/TS 16949 at production enterprises it became indispensable to adjust Russian approaches to the world experience in this field.

The analysis of this experience allows to conclude that the approach to customer satisfaction assessment was widely discussed in 1990s and 2000s. For instance, in the Article Kristensen, Kanji & Dahlgaard (1992) the dependence of company profits on the total customer satisfaction was considered and the system of customer satisfaction measurement was proposed. This research continued in the series of articles Eklof & Westlund (1998) and Eklof, Hackl & Westlund (13) (1999). At that time in Russia this approach was underdeveloped since the market relations in the country was only beginning to form.

An important phase in implementation of forecasting methods of customer satisfaction assessment for future periods was introduction of National Customer Satisfaction Index (NCSIs), i.e. specific aspects differing customers in different countries. European ECSI and American ACSI were considered by Kristensen, Martensen, & Gronholdt (2000) and Anderson & Fornell (2000) from the point of view of their methodology. The same year the article Bruhn & Grund (2000) about the Swiss Index (SWICS) was published. The article Grigoroudis, Nikolopoulou & Zopounidis (2008) continued and summarized these approaches. In Russia similar researches began later, but being a very important direction its topicality cannot be underestimated. Our experience allows us to state that at the Russian automotive market the following ratings are standing out: reliability, possession price, maintainability, secondary market car price.

In the article "Customer satisfaction and customer loyalty as predictors of future business potential" (Eskildsen & Kristensen, 2008) the authors quite fairly note the possibilities of utilizing customer satisfaction data in the process of forecasting future business potential of the company. At the same time, in our opinion, in order to ensure the required level of forecasting results it is essential to provide a substantial scope of additional information, which, through implementation of correlation and regression functions allow to identify consistency of results at the initial stage, and then to implement an appropriate forecast. For the Russian automotive industry the additional scope of information should include computer data base on failures during guarantee and post-guarantee lifecycle periods.

The Authors of the Article "Customer satisfaction: How can I measure it?" (Kondo, 2001) noted that "Customer satisfaction is the final target of total quality management. At the same time, it should be noted that there are always plural criteria of its assessment". Considering a modern auto as an advanced high technology product the definition of satisfaction from the point of view of perceived quality consists in integrating multiple data influencing the customer satisfaction this or that way. With regard to Russia we should stress just the infallibility ratings as the key ones in defining customer satisfaction.

The traditionally high level of competition on the Western market, as well as the appropriate provision of automobile reliability at all stages of its lifecycle, predetermined substantial development of questionnaire research methods employed by world leading automotive manufacturers. Indeed the leading companies fairly believe that the integration of consumer satisfaction assessment and auto reliability ensure most comprehensive judgements of the current competitiveness level of the enterprise regarding the quality. Implementation of analytical quality measurement tools via a wide range of information sources creates prerequisites for more



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grounded product and service quality planning in both operational and strategic periods. A substantial argument to support the questionnaire complex research is the fact that in the process of permanent improvement of auto reliability ratio that we have been witnessing for the last 20 to 30 years, the manufacturers succeeded considerably in ensuring infallibility. As an example, Figure 1 shows diagrams representing product reliability improvement with one of the automotive industry leaders within the time span of 2003 to 2011. At the same time the consumer pays naturally more attention to the problems of functionality, comfort and emotional characteristics of the product. Traditional information sources of automotive manufacturers communicating via service companies' network are guided mostly by records of auto failures but even in that case certain problems of product reliability just escape consideration. First of all it has to do with the articles not listed as replaceable under the warranty, like bulbs or spark plugs.

More and more complaints refer to comfort for a consumer, but they do not bring him to service facilities

