FNT

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IT INFRASTRUCTURE MANAGEMENT IN THE AUTOMOTIVE AND MANUFACTURING INDUSTRIES

CASE STUDIES AND BEST PRACTICES

IN THIS WHITE PAPER

Full transparency into IT infrastructure is the starting point for ongoing and successful transformation. Automotive manufacturers and industrial companies need a stable foundation to address current market challenges around change, realignment, and consolidation. In terms of IT, this means that documentation of requirements, IT assets, and their dependencies must be standardized, with the process being largely automated and seamlessly integrated into the IT value chain. In this white paper, we present concrete use cases to show what a future-proof solution for documentation and management of IT assets in manufacturing industry can achieve across the entire lifecycle.

CONTENTS

Best Practices for Future-Proof IT Infrastructure Management

STANDARDIZE, DOCUMENT, BENEFIT

The Internet of Things (IoT) and Industry 4.0 are driving digital transformation within the manufacturing industry. Billions of sensors, terabytes of data, and the introduction of artificial intelligence are all ramping up performance expectations on IT infrastructure. In industrial settings, there is also a need to integrate many disparate and distributed IT instances within the value chain. This should preferably be done in a customer-focused manner and sooner rather than later.

Industrial companies can find the perfect solution by seeking inspiration from their production processes. After all, businesses in the automotive sector already have ample experience with modular systems and complex supply chains. They can now leverage that knowledge. Silos and islands have no place on today's factory floor – every IT segment needs to be integrated into the information chain. This applies to client systems and digital production facilities as well as the network, with its active and passive components, such as storage and servers. Virtualized services – both on-premises and in the cloud – also need to be included.

The automotive sector has recognized this trend and has made the seamless documentation of IT resources a priority. The industry's heavyweights are taking the lead and boosting process automation to maximize efficiency. This is not primarily about the availability of resources. Rather, businesses have recognized that standardization, unified components, and digital twins all help to reduce complexity – an objective that is becoming even more important with increasingly hybrid infrastructures. This often goes hand in hand with the reorganization of production and a strategy of offering many different options through modularization. The same approach can also work for internal IT departments.

IT AS A CENTRAL MANAGEMENT FUNCTION

An additional bonus of continuously updated, integrated documentation is that enterprise IT is better placed to handle future challenges. Companies will gain the crucial ability to understand all the relationships between services and the supplier units: What contractual dependencies are there within services? How are costs and risk balanced? How do we deal with internal customers? IT is responsible for managing the supply chain for its infrastructure. Efficient "production" and management of IT, including fast adaptation, can only be achieved if comprehensive documentation of the individual assets and all the dependencies between those assets is in place.

TRANSPARENCY, PLANNABILITY, AND SPEED

In this white paper, we present a variety of case studies that show how global players from the automotive and manufacturing industry are using FNT solutions for IT infrastructure management. These companies all have distinct IT strategies and different functional priorities. For some, the focus is on servers and the associated tools, for others the key issue is documentation of networks, and still others need to record and manage all their IT assets. However, all these organizations face the same challenges. Transparency, plannability, and agility are essential to meet the rising demands of both internal and external customers now and in the future.

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THE KEY REQUIREMENTS FOR EFFECTIVE IT INFRASTRUCTURE MANAGEMENT

- **Transparency**
  Documenting all IT components in a central data model makes it possible to capture the complete environment, to make changes, and to implement IT infrastructure requirements more easily.

- **Single point of truth**
  Having a comprehensive overview of all areas of IT infrastructure and centralized information allows holistic reporting and insights and also improves plannability.

- **Efficiency**
  An extensive library and planning functionalities that cover everything from data sockets through cables, networks, and storage to servers enable more efficient IT processes.

- **Costs/time**
  IT infrastructure management tools are only effective if they are integrated, since this allows the costs of individual tasks and IT processes to be optimized.

- **Services**
  Customer satisfaction is increased by better IT infrastructure performance, faster provisioning, reliable implementation of service-related changes, and shorter downtimes.

