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Digital Diagnostic Tester in Repair Shops

Defying the Shortage of Skilled Workers with Remote Expert Support!

New technologies and systems in modern vehicles are presenting service repair shops with massive challenges: Maintenance and repair are becoming increasingly complex and require greater understanding of system interdependencies. The shortage of skilled workers further exacerbates the glaring gap between the expertise required and the expertise available locally. Remote experts help to close this gap, make business processes more efficient, and establish service-oriented business models in after-sales.

Julian Mayer

Technical innovations in the automotive industry are becoming ever more dynamic due to data- and software-driven engineering: Digitization is the key. This means vehicle functions are already being realized beyond the "vehicle system boundary". The result: The efficient maintenance and repair of coming vehicle generations are becoming increasingly complex. This is only possible with highly specialized skills and support from digital diagnostic testers in repair shops. In addition, the speed of change and function updates from engineering and development is increasing noticeably. From a corporate perspective, this paradigm shift has a fundamental impact on the service processes in after-sales. In the future, repair shops and dealers will have to adapt their expertise – the maintenance and repair of vehicles – even more quickly to the changing conditions and innovations. The challenge is for them to keep in step with the continuously increasing pace of engineering and function updates by vehicle and component manufacturers. They need to acquire new knowledge fast and constantly keep it up to date. The latest diagnostic testers for after-sales offer solutions that go beyond that, e.g. In the form of integrated remote expert support, and thus facilitate the technical and organizational implementation of digital solutions.

New Complexity in Repair Shops Impossible to Reduce without Skilled Workers

Highly complex vehicle architectures pose immense challenges for both repair shops and mobile repair teams. The engineering cycle is getting shorter – there will be a more frequent flow of function -updates. Particularly vehicle models new to the market pose problems for repair shop staff because there are

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hardly any empirical values for occurring error patterns. This results in a time gap between the technical knowledge required and what is actually available in the repair shop. The aim of efficient maintenance and repair becomes a distant prospect without the knowledge of qualified mechanics and expertise in the relevant area. Not only is mechanics' knowledge of current maintenance and repair procedures not up to date or even non-existent due to a lack of tools, processes and training. The acute lack of skilled workers aggravates the situation further. According to a recent survey of members of the German Association of the Automotive Industry (VDA), 77.6% of respondents see the shortage of skilled workers as one of the greatest challenges of the future.

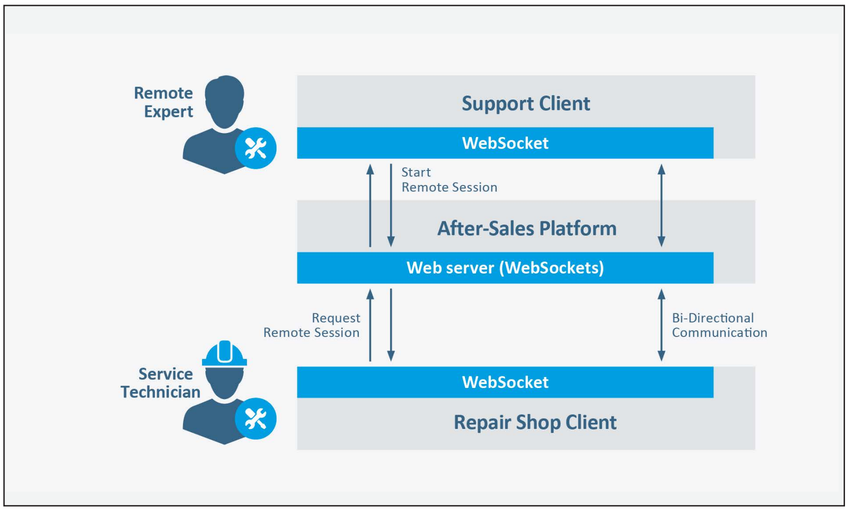

***Figure 1** Bi-directional communication between remote expert and service technician using the WebSocket protocol* © Softing

Only current electricity prices were seen as being a greater challenge at 81.9%. The solution is to make existing expert knowledge available to the repair shops at the right time and place with suitable technologies.