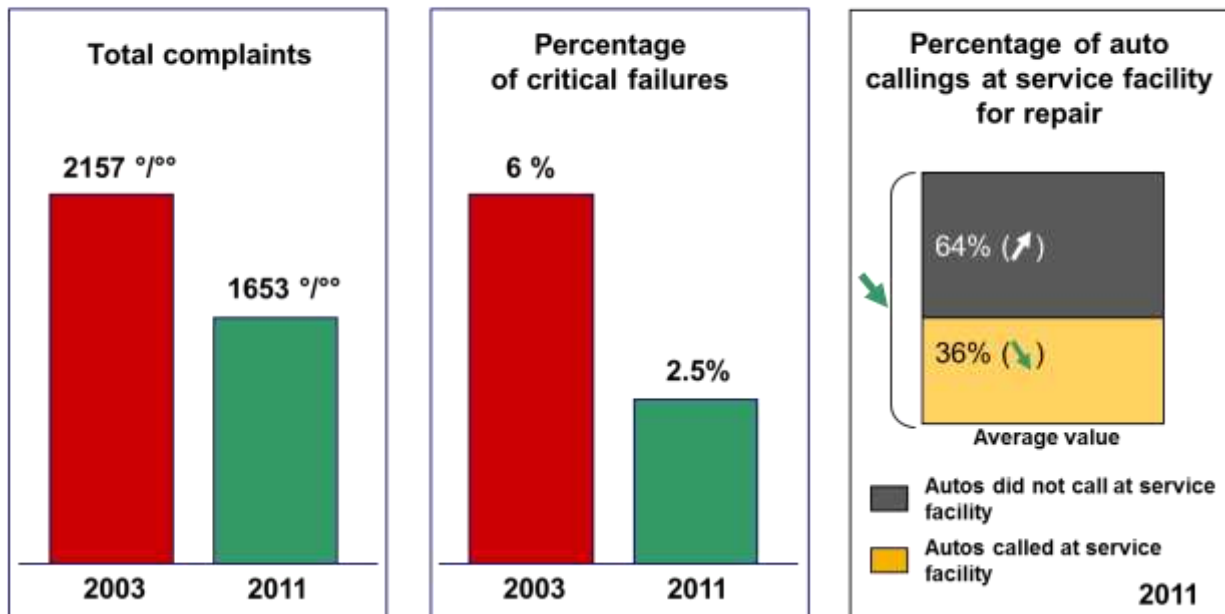


Figure 1. Tendencies in improving reliability of autos in use.

Hereby the problem is caused by insufficient data scope regarding the quality of automobiles in the process of operation received from traditional information sources. For all this the significance and efficiency of working with customers, taking into account heavy market competition, determines the competitive ability of automotive enterprises now and for the near future.

CASE STUDY

Nowadays the infallibility of Russian brand autos is lagging behind the world level. But this level is attainable. At the same time the methodological basis of questionnaire complex for traditional Russian brands either is not available, or its development is not so dynamic as in the West. Hence we face another important problem – the necessity of developing and implementing up-to-date complex of questionnaires consistent with the best world experience for Russian automotive manufacturers.

Considering per se the experience of conventional Russian manufacturers we can say that the range of their work in assessing perceptible product quality at the best is limited to conducting a relevant research once a year (Figure 2). In so doing the objective function of the research is quantitative score assessment of customer satisfaction with product and service quality. With a wide range of customer satisfaction measurement (Figure 2) the obvious



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shortcomings of the questionnaire complex are the poor qualitative area in the questionnaire base and the distance between score assessment and quantitative rating used in analytical monitoring of operating auto quality. The latter aspect substantially complicates the joint analysis of auto failure and customer satisfaction data. Look farther ahead, the impossibility of correlating information from different sources makes it impossible to work out the enterprise quality development strategy based on customer satisfaction, which has become nowadays a foundation of competitiveness planning for the market leaders.

