Integrated service portal with web-based, co-operative diagnostics

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STILL GmbH is a manufacturer of forklift trucks who provides a world-wide service network to his customers. 4,500 service technicians support a sophisticated overall system consisting of forklift trucks, warehouse technology, and intralogistics. Vehicles and devices are very complex and are available in many variants. A modern forklift truck is often containing 15–20 electronic control units for diverse functional areas like e.g. lifting, driving, energy management and driver assistance. High variance is resulting from support of modern technologies, from integration of products into individual customer environments, and from the commitment to service trucks of every generation for more than 15 years.

Requirements are thus increasing continuously for the availability of information to technicians. STILL is providing a comprehensive service information system. In its youngest generation this is a web-based information portal, presenting a multitude of information by means of uniform user interface and navigation. Thus, it is guaranteed that the system can be used easily and intuitively. A suite of system components is thus made accessible for any technician, e.g. fleet management, spare parts management, vehicle data analytics, and vehicle diagnostics.

Diagnostics cause special challenges, because a diagnostic system does not only access information sources centrally prepared, but also has to evaluate live data from a vehicle. A technician's diagnostics notebook is often representing the one bridge between a vehicle at a customer and the information network of the manufacturer.

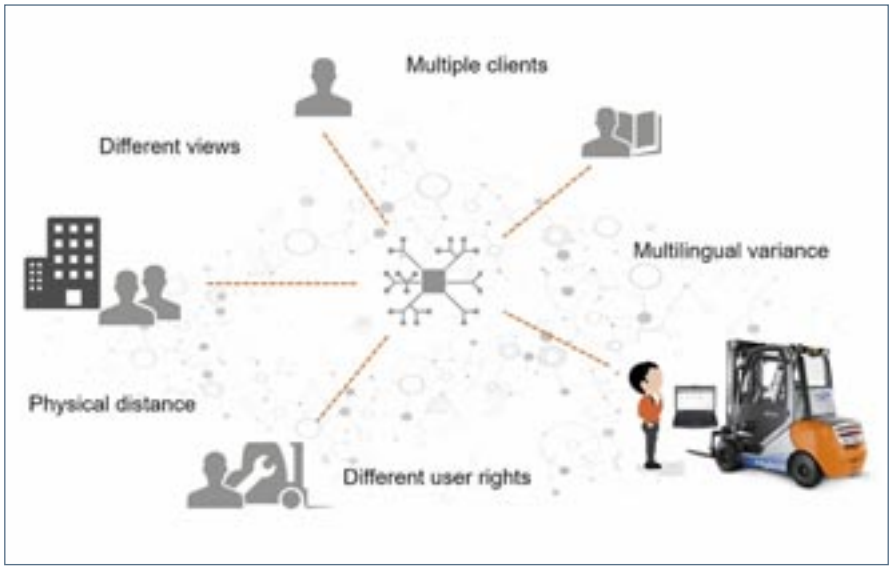

Illustration 1: Worldwide, web-based, co-operative diagnostics

At a typical service incident, the situation may arise that a technician on-site "is at a loss", or that he lacks the access rights necessary to solve the problem. In such a case he contacts by phone either his coach, a colleague in the vicinity, or a support expert in the service central. If the support by phone is not successful, the coach or the colleague drive to the problem site themselves, thus causing a significant prolongation of the downtime of the vehicle as well as additional costs for manufacturer and customer.

STILL is therefore restructuring their diagnostic solution in such a way, that seamless integration into the service information system is facilitated, while simultaneously optimizing remote support. A support expert gets the opportunity to participate in a running diagnostic session from the distance via the internet. He thus gets access to the same data and screens that the technician sees. He also gets the means to actively intervene in the session and influence the vehicle.

The principle of "co-operative diagnostics" combines the advantages of remote diagnostics and screen sharing while avoiding their disadvantages: When doing plain remote diagnostics the expert has no physical access to the vehicle, when doing screen sharing the expert is restricted to the view of the on-site technician of the system and the vehicle. Co-operative diagnostics allow the expert to make use of his own access rights to gain access to extended functionality of the system. He also may execute investigative steps in parallel and independent of the technician's activities on-site. At the same time the technician on-site maintains sovereignty and full control of the vehicle and the diagnostic session in all aspects relevant to security.

The introduction of a new diagnostic system poses significant challenges to vehicle manufacturers with respect to the compatibility with "old" diagnostics for "old" vehicle generations. Migrating existing diagnostics data into a new system environment is often so difficult, that only new vehicles are supported by the new system, while the old system is put into the new solution as a subsystem to support old vehicles.

STILL decided to use a different strategy together with their provider of the diagnostic system, ServiceXpert Gesellschaft für Service-Informationssysteme. The core functionality of the existing system, i.e. the evaluation of

Illustration 2: Multilingual, co-operative support for a technician on-site

diagnostics information and the communication with vehicles, has been separated into an individual module, the so-called diagnostics server. This server is providing a web-service interface for access to all data relevant for the presentation of diagnostic information. Thus, the compatibility with legacy diagnostics and old vehicle generations is secured. At the same time a newly designed web-client provides smooth integration of the diagnostics system into the overall service information system.

The web-service interface is facilitating remote access to the diagnostics server, as well as concurrent access by several co-operating clients. The live connection is further improved by providing all textual information to any client in its own language. Thus, a support expert speaking e.g. German can support a Korean colleague without language barrier.

The accessibility of a diagnostic session by several users also provides the means to access that session from several mobile devices. Thus, a technician can optimize his work performance by using e.g. a tablet computer, his smartphone, or modern data glasses to display data and instructions from the diagnostic system.

The new approach also provides the opportunity to move the diagnostic system as well as its underlying data base into the vehicle. This is made possible by the diagnostics server design making it independent of any user interface. Thus, a technician is no longer required to maintain diagnostic information for potentially all vehicle variants and generations on his computer. First steps have already been taken to have the diagnostics system run on a web-enabled on-board computer in the medium-term.

The diagnostic system and engineering service provider ServiceXpert is supporting customers like STILL GmbH in the customer-specific adaptation of the diagnostic system DiaMon. The system is continuously extended by state-of-the-art functionality. ServiceXpert's engineers interpret diagnostics for 20 years as a comprehensive feature ranging from vehicle development to after-sales service. ■

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