

The right way to achieve changes



Figure 1: Green track at the Westplatz stop, Leipzig © Leipziger Gruppe

Introduction of a future-oriented plant management system at the Leipziger Verkehr Betrieben (LVB)

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During the past few years, the cost pressure on local transport companies has increasingly resulted in assets being managed more efficiently. Digitalisation now makes many things possible, but makes it more necessary to be careful about the concerns and perceptions of employees when implementing complex systems. The market already offers some very well-performing tools for supporting the processes which accompany the life cycle of an asset. The use of such professional tools helps to establish an important foundation for achiev-

ing transparency, improving efficiency, and optimising the work for maintenance personnel/ asset managers.

Naturally, the introduction of such IT systems is all about the correct illustration of the fixed assets, as well as the establishment of appropriate analysis and reporting options. But the question of the manner in which such a system is implemented in a company must also be asked. This article focuses on this key management view. What does the change which goes along with this mean for the employees? What are their concerns?

How can the acceptance which leads to sustainable success be established? The fact is: you don't normally get a second chance. If acceptance of the "new way of working", recognition of the benefits, and willingness to change are not established, then the effect will not be sustainable. Readjustment generally does not achieve the desired successes.

The example of the introduction of the asset management system (AMS) zedas@asset for optimisation of the management of route infrastructure at Leipziger

Verkehrsbetriebe (LVB) demonstrates what should be borne in mind, from a management view, to make a large-scale IT project a success.

Initial parameters

The Leipziger Verkehrsbetriebe route infrastructure has the following technical parameters:

- 306 km of tracks in various designs
- 326 km of overhead lines in various designs
- 732 stops
- 1,090 km of railway power cables
- 63 signal controls, and
- 186 points switches

The management structures were divided into two separate parts, strict hierarchical structures were established, and each were given their own objectives. In the past, many stand-alone IT solutions which were only integrated into the principal commercial system in individual cases were established for the management of

such complex and extensive fixed assets. These solutions, while very professional, only allowed for isolated, unconsolidated views, and did not allow complex connections to be recognised. Evaluations or reports were only possible with a great deal of effort. Comprehensive analysis of the existing system landscape and the establishment of specifications were followed by an application and negotiation procedure. The aim was to review whether the many stand-alone solutions were required, to merge those which remained, and to integrate these into the principal commercial system. New management needs were also formulated and incorporated in the process. ZEDAS GmbH, a provider of industry-specific solutions for the computer-based management of vehicle fleets, railway systems, and logistics processes, was awarded the contract. The functionally complex infrastructure of the modular zedas@asset asset life cycle software solution was specifically designed for universal support, monitoring, and documentation of the

maintenance processes for extensive linear railway infrastructure systems. After intensive analysis by ZEDAS GmbH of the actual state and the software products to be replaced, an ambitious common project plan was defined and the target state for the functions, workflows, and processes was set out in detail. In the initial project phase, zedas@asset is used for the track construction division incl. interfaces with the inspection module, the ERP system (enterprise resource planning) for cost assessment of the individual construction measures, and connection with a geo-information system. In addition, the zedas@asset OperationsLog module was adapted to be able to transparently document and manage routes with speed restrictions (see Figure 2). Investment needs in the rail infrastructure are depicted in the newly established zedas@asset demand management module. Information on the condition of the systems and maintenance costs supports later investment decisions.

The screenshot displays the 'Meldung bearbeiten' (Edit Report) interface in the zedas@asset system. The main content area shows a form for defining a route segment with the following fields:

- Typ:** LFS langfristig
- Status:** LFS04 - Erlassen: Prüfung LSA
- Übersicht:** LFS Veranlagungsdaten, LFS Ortsdaten, Dokumente, Verkehrsmanagement
- Startpunkt (S):** Start Trasse (TAS_095.08) m im Trassenabschnitt: 54
- Endpunkt (E-1):** EP1 Trasse (TAS_095.05) m im Trassenabschnitt: 26
- Endpunkt (E2):** EP2 Trasse
- Endpunkt (E3):** EP3 Trasse
- Längen:**
 - Länge S zu E1 [m]: 122
 - Länge S zu E2 [m]:
 - Länge S zu E3 [m]:
 - Gesamtlänge [m]: 122

Below the form is a table titled 'Beteiligte Gleise / Weichen' (Involved Tracks / Switches):