Customer satisfaction research. Conventional approach

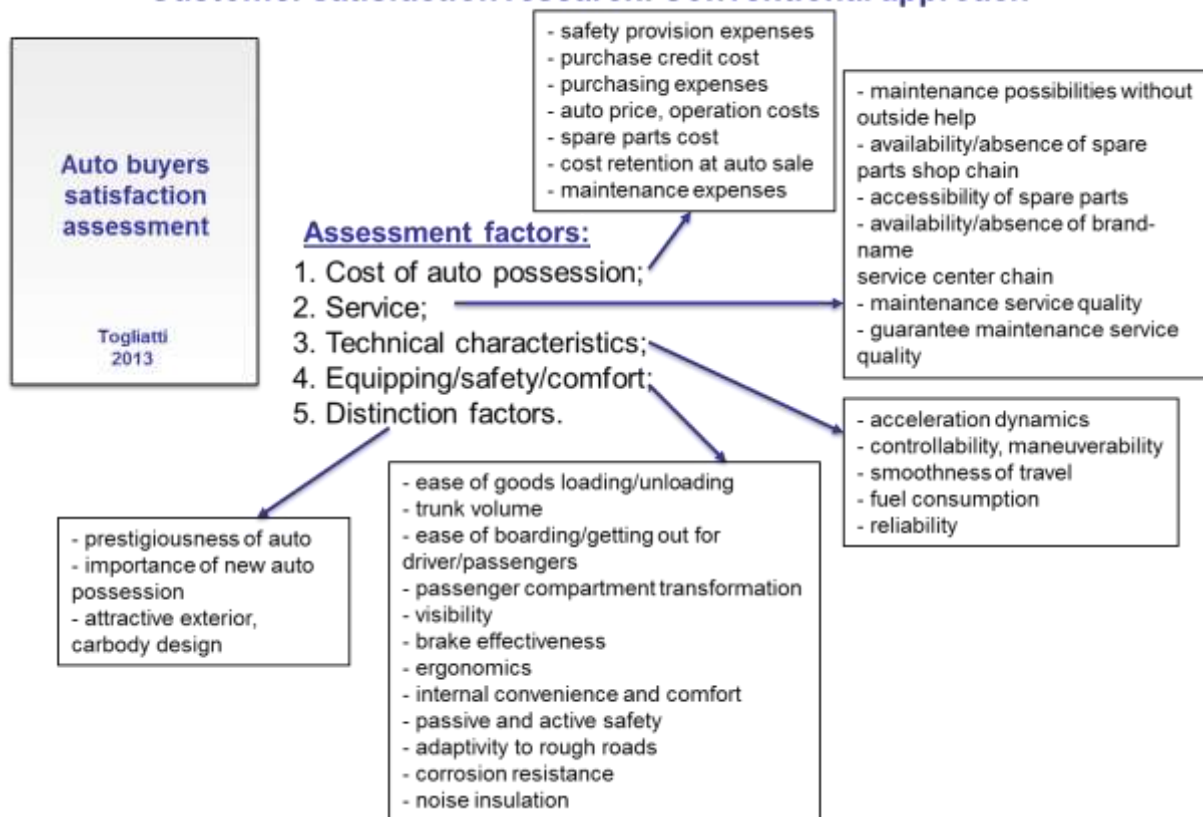


Figure 2. Traditional questionnaire complex for studying customer satisfaction

In the situation when the statistics of product failure during operation is the only dominating factor in quality planning for many Russian manufacturers, one should be cautious in discoursing upon effectiveness of the process of strategic competitiveness development as well as a full-fledged execution of one of the basic principles of quality management – the customer focus.

Implementation of researches of customer satisfaction with perceived quality of autos during operation, taking into account (Yu, Wu, Chiao & Tai, 2005), provides for the possibility to classify the research according to determined search functions. For instance, during the first three operation months the customers record mostly minor faults, and pay attention to functional problems. Later, in the process of operation the customer starts paying more attention to auto reliability. That is why the analysis of customer satisfaction with perceived quality of autos operating over 24 months should be considered in Russia to a greater extent from the reliability point.

The applied research in customer satisfaction assessment (Ray, 2006) ensure the solution of definite problems considerably influencing customer satisfaction with perceived quality of autos. System implementation of complex analysis of this kind provides for operational and strategic response to customer demands.



SOLUTION TO PROBLEM

In our opinion the solution of the highlighted problems lies in the necessity of organizing the system of joint reliability and perceptible auto quality within the framework of integrated questionnaire complexes based on integrated methodology and physically similar characteristics. In the process the customer satisfaction assessment results will no longer be considered by some organization top management representatives as something irrelevant to the problem of competitiveness. In order to prove the latter assertion we will show the diagram demonstrating the correlation between quantitative score assessment of customer satisfaction with perceptible quality and the amount of problems they faced in the first year of auto operation, based on the results of questionnaire complex research implementation (Figure 3).

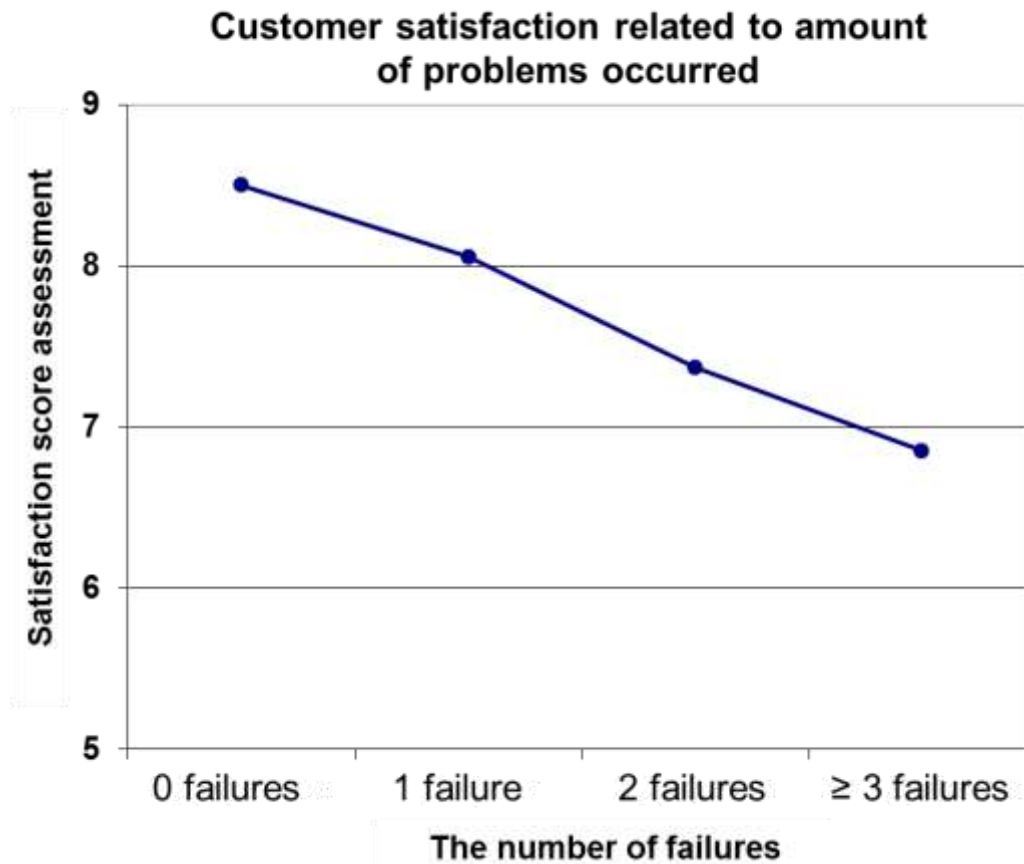


Figure 3. Diagram of customer satisfaction score assessment variation depending on the amount of problems occurred in the process of autos operation