Remote Experts Bring Consolidation and Extend the Service

The majority of after-sales diagnostic testers on the market already support service technicians by providing appropriate repair documents or manuals to guide them during a repair. These are shown directly in the service tool, depending on the individual situation. Some even also offer additional video material showing exactly how to carry out a specific repair. The problem: The documentation is not always up to date and is at times unsuitable as support for one technician when it comes to solving unknown interdependencies, as described above. That means, expert knowledge is absolutely essential for some cases if a result is to be achieved. The focus of after-sales is to effectively and efficiently identify and remedy the causes of errors in vehicles. This is hardly possible without the right expertise – particularly when it comes to the latest vehicle generations. The concept of the remote expert is absolutely perfect in this scenario. Remote expert solutions are tools which facilitate collaboration in after-sales service when it comes to solving technical problems. They make it possible for local service technicians working on the vehicle to establish virtual contact with specialists to obtain instructions from afar. The fact that the service technician is getting help from a remote expert means that possible causes of error can be found and also remedied more quickly. Sometimes, having a system of dual control in place is sufficient to find a solution fast. This applies all the more in the case of more complicated issues in which the local mechanic may not have the required expertise. Furthermore, remote support can also help when it comes to deciding on an appropriate measure – in the case of errors that are not clear-cut, e.g. whether or not to exchange an ECU at great expense, which in fact might not be necessary. The remote expert could well have suggestions for such unclear situations which result in the error being solved at lower cost. Sometimes, remote experts can even carry out the complete measure themselves. A few examples include the parameterization of ECUs, software updates or other tasks the local service technicians are not qualified for. These use cases can be carried out easily by remote experts, for safety reasons under observation by the local service technician. If the process is started one stage earlier, mechanics can also attend training sessions and workshops in a remote form. This avoids extensive business trips and also saves time and money.

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Remote Expert Support in Operational Use

The possibilities of using remote expert support are manifold, the potential enormous. But how can remote support be put into operational use? First of all, there has to be a suitable technological basis. Softing TDX is an after-sales solution with built-in remote expert support. The WebSocket protocol is used to realize the remote support by connecting the two applications “repair shop client” and “support client” with each other via a central server. The bi-directional communication enables the efficient and dynamic exchange of data. This makes the protocol particularly ideal for real-time applications which is exactly what is needed for remote expert support as well as additional chat functionality. In this scenario, the graphic content of the repair shop application is transferred and controlled from a distance by the support. The special feature: Only the interface of the application itself is transferred, but extensive rights of the whole PC are not released. This means that this solution is advantageous in comparison to standard remote desktop protocols (RDP) in terms of data security and data protection. The protocol is based on TCP/IP and thus offers the standard security (TLS) of communication over the Internet.

Thanks to the central server component with its interfaces (APIs), it is also possible to connect to existing support management systems with this solution and thus use existing infrastructure and processes.

The remote support request is issued directly from the repair shop applications by the service technician. The central server checks and verifies whether this request is allowed. In this process, other