Case Study: IT Infrastructure Management on Demand

DATA HIGHWAY INSTEAD OF FUNCTIONAL ONE-WAY STREETS

One tool, many options. For a global player within the manufacturing industry, the IT infrastructure management platform has become an enterprise-wide standard over the years. Deployment spread from a group subsidiary through international locations to headquarters, with different functional requirements in each case.

Many companies in the automotive and manufacturing sector face the challenge of losing expertise as long-serving employees retire, especially in IT departments. This affects not only in-depth knowledge of legacy applications, but also IT assets and cabling within the organization. A global manufacturing company was faced with this challenge when an IT specialist at one of its production sites retired. To ensure that his insights into the cabling between buildings on the campus at this location could be captured in an IT solution in a structured way for future use, the company opted to use a documentation tool. Thanks to the tool's modular structure, it was also possible to include another of the group's production sites, where all active network components needed to be recorded and documented. As a result, what started as a proof-of-concept exercise evolved over six years into a multi-location platform for IT infrastructure management.

FROM CABLES TO COMPLETE DATA CENTERS

The solution was gradually rolled out to more and more locations and departments, including a factory in Italy, to document the IT backbone and active network components. The initial requirement in Italy was to document the components that make up the fiber backbone. After a successful implementation, the scope of the project was widened to cover networks and IT hardware as well. All of the company's data centers in Germany are now comprehensively documented in the solution, while the international data centers use the tool for their backbones and active network components.

CAPACITIES AND RESOURCES AT THE TOUCH OF A BUTTON

The standardized data platform enables IT management to access relevant information at the click of a mouse, anywhere, anytime. Accordingly, each international rollout project included a phase in which data relating to existing systems was captured, standardized, and merged. The group can now not only respond faster to faults, but also plan better. Instead of having to search for free ports on site, all capacities and resources are documented in the system. The Excel lists traditionally used are unable to show dependencies and do not allow causality tests. All of this is now possible, which further enhances operational efficiency.

MODULAR SOLUTION KEEPS UP WITH GROWTH

The iterative approach also highlighted another advantage of a modular solution with a standardized database: new tasks no longer lead to a functional dead end where you have to start over. Today, companies are opting for a use-case-oriented solution that can be adapted and expanded as required, with functionality being aligned with requirements. Existing organizational or structural silos – networking, storage, data center, facilities (power & cooling) – can all be integrated smoothly into the standardized data model. Furthermore, scalability means that central IT management ultimately needs fewer resources.

BENEFITS FOR THE CORPORATE GROUP

- ✓ Documentation at the touch of a button
- ✓ Fast response to faults
- ✓ Scalable from cabling to DC management
- ✓ Logical and transparent licensing model
- ✓ Modular instead of monolithic
- ✓ Out-of-the-box data model
- ✓ Efficient integration into IT landscape
- ✓ Flexible roles and mandators

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Case Study: Flexible Standards Deliver Success

PLAYING IT SAFE

A corporate group, dozens of subsidiaries, and a variety of use cases. Adopting a central solution for documenting and managing its IT assets allowed an automotive group to achieve multiple objectives. The key issues were efficiency, speed, and improved quality in IT resource provision – plus the answer to the seemingly trivial question of finding the best place for a new server.

IT asset management supports everything from individual tasks to the big picture. More than 50 mandators and more than 1,700 active users from various sectors currently deploy the solution worldwide and access the data pool. The focus is on the IT hardware in the backbone, i.e., servers, data distribution cabinets, storage systems, and switches. To enable these systems to function as a coherent whole, the solution captures data on spaces, power consumption and availability, weight, air conditioning, IP networks, virtual servers, operating systems, and applications. Even faceplates are given a number in the system, as well as PDU power rails, of course, so that managers know which applications will be affected when RCCBs are tested.

FOCUS ON IT HARDWARE IN THE BACKBONE

Management of IT hardware in the backbone is the core requirement, with the aim of establishing a controlled change process. All physical devices, such as servers, storage, and switches, are planned and approved using the solution and allocated via the workflow function to the service providers or suppliers responsible for installing the systems. At the main plant, around 25 experts work on planning alone. When the service provider has carried out the required activity on site and provided confirmation in the workflow, the planning information held in the system is used to update the actual status. The downstream team responsible for acceptance and commissioning then takes over, with the data generated likewise flowing into the documentation.