The diagram of Figure shows the substantial decrease of satisfaction score assessment with the growth of failure amount. If the amount exceeds one, we can speak about assessment transfer from the loyalty zone (9 to 10 score points) to the indifference zone (7 to 8 score points). If the amount of problems exceeds two, the assessment moves to the dissatisfaction zone (0 to 6 score points). It is worth noting that for a consumer in some way it makes no difference whether his problem lead him to the service center to eliminate the defect or the problem is connected with inconvenience of operating the vehicle. In any case the decrease of satisfaction assessment creates a threat of losing the client for the enterprise in prospect.

Organizing and conducting joint research in the areas of reliability and customer satisfaction with perceptible quality of autos should be performed in two key aspects (Figure 4): upgrading the system of quantitative reliability



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ratings in auto operation employed at the enterprise in terms of possible joint utilization together with customer satisfaction rating of perceptible product quality; development and employment of questionnaires integrating the possibilities of deep quantitative and qualitative analysis based on the customer satisfaction score assessment, wide in all aspects of qualitative field of question base, and implementing new quantitative rating capable of ensuring the research process of satisfaction information convergence with the data registered while eliminating defects at service centers.

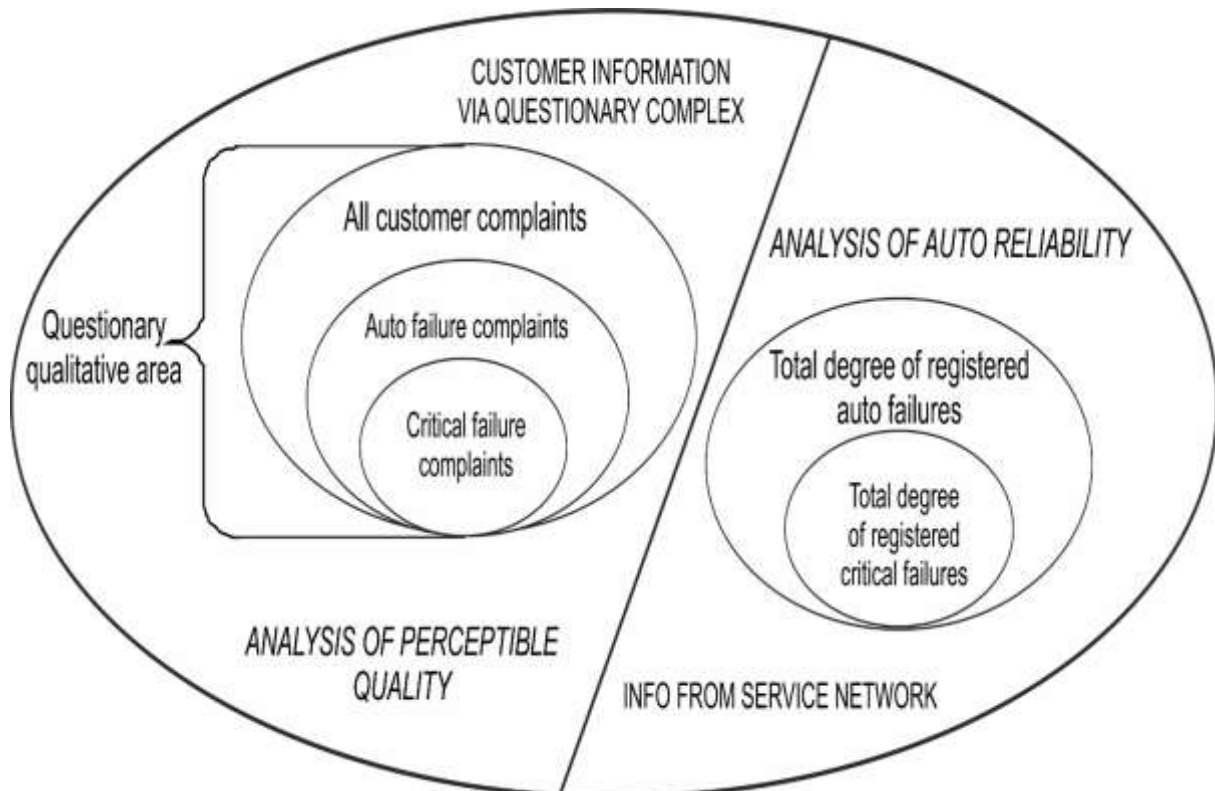


Figure 4. System model of joint research of reliability and perceptible quality of autos in use