Einheit	Templategattung	Seriennummer	Identnr.	Beschreibung
TAS_095.08	Trassenabschnitt-Gleis		095.08	von: VE 400 Aufleitung Sommerfeld (innen) bis: VE 480 Zusammenführung Sommerfeld
TAS_095.05	Trassenabschnitt-Gleis		095.05	von: VA 439 Zusammenführung Sommerfeld bis: VA 410 Pausendorfer Allee/Pausendorf H
EV_095.04	Weiche	400	095.04	Gleischleite Sommerfeld

The interface also includes a sidebar with navigation options like 'Aufgaben', 'Vorgänge', and 'Zuletzt verwendet', and a top navigation bar with the zedas@asset logo and user information.

Figure 2: Management of routes with speed restrictions

The functionalities of the zedas@asset TrackAnalyser are used to determine the asset status for extensive linear objects such as overhead lines and tracks. Maintenance costs are significantly affected by the usage of service time. Precise knowledge of the services required per maintenance task is necessary for improved planning. Service times are therefore

recorded precisely for each object and measure, and thus provide planning support. The working times recorded are communicated to the ERP system. Results and measurement values from track inspections, track measurements flow into the system via interfaces. zedas@asset thus allows the parties responsible to make short-term assessments and forecasts with regard

to the asset condition. Analyses and statistics must always provide timely information, and must be quick to access and flexibly configurable. The use of the zedas@asset Dashboard (see Figure 3) and zedas@asset web reporting were stipulated in the project plan for this.

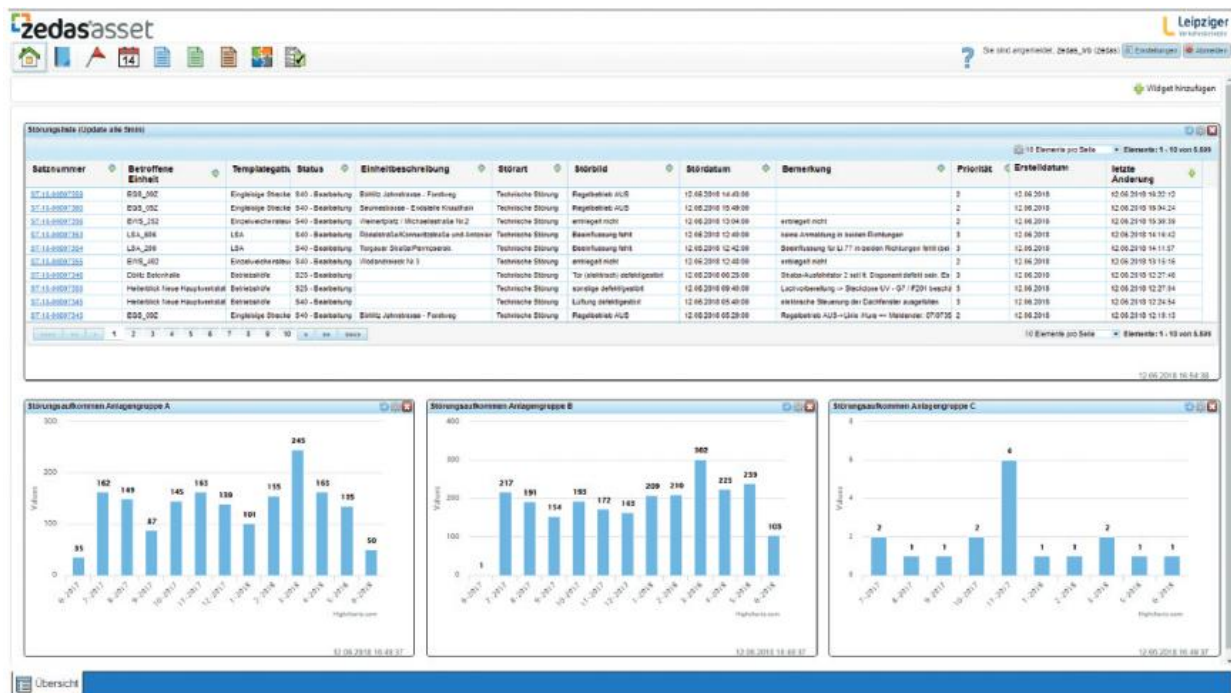


Figure 3: Dashboard showing fault statistics

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In the second project phase, condition data and maintenance histories for assets should be made constantly available on site through the use of mobile zedas@asset solutions. Faults and field data can be recorded and checklists can be edited directly on site on a tablet, laptop, or smartphone. Maintenance and repair jobs are directly and promptly documented in the system once completed, thus making subsequent entries superfluous, as well as significantly improving the quality of documentation and making it more efficient (see Figure 4).