15 INTERFACES FEED THE SOLUTION

A range of operational data is maintained on each physical server, including serial number, inventory number, cost center, contact person, planner, end customer, and administrator. Every console access for remote maintenance, IP addresses, and IP networks are also documented, together with the supported business and technical services. An additional level covers virtual servers and storage, with the relevant data being imported into the platform overnight. Information from a total of more than 15 interfaces flows into the solution – creating a shared platform that enables exchange between all systems.

INTEGRATION WITH OTHER TOOLS IS ESSENTIAL

The ability to integrate the solution into the management tool landscape is crucial. For example, information from a third-party tool on virtual servers and their operating systems can be used to compare the ideal state with the actual state: How much RAM was planned, what did the software discover? Some special discovery tools can only investigate devices that are active and using power, so they cannot provide information on rack units in the switch cabinet or manufacturer details. This data is aggregated in the solution so it can be passed on to the IT service desk. If changes or incidents occur, the location, rack, rack unit, and slot housing the defective components – network card, hard disk, or power supply unit – can be identified immediately. IT managers can also see which applications are affected by the incident.

SUPPLIER MANAGEMENT AT THE TOUCH OF A BUTTON

Consolidated information enables the company to manage its suppliers effectively. Work orders for installers are generated in the system, with billing also being based on the documentation in the platform. Reviewing this data shows which companies work quickly and do a great job, what process time trends look like, and how satisfied the acceptance teams are. Were the screws tightened properly in accordance with the required quality standards, for example? The solution also gives every IT device, including fixed and patch cables, its own ID. The label is printed by the installers on site using a standardized nomenclature – with uniqueness guaranteed worldwide. This information is also passed back to the IT management tools and the service desk.

POWER SUPPLY WITH BUSBARS

Active network components include not only servers, storage, and switches, but also PDU rails for providing them with power. These rails require relatively frequent maintenance, e.g., to test RCCB switches. Before a rail is powered down, the IT managers and product owners affected receive a calendar entry providing information on which servers will be unavailable and when. This makes it possible to switch over to redundant PDU rails to maintain the power supply to critical systems.

SEAMLESS COVERAGE FROM NETWORK NODES TO DATA SOCKETS

Tray management extends the range of assets documented from active network components to nodes, trays, segments, and cables in floor sockets. This involves indoor and/or outdoor assets, depending on the site, with it also being possible to calculate the length of cable runs, which is always important for construction and modification work. Information is also stored on which data sockets are patched. The background here is that the company does not fully utilize all switches and not every network connection is actually connected. The signal paths are documented from the switch via the patch panel to the data socket, as well as the associated client computer. If an employee needs to relocate, their old data socket will be deactivated and swapped to the new location, giving the employee network access again.

WHERE IS THE BEST PLACE FOR A NEW SERVER?

IP management forms the basis for connecting, provisioning, and managing servers. All network information, including office buildings, production, security, intranet, extranet, and B2B aspects, is held in the platform's IP management system. In data centers, it also documents spaces, power ports, networks, air conditioning, weight, and faceplates, making it possible to instantly identify the best place for a new server.

Missing documentation creates a host of disadvantages – hotspots develop, the power network is overloaded, there are bottlenecks in data connections, route optimization for technical teams is affected, PUE values deteriorate, and green IT targets are missed.

The benefits of meticulous documentation are clear, with server deployment being faster and more efficient. Instead of taking several weeks as in the past, physical devices can be ready for use in just days. In handling its IT infrastructure management value chain, the automotive group is guided by the modular principle that defines vehicle-making operations. The aim is to have standardized "server components" (physical and virtual) in a documented environment, with the same parameters, that can be deployed quickly and are also easy to manage.

Case Study: Workplace-Management of the Future

UNIFORM DOCUMENTATION WORLDWIDE

With or without a pandemic, comprehensive documentation of client hardware facilitates planning and accelerates transformation. This automotive supplier is standardizing its IT end devices across all sites worldwide and has gradually extended its asset lifecycle management to include production.