Regarding the first aspect it can be noted that conventionally many Russian manufacturers employ the quality rating system of autos in operation, which is tied up to the averaged motor vehicle park under guarantee. Here the transfer to a new rating platform to ensure binding auto failure level to the month of production or sale would resolve three tasks:

- 1) Decrease of miscalculation in quality rating of autos in operation. It is reached by withdrawal from consideration (within the context of the present calculation methodology) of quantitative value of vehicle park under guarantee as a multifactor rate where it is rather complicated to take into account the volume of marketed new autos and their exit outside the warranty service period. Besides, many automotive manufacturers employ the warranty system using varying time limit for different functional systems, and they are hard to assess within the existing calculation forms. Also, a number of enterprises execute a very complicated structure of warranty car park where part of customers obtain excess manufacturer's warranty obligations and they are not easy to consider in calculations.
- 2) The proposed ratings are well corresponded to quantitative quality criteria employed by world automotive and marketing leaders, which creates additional premises for raising efficiency of benchmarking processes.
- 3) The nature of new ratings is more understandable and explicable. In both expert and consumer groups it is considered equally as a coerced level of registered failures in the vehicles with a fixed production or sale date and operating period.



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Another aspect worth considering before switching to the next work aspect is the problem of structuring new quality ratings. To ensure harmonious connection in the research system it is essential to take into account that beside the failures corrected in the normal way there are failures leading to vehicle immobility. Such failures are considered by customers as most critical. Present-day research practices show that even a single failure of this kind during the first year of operation nullifies the rating of customer loyalty to the brand. The car possession price is also an important criterion of quality assessment both for a product manufacturer and a consumer. For the manufacturer it is a tool of budget planning to fulfill guarantee obligations. For the consumer it is his own budget in order to support vehicle operation efficiency. No doubt that the structure of operating vehicle quality ratings should embrace at least three criteria defining general level, critical level and cost estimation equivalent of general level of failures.

When implementing the second work aspect we will first stop at the new satisfaction assessment rating providing for research process of data convergence obtained in analysis of reliability and perceptible quality. In our opinion, the nature of this rating should correspond to the general failure level criterion considered above. The natural difference of the proposed satisfaction assessment from the failure level rating lies in the fact that within the framework of questionnaire complex it can be presented as an integral one embracing all problem information received in a qualitative (text) form from the customers (Figure 4). This allows for a possibility of expanding the horizon of representing the data regarding customer satisfaction with perceptible product quality. Thus the problem segments may be singled out in the integral assessment by the general complaints level, by general failure level as well as by the critical failure level, and to implement this question base of the complex should be compiled.

The principles of generating the subject matter area and organizing the research process based on questionnaire complexes as tools for measuring perceptible product quality are illustrated in Figure 5.

When conducting research of perceptible new product quality it is essential to mark the limits in regard to participating respondents. The research should not include so called expert customer groups, like taxi drivers, automotive industry workers and service specialists. What is more, if a representative of expert society is a member of potential respondent's family, his participation in research is dismissed.

The research is conducted on the developed customers' data base. Practice indicates that the base formation is one of the most complicated tasks. There is so called polling process hit ratio criterion. The criterion may be equal "one" only in case the customer being polled responded to all base questions. In Western Europe only 15 to 20 per cent of 1000 potential respondents consent to be polled. In Russia this percentage is even lower and it amounts to about 10% to 15%. For all this it is necessary to take into account the criterion of customer distribution across the geographic regions depending on the product sales.

The questionnaires containing about thirty questions with keys providing transfers inside the question base depending on customers' answers are structured to ensure the transfer from the general to the particular in the polling process, i.e. from the score assessment of customer satisfaction in general to satisfaction with particular system work quality. At each step the customer is provided with the opportunity to present the scope of information in quality terms, and verbatim at that. After interpreting the results just that very field is used for calculation of integral satisfaction assessment. The questionnaire offers a block of questions arousing emotional tinge in the customer's answers – the so called "like – dislike" block.

The polling results form a so called "raw", i.e. unprocessed, data base of customer satisfaction with perceptible product quality. It is compiled in the form of a computer table to ensure processing effectiveness. It is followed by on-line analysis for producing a brief report, and in-depth data analysis for preparing a full report.

