The workshop organization of the future is efficient

Planning of personnel and maintenance tasks thanks to digital assistants

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Efficient workshop planning and organization are indispensable for handling the increasingly complex maintenance tasks of transport companies and maintenance service providers. The challenge is to ensure the required high availability of vehicles and equipment with existing resources. In this context, the resource of employees is becoming increasingly important - workshops are in competition for new employees. Long-standing employees with specialized knowledge leave the company due to age, new specialists are not sufficiently available, and specialized knowledge and professional experience are lost.

That's why smart solutions are needed that bring transparency to resource requirements and availability and provide intelligent support for the planning tasks ahead. Long-term personnel requirements planning is essential to ensure that the workshop is well staffed for the future. In order to ensure this, it is necessary to have an overall view of all maintenance tasks and the resulting personnel requirements: Which preventive maintenance tasks result in the long term from the determined time-, load- or condition-dependent due dates? Which corrective maintenance tasks result from the existing experience values? What can be deduced from this about the resource requirements for the workshops? Can the qualification of employees for special tasks be ensured?

The more complex the workshop organization and the greater the requirements, the more difficult it is to answer these questions with Excel lists and planning tables. Modern specialized software systems for the maintenance of rail vehicles such as zedas®asset support the workshop manager in consolidating all necessary data, mapping it transparently and deriving conclusions for an efficient workshop organization.

Prognosis of staffing needs

The challenge with manually executed personnel planning is the compilation of data on personnel, maintenance history and maintenance planning as well as the master data of the vehicles. Bringing together this data - often from different departments - takes a lot of time and is prone to errors. The digitalisation of the personnel demand forecast makes it possible to correlate different parameters at the push of a button.

Tab. 1: Factors influencing the staff demand forecast.

Staff	Maintenance tasks	Asset master data
Number of employees	Due date Deadlines incl. required resources	Installation age
Work schedules	Forecasted effort for fault elimination incl. required resources	State
Valid skills	Planned rolling cures/ other measures	planned renewal
		Intensity of use

Fig. 1: Screenshot zedas®asset Advanced – Personnel demand forecast.

The personnel demand forecast of zedas®asset (Fig. 1) enables the user different scenarios:

- For which period should the demand be forecast?
- Should a forecast be made for both preventive and corrective tasks?
- Should only the demand for individual occupational groups or skills be determined?
- What influence do shortened working hours or fluctuating employee numbers have?

By documenting maintenance in the zedas®asset system, the data used to determine long-term personnel requirements is created practically as a "waste product". In this way, bottlenecks that can arise due to the accumulation of certain due dates, lower personnel availability due to vacation, etc., are identified at an early stage. The necessary rescheduling resulting from the consideration of these bottlenecks is possible directly from the dashboard. For example, maintenance measures can be postponed to a month in which the necessary resources are available.

Mobile workshop assistant

It is not only the forecasting of personnel requirements that poses a challenge in the personnel management of maintenance staff, but also the optimized deployment of personnel in day-to-day workshop operations.

Paperless documentation in a maintenance system ensures that data is stored in

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accordance with the rules. At the same time, all the necessary information is always available to the employee in the workshop in the current version. Thanks to mobile applications, access to orders, work statuses and work steps is possible directly at the workplace. Input fields and selection options ensure that the employee saves all necessary data without errors. The system functions are constantly being further developed as part of the release development. The zedas®asset Touch application combines digital process support and user-friendliness to provide even better support for workshop employees in their tasks and documentation obligations and to accelerate work processes in maintenance.
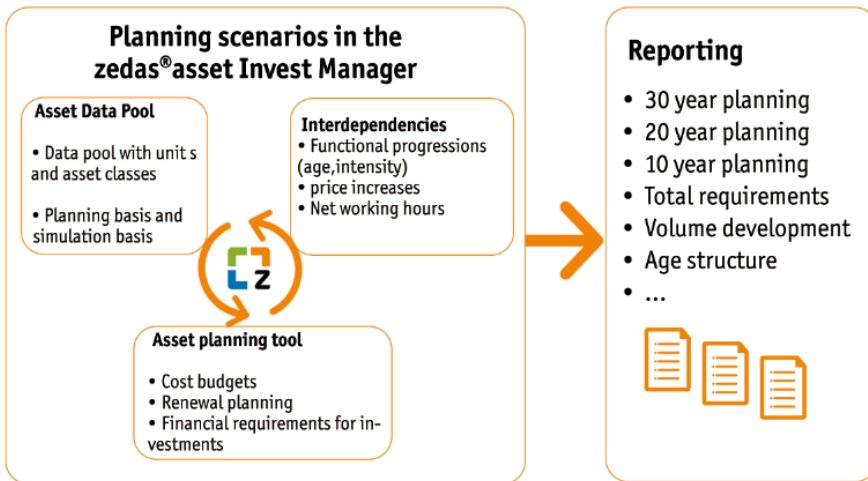
Checklists for optimal workshop processes