3 Oberbaukomponenten

Nummer	Kennzahl	Bestand am 22.06.2018
3.1	Zungenvorrichtung (ZV_) insgesamt	691 Stück
3.1.1	davon Alter der Zungenvorrichtung (ZV_): < 5 Jahre	68 Stück
3.1.1	davon Alter der Zungenvorrichtung (ZV_): < 5 Jahre	9,84 %
3.1.2	davon Alter der Zungenvorrichtung (ZV_): 5 - < 12 Jahre	126 Stück
3.1.2	davon Alter der Zungenvorrichtung (ZV_): 5 - < 12 Jahre	18,23 %
3.1.3	davon Alter der Zungenvorrichtung (ZV_): 12 - < 20 Jahre	199 Stück

Figure 4: Infrastructure statistics (input date comes from the AMS)

It is thus possible to replace the many stand-alone solutions with one universal and integrated software solution which now easily allows for complex considerations.

Organisational integration

Significant restructuring had already led the way for the introduction of the asset management system (AMS) in 2014. Subprocesses which were separated by company boundaries were put under the control of an overall process according to the logic of the consistent depiction of the life cycle. The first change process resulted in significant streamlining of the processes, an increase in individual employee responsibility, and improvement of the transparency of the work steps and their results. The digital transformation step has been consistently implemented with the introduction of the AMS. All employees in the processes (maintenance personnel, asset managers, etc.) always have access to the same data in the central repository. The consistency and up-to-dateness of the data is guaranteed at all times. Newly introduced reporting allows standardised analyses, which are

necessary for continuous controlling of the condition of the systems –“with one click”. The question of how the individual employee can cope with the accompanying degree of change always arises here, however. If management errors are made during implementation, this can result in complete failure owing to a lack of acceptance among the employees. If the employees are not willing not only to work with such a system, but also to make continuous changes and improvements to the system, then success will fail to materialise.

The common thread

The employees’ basic need for an understandable and plausible explanation for the change and its effects absolutely must be fulfilled. A “story” which creates clarity is therefore needed. Key questions for this may be:

- What is the goal of the change and can it be transparently described?
- What exactly will the change look like?
- What will work (for each individual employee) look like in the future?

- What will be better as a result? What will be possible in general?
- How will awareness that what is being done is good and right be established?

Change management

Initially, analysis of the risk of what could happen if the employees are not persuaded of the necessity and benefits of the measures –if they are not “taken along” –is required. The employees will gain an unevenly increased amount of responsibility in connection with the structural change. The analysis and decision-making tools in the system simply give them the basis for a decision. They themselves are solely responsible for deducing the appropriate measures. Thus, for example, it is their job to identify the availability of points switches with the help of switches and reports. If this worsens, then it is their job to get to the bottom of the causes and propose appropriate measures. The transparency produced by consistent digitalisation does not permit any “possibilities of retreat” in the process steps. Negligence and errors come to

light immediately. Constant documentation of all inputs into the system allows for complete tracing afterwards, even considerably later. The employee's work thus becomes 100% transparent. How does that work with the error culture in the company? The open and constructive, forward-looking handling of errors and discrepancies is an essential foundation for employees

having the courage to make decisions and thus ensures one of the key pillars of the system. Owing to the transparency which is created, the employee may potentially worry that they can be comprehensively monitored. What's more, the employee is accompanied in the optimisation process by the fear

that their job will no longer be required at all in the future owing to digitalisation.

The vale of tears

Substantial changes generally always follow a similar pattern (see Figure 5):



Figure 5: The 8 phases of transformation

1. Status quo/foreboding	Current method of work, slight to strong concern
2. Shock situation	Incredulous alarm, rejection of the change
3. Denial	Anti-change attitude, wait-and-see attitude, little "forward" movement
4. Rational understanding ("yes, but..." phase)	Confrontation of the change and own attitude to it, still positive evaluation of their own competence in the change process
5. Emotional acceptance	Negative evaluation of their own competence in the change process, resignation
6. Trial and error phase	Concrete and active interaction with new requirements and tasks
7. Understanding	Active working and increasing of their own competence, increase in self-confidence
8. Integration	Routines in dealing with new requirements, integration of new work methods into day-to-day work

Table 1: The 8 phases of transformation

The managers' key role is to guide and support the employees through these eight phases of the change. It is important, here, to be aware that each employee is going through this development in their own perception.