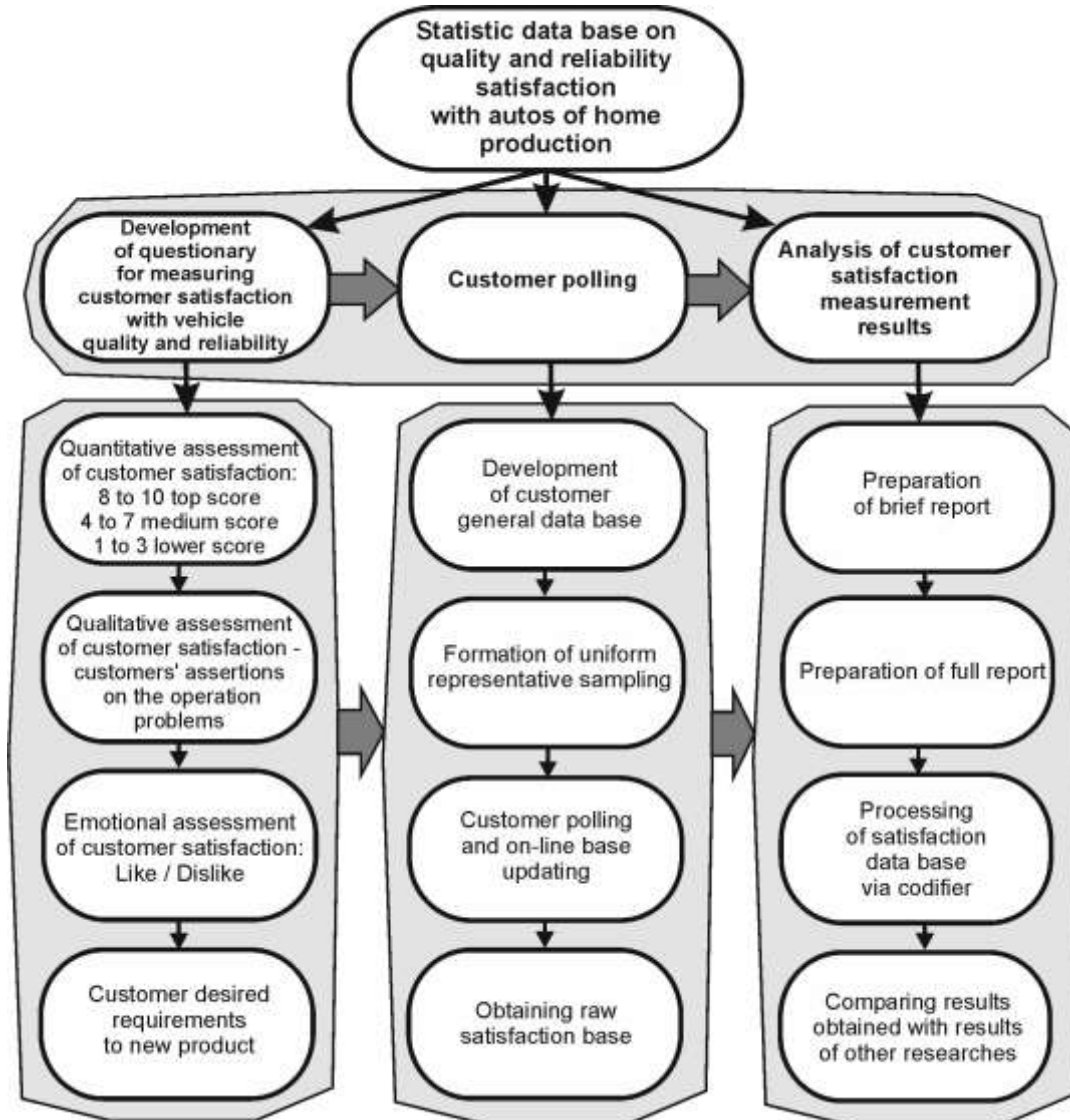


Figure 5. Model of perceptible auto quality research process

The brief report reflects general tendencies in defining customer satisfaction and ensures formation of the basis of the full report containing detailed consideration of practically each problem exposed in the process of research.

As an example we can demonstrate some forms of perceptible auto quality research results based on twelve month operation of three car models. The first and the second model are the home production autos, and the third is the competitor's product. The diagram presented in Figure 6 deals with customer satisfaction analysis split into functional automobile sectors using score point assessment. The comparative analysis of satisfaction (Figure 6) is conducted relative to Model 3 of the competitor's automobile. The level of satisfaction score point assessment in functional sectors and its variation range from the smallest to the largest values are used as the basic criteria of the diagram assessment.