Hose clamps, couplings, and connection technology for fluid systems are among the many technical components that are typically hidden away. Their importance only becomes apparent when they fail and warning lights start flashing because the flow of fuel, coolant, or lubricant has been interrupted. The same applies to the IT end devices used by this hidden champion, which has been systematically and seamlessly documenting its IT clients for some ten years. All workplace information on laptops, desktops, VoIP phones, and printers from around 80 locations in Asia, America, and Europe can be accessed and used at the touch of a button. The information captured and its streams form a reliable basis for planning and implementing structural as well as minor changes in the IT workplace, e.g., switching from the office to working from home due to COVID-19.

NO UNCONTROLLED GROWTH IN ASSET MANAGEMENT

In addition to gaining a fast overview of the IT landscape, one of the central goals for this supplier is to standardize its client systems and manage them more efficiently. Hence the requirement that in the event of an acquisition the new site should be added to the solution immediately and all asset information copied from the existing tools. The company is determined to prevent uncontrolled growth and ad hoc solutions. To support this goal, the IT department uses asset lifecycle management to identify devices whose support will end in the coming year and thus need to be replaced. Assets are documented throughout the entire lifecycle, from planning to decommissioning and scrapping. Detailed analyses and reports make decision-making easier.

Importantly, every change to a configuration item with regard to location, attributes, and links can be logged. It is also possible to record external events, such as incidents, changes, or system states from network management. The automotive supplier has almost completely automated data imports. The data flows via an interface to a digital workspace management tool into the FNT Command Platform, where the entire location structure can be viewed, right down to buildings, floors, and rooms.

FROM WORKPLACE TO INFRASTRUCTURE MANAGEMENT

Many other interfaces are also possible, e.g., to vCenter Server Management, network management, other FNT solutions, and third-party applications. Documentation now extends beyond pure client hardware and workplace management to include network infrastructure and key software components, such as the operating systems, MS SQL server, and office software, thus allowing holistic IT infrastructure management. Expansion of asset management beyond business IT is planned for the future. Information on IT assets will then flow seamlessly from all instances within the company – wherever staff may be working.

Workplace assets in figures

Around **80** locations worldwide

More than **1,000** rooms

12,500 end devices in total

4,000 IT workstations

6,000 active network components

400 physical servers

1,500 virtual servers

200 storage systems

350 switch cabinets

IT asset and configuration management

- Integrated view of all assets and CIs over the entire service lifecycle, from planning to decommissioning, including historization.
- Functional support to identify, control, and monitor IT assets and CIs.
- The entire infrastructure (hardware, software, licenses, contracts, documents) is captured.
- All logical and physical CI relationships are shown in their current and planned states.
- Easy integration into existing IT environments and information platforms for all relevant ITIL processes (e.g., incident, problem, and change management).
- Integrated workflow, e.g., automated job management.

Interview: It's Not a Never-Ending Task

IT INFRASTRUCTURE MANAGEMENT FROM IP ADDRESS TO IT SERVICE

Even prior to the COVID-19 pandemic, the automotive industry was under intense pressure to change. Value chains need to become more digital, more flexible, and more efficient – just as IT assets must be organized. Wolfgang Schaupp, head of DACH sales at FNT, and Stefan Klein, account manager for the automotive sector, talk about centralized documentation of IT assets and its relevance for implementing end-to-end services.

Mr. Schaupp, industrialization of IT has been one of the big visions for a number of years now. Compared with car making as a pioneer, how does IT in the manufacturing industry measure up at the moment?

Wolfgang Schaupp: IT and manufacturing have one key thing in common: the apparent aim is to record infrastructure components, but the focus is actually on delivering products and services. Ideally, this always happens based on specified standards: the same content, the same times, the same quality, the same costs. Industry has thus long been striving to reuse components and thus make production more efficient. Many IT departments now also subscribe to this vision, along with various software manufacturers. All of them want to mix and match modules in order to create and provide a range of different services.

Stefan Klein: Today, this strategy is being applied more or less consistently in production settings. The ultimate aim is to integrate all service providers and suppliers to create a comprehensive, end-to-end process. This process can then be managed, controlled, and optimized as required.