At this point, it is essential to consider whether there is sufficient expertise within the company to take on the challenge of this very intensive guidance process, or whether it would be helpful to call in experts as consultants as required. It is also necessary, in the meetings concerning the change to the process, to discuss the fact that there may have been routines in the past which should be continued and which should be taken into consideration in the next steps –it's certainly "not all bad". Appreciation and recognition of the positive elements is indispensable. Only a nuanced discussion of the past establishes a high level of trust and credibility.

The development of a concept for the change architecture which initially determines the sensitivities with regard to the affected employees' personal perceptions in multiple stages is helpful for the change process. This can be done in various formats (workshops, small group discussions, individual meetings with a neutral "person of trust"). The experiences must be analysed and implemented in a solution-oriented action plan so that it is clear in which form which concerns and needs can be handled.

Communication

Appropriate communication, which should be considered in advance and outlined, is a key

part of establishing the necessary acceptance.

Several key questions which provide clarity with regard to what is really important are suitable for the development of a communication concept:

- What key messages do we have for the project?
- How do we communicate with whom, when, and about what?
- What channels are used for communication?
- How do we ensure that everyone understands the same thing and
- all employees are always on the same footing?

From experience, you should never assume that everyone is well informed and everyone has the same understanding!

The need for communication is often significantly underestimated, particularly in technical fields.

Quality assurance

In order to be able to ensure the sustainability of the change and safeguard the potential which is expected from the design idea in the long term, a quality assurance concept must be developed. The following basic questions should be discussed here:

- What is shared understanding of values and how can it be established?
- How is the knowledge applied and documented?
- How do we ensure that everyone involved starts at the same time and is able to get started?
- How do we work in the new roles and prevent "shadow worlds" from remaining?

- How is the controlling process done? When will the success be determined?
- How do I motivate employees to contribute creative improvements? (Continuous improvement process) Examination of these questions is an ongoing management task.

Work instruction

In order to guarantee the self-perception set out above, it is necessary to determine how the parties involved should work with the new system (rules of play). The following should be determined in detail:

- Whom does it concern?
- How should data be handled?
- What tasks, permissions, and obligations do administrators and user groups have?

The author's personal experience

When implementing a project with this sort of scope, it is essential that the managers address the content personally and credibly, and discuss it or work through it together with the people involved.

It is important that the employee experiences appreciation for their performance and that both the seriousness of the change and the certainty that their worries will be taken on board and deal with are made clear to them.

It should be ensured that many employees are happy to take on more responsibility. It is therefore necessary, on the one hand, for an appropriate error

culture to exist or be implemented in which it is possible for the employees to be able to “make a mistake once in a while”. On the other hand, employees also require orientation in this change process in the sense of a jointly developed self-perception (role clarity) as well as in the form of rules such as work instructions or process descriptions. This also includes identifying potential risks at the necessary points and setting out a procedure for dealing with them (integrated control system).

At Leipziger Verkehrsbetriebe, it was only a year from the awarding of the contract to the complete “activation” of the system. This is a very short period of time for a big challenge. However, it should be noted that at

least 80% of the objective of implementing the system with implementation of all requirements and training the employees in the independent use of the system has been achieved. In accordance with the Pareto principle, it should be assumed that the last 20% will also take a significant amount of time; ultimately we are working with people.

Conclusion

By now, digitalisation is offering chances and opportunities for managing and developing fixed assets in a highly professional manner. Migration from the analogue or semi-digital world to the fully digital world offers significant potential for increasing efficiency as well as improving

quality. Here, it is essential that this step is taken with the greatest care. This care must certainly apply to the choice of a suitable system and the technical implementation. Particular care must be taken to ensure that there is intensive guidance for the substantial change process which results from this. Change management must be more than just a management buzzword here, it must be filled with content and life. The employees and their motivation are the mainstay for success, even in a digital system. Failed implementation cannot generally be remedied. The associated cost in terms of time and money is too high not to also invest the necessary energy here

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