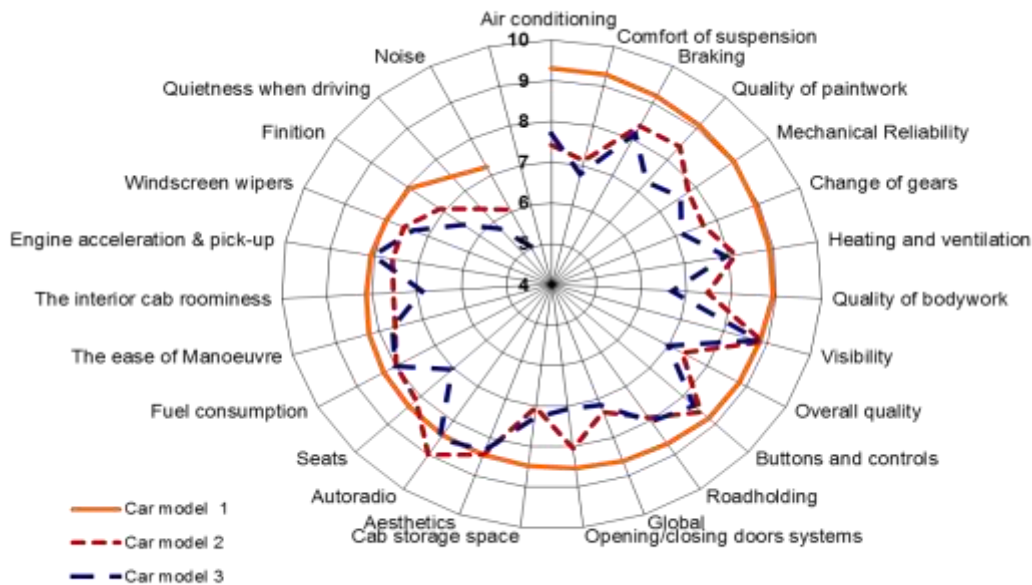


Figure 6. Diagram of comparing score points of customer satisfaction assessment split across functional automobile sectors

Comparison of emotional characteristics of customer satisfaction with the automobile quality is presented in Figure 7. It is worth noting that the emotional tinge in the customer's answers is measured by way of analyzing the questionnaire sectors with qualitative information presentation. In general such kind of analysis is a separate formalized technology. In leading automotive corporations the analytical groups of experts carry out analysis and interpretation of customer expressed opinion. They use the tools that allow to codify the qualitative sector of questionnaires according to automobile systems to ensure effectiveness in interpreting the customer opinion to the language of engineering.

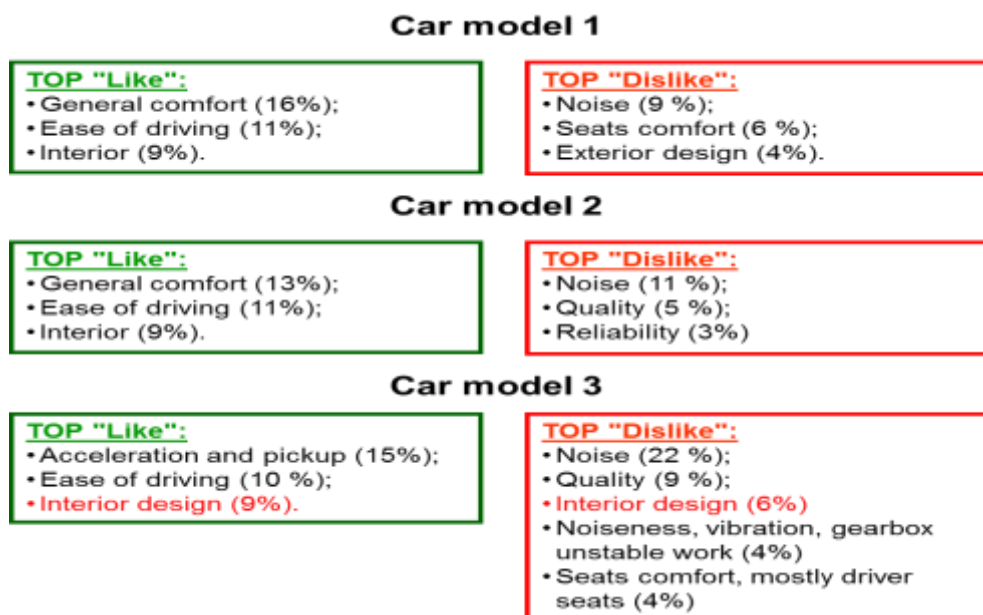


Figure 7. Emotional assessment of perceptible quality of autos



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Figure 8 demonstrates the distribution diagram of integral satisfaction assessment (E%) to reflect the presented level of customer complaints split across functional automobile sectors.