In principle, this approach can also be applied to IT departments, e.g., with regard to demand management, procurement, delivery, and control.

Klein: Exactly. Over the last few decades, many IT organizations have set themselves the goal of building highly professional, efficient relationships with their suppliers. To ensure that the value chain runs smoothly, all the suppliers involved need to be integrated into the process. Without the right tools, component standardization, and process acceleration, even a modern "manufacturer" of IT services would face the challenge of relatively unresponsive suppliers.

Schaupp: No matter whether you're a client or a supplier, it's all about the end-to-end process. First come the supplier interfaces, making it possible to manage suppliers via workflows, then orchestration, and ultimately automation. Given the level and complexity of large-scale IT landscapes, it's no longer possible to organize everything manually and individually, that would be a never-ending task.

IT organization on industrial principles is not a new concept. Why has it taken so long to become established?

- **Schaupp:** A number of challenges needed to be overcome along the way, with the starting point always being comprehensive, centralized documentation of IT assets. However, the introduction of a configuration management database (CMDB), orchestration of data sets, and development of interfaces don't happen overnight. A major OEM typically has between 50 and 75 interfaces to its CMDB. End-to-end processes span an entire data value chain, from product design through delivery to service go-live. All that had to be implemented alongside creating the necessary conditions within organizations, restructuring, and personnel changes. So it's not surprising that industrialization of IT is taking so long.

- **Klein:** And don't forget that the tools and technologies had to undergo significant development. Today, the cloud offers the ideal opportunity to store data centrally, where many instances can access it. The range of functions continues to grow and expand. This increases the level of integration, but also means greater complexity. In that respect, we will repeatedly have to adapt existing environments to meet new requirements.

- **Schaupp:** At least we've left the millennial silo approach behind. The private sector, such as the big e-commerce providers with their one-stop shopping service, highlighted what IT organizations had to do. I can go to a portal, find the information I need, and press a button – that now also works for ordering a workstation or a virtual server. However, someone has to conduct the orchestra to keep it in harmony.

So what is the current state of play in the automotive and manufacturing industry in this respect?

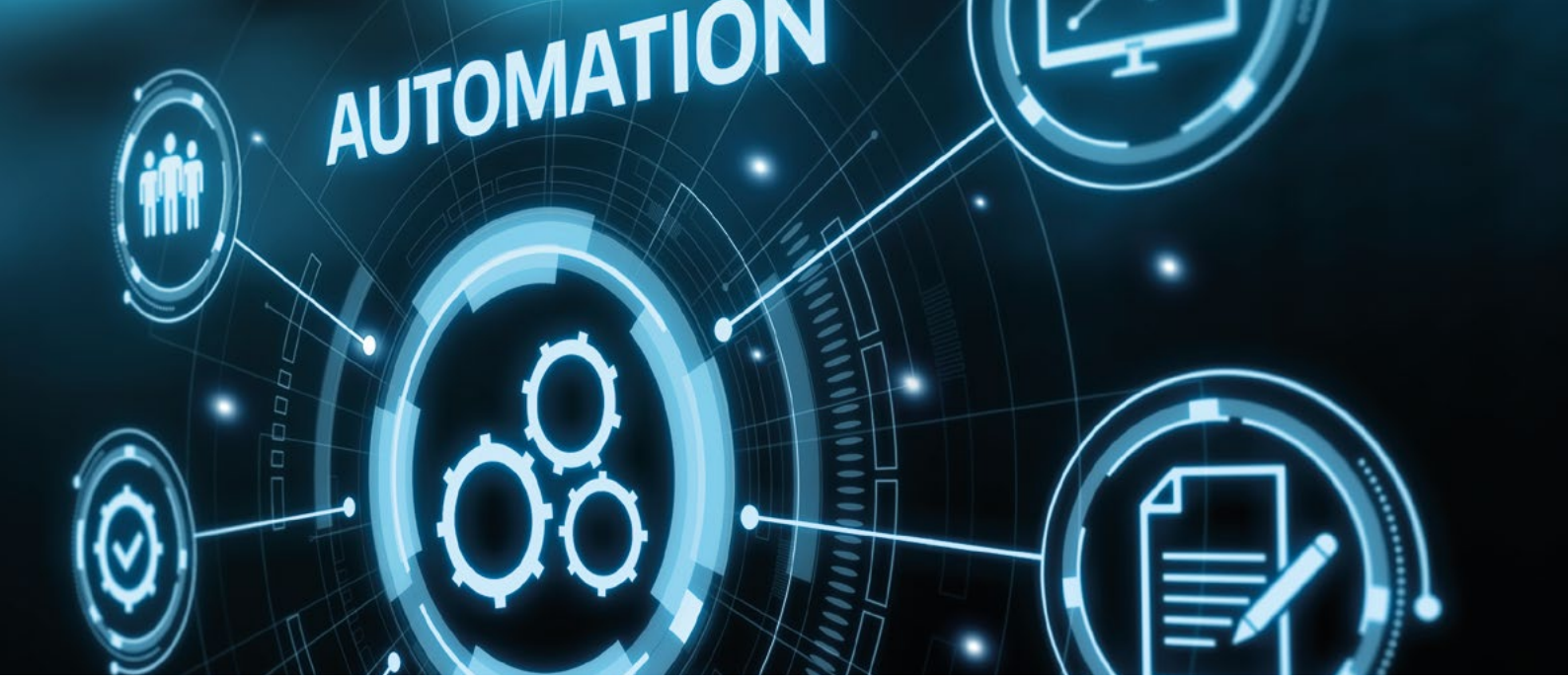
- **Klein:** It's a very mixed picture, some companies have made more progress than others. It partly depends on whether they can shape the end-to-end chain or just have to accept the existing constraints. Large SMEs, for example, leverage their automation potential to the full out of pure self-interest, because they act as both client and supplier in value chains.