By using freely definable checklists, employees can work through their maintenance tasks step by step. The specific data entry enables deadline processing, fault and defect recording. The setting of mandatory fields helps the employee to avoid errors. The degree of automation of the maintenance documentation s increased, the up-to-dateness of the valid work instructions is ensured.

Fig 2: zedas®asset Touch.   Screenshot: Zedas

With the use of the mobile assistant, the maintenance organization benefits from a complete, correct and consistent database as the basis for meaningful analyses and forecasts of maintenance, personnel and investment requirements.

Planning scenarios in the zedas®asset Invest Manager

Asset Data Pool
- Data pool with unit s and asset classes
- Planning basis and simulation basis

Interdependencies
- Functional progressions (age,intensity)
- price increases
- Net working hours

Asset planning tool
- Cost budgets
- Renewal planning
- Financial requirements for investments

Reporting
- 30 year planning
- 20 year planning
- 10 year planning
- Total requirements
- Volume development
- Age structure
- ...

Fig. 3: Planning scenarios in the zedas®asset Invest Manager.

Graphic: Zedas

Invest Manager

Through the digitalisation of workshop processes, a large amount of data is collected and documented, which can be used for further analyses. Thus, in addition to the resource requirement forecast for personnel and material, the data stock also enables the requirement forecast of necessary investments for equipment maintenance and equipment procurement, for example over the next ten years.

This is where the management solution from Zedas comes in and uses the collected data from the maintenance and asset documentation for the optimal planning of future investments. The Invest Manager enables the:

— short-, medium- and long-term planning based on actual and forecasted conditions,

— Justification of the need for funds,
— fast reaction to market dynamics, changed contractual relationships, conditions, allocation of funds and

— automated calculation when using the existing zedas®asset database.

Outlook - assistance systems in the workshop

More and better available data make the maintenance process more transparent and enable the provision of information, instructions, recommended actions at every stage of the work process in the workshop. Artificial intelligence methods are used to analyze and process this data.

For example, Zedas is working on the prototype development of an AI-based assistance system. Via an innovative user interface, the user is shown all the information required for the work process on a pair of data glasses. Work processes and checklists are then processed by voice control, and visual instructions can guide the user step by step through difficult tasks, thus guiding even an inexperienced employee through the process.

The use of this system is intended to support workshops and mobile service teams in managing their tasks, despite the expected growing shortage of skilled workers, increased requirements for documentation obligations and compliance with safety standards.

Summary

Workshop organization of the future is efficient

Modern specialized software systems for the maintenance of rail vehicles support transport companies and maintenance service providers in dealing with increasingly complex tasks in workshop planning. The digitization of all data required for the maintenance process offers the possibility to clearly consolidate existing resources and upcoming maintenance tasks, to map them transparently and to derive conclusions for an efficient organization of the workshop. Employees are becoming an increasingly important resource in this context – just think of the shortage of skilled workers. Long-term personnel planning is essential for workshops that shall also well staffed in the future. This is where the digital personnel requirements forecast of zedas@asset comes in. At the push of a button this tool correlates various parameters from the data of the maintenance tasks to be handled. The deploy-ment of workshop personnel can be optimized with the help of digital assistants. Mobile applications combine digital process support and user-friendliness. They allow to access orders, work statuses and work steps directly at the place of work, which in tern supports compliant documentation obligations and accelerates work processes. The digi-tization of workshop processes allows to collect and document a large amount of data, which can also be used, for example, for an optimal planning of future investments.