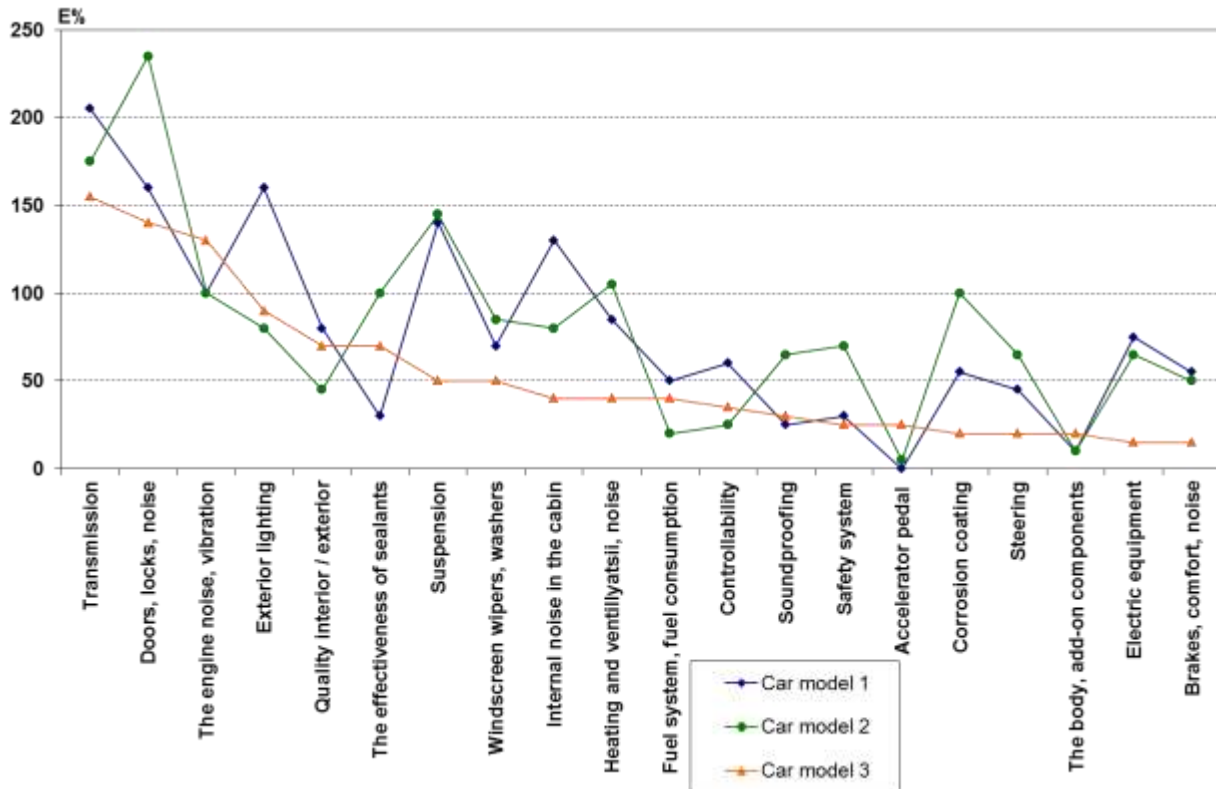


Figure 8. Distribution of integral customer perceptible quality satisfaction assessment

Now, coming back to the joint quality research system of Figure 4 we note the presence of common areas in the results of work in the specified key directions (reliability and perceptible quality) contained in failure sectors. The obvious advantage of the results obtained here is the possibility to analyze information from different sources for the purpose of data convergence, which provides for making conclusions as to the product quality with a high level of confidence, in consideration of weight of the wide problem pattern influence on the customer satisfaction.

The quality measurement principles discussed above are employed today in the work of world biggest automotive corporations. They implement questionnaire complex research both for their own and their competitors' products through the benchmarking tools and contracting competent expert marketing institutions. For instance, one of the institutions dealing with perceptible auto quality assessment in the U.S. is the Consumers Union. The Union magazine The Consumer Reports keeps publishing the results of new car model tests and the results of statistic handling of perceptible quality information received from their readers answering the questionnaires forwarded to them. The analysis of data obtained from 600 to 700 thousand car owners regarding car failures of over 200 models in different categories allow for quite an objective judgement of their reliability. In Europe a popular perceptible auto quality rating of the German Technischer Uberwachungs-verein is one of the most authoritative ratings for both the manufacturers and the consumers. The basic criterion defining the quality of this or that car model is the statistic data from the largest E.U. automobile market. The basis of TUV rating lies in the results of official checkup mandatory to pass in TUV units for every automobile registered in Germany. The volume of the car park undergoing annual checkup by TUV practically excludes the possibility of error. Immense authority in assessing perceptible auto quality on the world market belongs to J. D. Power, a U.S. company. J. D. Power carries out their researches in North America, Europe et al. They are polling new car owners (vehicles under 3 months). The owners assess their cars in two categories: design and ergonomics, including convenience of instruments on



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the dashboard and manufacture quality, judged by the number of failures. J. D. Power pays great attention to electronic and multimedia systems, with the number of them in automobiles growing more and more.

Presently new forms of cooperation among automotive manufacturers appear, like clubs organized for compiling multi-brand questionnaire complexes taking into account participants' specific wishes. Within the framework of the club all the package of works is carried out, starting with questionnaire formation up to presentation of results, that each of the manufacturers interpret on the basis of their internal corporate standards.

CONCLUSION

In conclusion it should be mentioned that the questionnaire complex research in the field of perceptible auto quality assessment is permanently upgrading based on the following factors: development of automobile component base directed at improving comfort and convenience in operation; new trends in automotive production – electro-mobiles and vehicles with combined engine units; development of associated service technologies, etc.

Hereby, at present we witness substantial development of analytic methods of auto quality measurement oriented towards customer assessment, which in the aggregate with conventional service data ensure more complete representation of conclusions regarding the current level of product competitive ability and provide for development and implementation of strategic product quality planning process.

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