There are at least two perspectives in end-to-end processes – the configuration item view and the service request view. Which perspective do you recommend, and why?

- **Schaupp:** We come from the infrastructure side. Businesses have to combine core infrastructure components, such as servers, storage, clients, network components, and cables, to create attractive products. At the end of that process, the product manager can use all the information to design a service that the customer requests and consumes. But if I take a top-down approach, i.e., develop the services first, I don't have the consolidated data basis and interfaces required for automation. In that case, I have great products, but I don't achieve any time and cost benefits in production and operation.

- **Klein:** Documentation of IT assets in one way or another is now a given. All businesses do it, but most don't use integrated smart solutions. This makes it impossible to cover the entire value chain and work productively. Every large IT department needs an assembly line for its services to reduce personnel effort.

- **Schaupp:** Creating centralized links between data islands adds a lot of value. It's not just about individual data points, but also the relationships between components: Which application is running on which server in which rack? Our rule of thumb is that IT assets make up 20 percent of service design, while their relationships account for 80 percent. Knowing the relationships makes it possible to design, deliver, and operate future-proof services. Transparency is essential for IT and car making alike.



Case Study: From Server to Application

A PLATFORM FOR IT AUTOMATION

Premium automobiles need premium IT. This German company is making comprehensive documentation of its IT environment in a CMDB a priority to help it drive automation. FNT's solutions fit efficiently into the IT landscape and serve as a data hub that meets the specific use case.

Servers, network components, clients, and applications – over the course of several years, this premium German automobile manufacturer worked hard to transform its cable management system into a CMDB that is used to manage all IT operating resources. Around 2,000 company employees now access the centrally stored data. The key functions provided by the solution are an overview of network and IT equipment configuration and high-performance interfaces. The latter are especially critical for long-term deployment of management tools and in complex environments. Most information is now provided via interfaces, rather than being entered manually. Around 20 interfaces based on a variety of technologies supply data to the solution, while some 80 interfaces access that data for use in various services and applications.

Today, the platform provides IT infrastructure management with all the relevant information for problem, incident, and change management processes. Alongside the names of the people responsible for each CI, it also records relationships: Which application is affected if a server component needs to be swapped out? Knowing the dependencies between the IT levels makes it possible to proactively inform IT application owners about planned maintenance windows. Similarly, in the event of an incident, object IDs enable IT managers to identify the cause of a fault and the impact. This is especially relevant for critical incidents in primary value creation processes, for example.