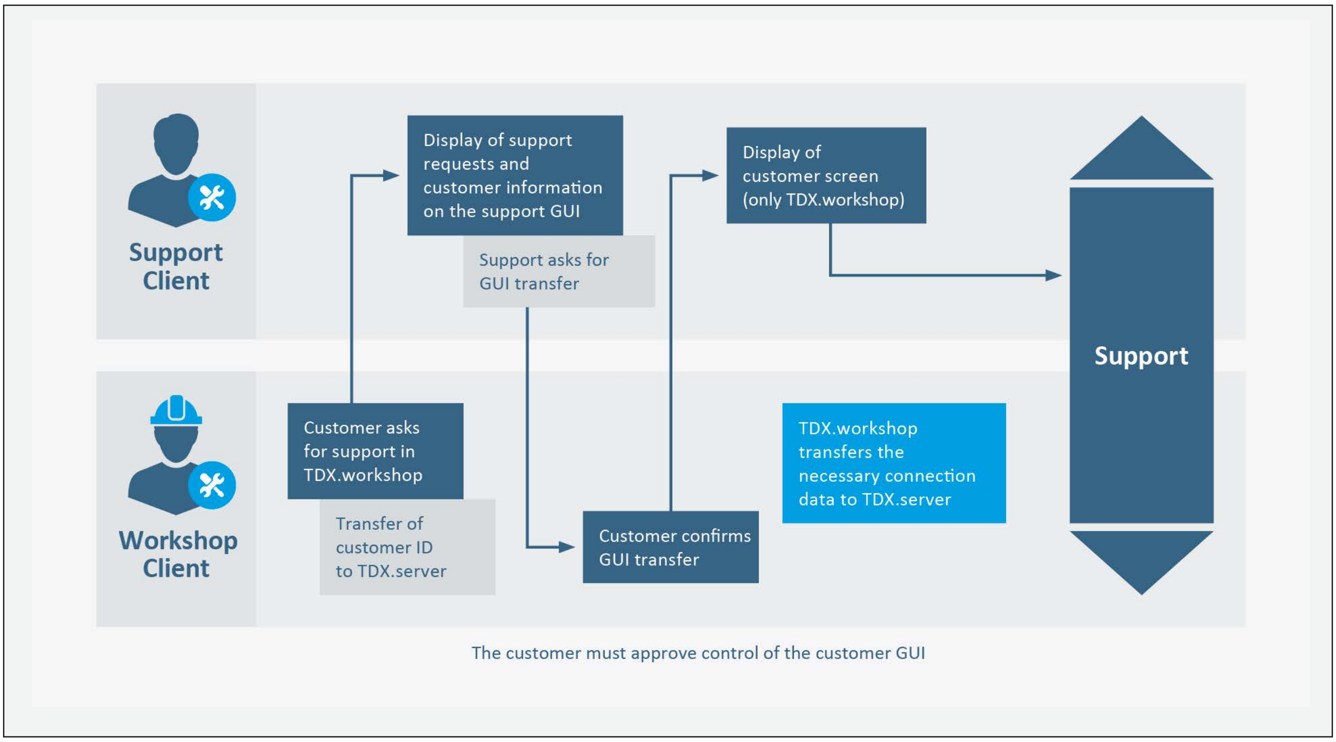

***Figure 2** Workflow on the setup of the bidirectional support channel* © Softing

data, such as user IDs, name of the repair shop, place, type of request and description can be transmitted directly. After successful authentication and authorization, the request is stored in a pipeline of the support client. The remote expert now selects the relevant support case from a list. The remote support session is started by remote support and is displayed on the repair shop client screen. This is confirmed by the mechanic and the remote session starts. Bi-directional communication makes it possible for the session to be ended either by the support or the repair shop client.

Digital Business Processes Increase Competitiveness and Provide the Basis for Service-Oriented Models in Automotive After-Sales

Remote experts help to enable maintenance and repair processes and make them more efficient. By implementing digital technologies, they ensure the smooth running of processes in after-sales, regardless of the physical presence of experts and their knowledge on site. This results not only in efficiency and cost advantages in the form of reduced travel expenses. The increased service quality results in an increase in customer loyalty which in turn secures future orders. Furthermore, the introduction of digital technologies and processes into the organization facilitates a change towards service-oriented business models. Free, Freemium or Pay per Use are just a few of these models. The company’s own range of services can thus be expanded, creating opportunities for additional business. The advantage of these solutions is their high flexibility that can be adapted to suit every company and any individual strategy. This results in a “win-win-win situation”. For the OEMs themselves, training sessions can be reduced and services can be invoiced as part of remote support. The advantage for repair shops and dealers is that more vehicles can be repaired with fewer employees. The amount of training necessary for the local service technicians is also reduced. And at the end of the day, customer satisfaction is higher because their vehicles can be repaired more quickly.

Conclusion

The gap between what is required on site in the repair shops and the level of expertise actually available is becoming ever greater. Drivers of this development are more complex maintenance and repair processes as well as a lack of skilled workers. This is why technology and innovation, particularly also in after-sales, have to play a major role in the optimization of the repair and maintenance of the latest vehicle generations. Diagnostic testers with integrated remote expert support, that guide the local mechanic, make a valuable contribution here. This results in more efficient service processes as well as increased customer satisfaction and loyalty. In addition, these possibilities make it easier to introduce service-oriented business models in the company, which strengthens the range of services and thus future business potential.

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MBA & engineer Julian Mayer is a product manager responisble for after-sales diagnostics and Softing TDX at Softing Automotive Electronis © Softing

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