IP management has always been a central part of the solution. Since enterprise IT is a headquarters function, all devices around the world, from computers to robots, are allocated their IP addresses by the FNT Command Platform. Identifiers, host names, network domains, and addresses are documented here and then assigned to the group's DNS servers via an interface. The solution thus also impacts the production process – if a wrong IP address is deleted, production may be directly affected.

Over the next few years, the established platform will also be used to drive automation of IT processes. This marks the continuation of a longstanding relationship. The overall solution was developed in close partnership and has grown through joint projects and new requirements to meet the latest benchmark standards for the automotive and manufacturing industry.

SIX BENEFITS OF A CENTRALIZED INFRASTRUCTURE AND ASSET PLATFORM

- **Complete transparency** into all IT and network components.
- **Monitoring of dependencies** from cable to business service.
- **Reduced operating costs** thanks to shorter IT processes.
- **Greater efficiency** due to easy integration into existing processes.
- **Better change planning** based on transparent information chains.
- **Future-proof and flexible** thanks to continuous development and APIs.

Summary: Documenting IT Assets Centrally – Building Bridges

To deliver stability, speed, and efficiency, IT departments need a comprehensive overview of their IT infrastructure, tight data connectivity, and end-to-end processes that are automated or capable of future automation. This level of insight and control is essential for fast and reliable planning, management, and fault resolution. The key issue is how to bring together comprehensive documentation of IT assets and their dependencies and configurations in one central location as efficiently as possible. Typically, a configuration management database (CMDB) forms the basis for such documentation tools.

To get started, the IT asset management tool can be populated with data via an auto-discovery tool, for example. For offline devices and cables, the effort involved in taking an inventory can be drastically reduced and the process accelerated by using mobile devices. Intelligent, automatically generated ID labeling combined with barcode scanning, RFID tagging, and the use of intelligent patch panels, for example, can help to keep data efficiently updated after the initial inventory.

The documentation tool also needs to have a large number of standardized interfaces and it should be possible to adapt the interfaces yourself where necessary. This allows data to be continuously imported from existing management tools and returned. Interfaces to traditional service management tools are also highly valuable. They enable service processes, such as a helpdesk and the associated incident processes, to receive all the information they need for smooth operation.

Read more:
More information can be found in our white paper on **IT Infrastructure Management 2021.**

Download for free now

SUCCESS FACTORS FOR IT DOCUMENTATION

- Comprehensive – shows all assets and their dependencies
- Selective – ability to define relevant data sets
- Automatic – integrates data from auto-discovery and network scanning
- Open – interfaces are standardized, yet adaptable
- Universal – covers physical and logical components
- Out of the box – proven data model with templates
- Modern – supports many additional functions with advanced CMDBs (3D visualization, planning functionalities, process integration, automation)

OUR RECOMMENDATION

Organizations should keep the effort associated with initial population of the central IT asset management system as low as possible. Decisions must therefore be made as to which data has commercial priority and should be tackled first. Experience has shown that "big bang" implementations aimed at capturing all the relevant information frequently fail, while a phased approach allows businesses to start using the tool productively significantly sooner.

The support of the software manufacturer during implementation is likewise beneficial – their experience across a variety of markets and use cases dramatically accelerates rollout and reduces the burden on internal IT teams. In all cases, the aim should be to automate data flows. This reduces error rates, manual effort, and process times.

About FNT

FNT GmbH, headquartered in Ellwangen (Jagst), Germany, simplifies the management of highly complex digital infrastructures in companies and public authorities with its FNT Command Platform. With the cloud-enabled "software made in Germany", IT, telecommunications and data center infrastructures can be efficiently recorded as digital twins and documented across all levels from buildings to digital services. The software also offers open interfaces and numerous functions for planning, implementing and automating transformations and changes in an integrated manner. FNT's customers include more than 500 companies and government agencies worldwide, including more than half of the DAX-40 listed corporations. FNT operates offices in several locations in Germany as well as in New York, London, Singapore and Timisoara and has an international partner system with market-leading IT service providers and system integrators.

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