iFD– Retrofitting using cloud services

A quick poll of logistics today questioned the atmospheric picture of the most important topics of intra logistics. Availability, digital transformation, flexible automation and modernization are the most important topics at the time.

How is a company able to achieve digital transformation and flexible automation with a system built under outdated functional aspects, which has been in use for 10 or 20 years?

Requirements like adaptable delivery times, traceability of goods and transparency in processes are often insufficient.

A modern system is fundamental for a flexible automation. A future-oriented system is the backbone of digital transformation and an ongoing task in times of high technological dynamics.

The renewal of measuring techniques, control and drive technologies plays a major role in retrofit projects, whereas mechanical components like conveyors and stacker cranes can be used for up to 15 to 20 years. Technical disruptions, lack of efficiency and insufficient system flexibility often precede any optimization projects. Due to the declining system availability mainly caused by malfunctions, the maintenance intervals are reduced, which inevitably leads to higher maintenance costs.

The shortage of suitable spare parts and lack of competence in terms of maintenance increase the desire to modernise. The list of reasons for modernisation can be continued endlessly, aspects of plant safety, legal requirements or ergonomic inadequacies force plant operators to improve their systems. But the main triggers are probably the unachievable future performance targets. Missing routing and supply strategies result in technical systems slowing down.

Frequently, retrofit projects get validated against redesigning. Existing installations are continued to be operated, since amortization costs for modernization are significantly lower. Due to the system update, the first savings are already noticeable after reducing the service costs. Retrofitting also extends to conversion, upgrading and exchanging, so that sometimes strongly modified facilities are created. However, not every project needs to lash out in all directions, since individual examinations show the appropriate procedure. Depending on the facility, an adjustment of the IT, redesigning individual sections or the extension of the plant could be possible options. All in all, retrofits are target-oriented steps to achieve efficient and high-performance sequences in your plant.

Conducting a Fit-Gap-Analysis should be the first step in the initial phase of a modernization project. The main reason for such an analysis is to locate any components that don't meet the given requirements, to further development a model on how to proceed.

By customizing the software, a higher flexibility can be reached and any adjustments after go-live contribute to an increased efficiency.

What is the approach for a modernization project?

With the help of a detailed documentation and read-out of data via different interfaces, the plant will be tested during operation. Current and potential risks will be calculated and then arranged in a risk matrix. Temporary measures and workarounds can be vital to maintaining regular operation during the project duration. Every electronic and mechanical component, as well as the existing IT concept and data management will be reviewed and tested against future requirements. After the completion of any preliminary considerations the plant operator will receive a system for simulations and tests. Once the testing period for hardware and software is concluded, the conversion of the facility will take place. When carrying out migration projects, a run-up in gradual phases during non-operating times has proven to be successful.

How to manage the application from the cloud?

Benefits of deploying the application in the cloud:
- On-demand self-service
- Broad network access
- Resource pooling
- Rapid elasticity
- Measure services for monitoring resource usage

The "Software as a Service" (SaaS) cloud solution is suitable for use in automatic systems. SaaS applications use the providers cloud infrastructure and therefore are available for different clients. Moreover, the SaaS solution is to be understood as program interface.

Technical implementation

The plant will remain in its actual surrounding, since technical components exist on-site, and valuable systems are included into the cloud. A control system for completing transactions is vital in highly available facilities. The logics and main processing of your system will be transferred into the cloud, while the data-processing will take place locally with the help of a data concentrator. Main requirement for the implementation is an internet connection. Real-time communication is accessible using another cloud service.

Low-bandwidth and high latency lines are suitable for exchange, because the interchange of control impulses can be compared to a compression algorithm.

How to make use of it?

- Enable global use of the application and networking
- Flexibility: cloud services allow to shift away from IT investments. Preliminary services and initial investment are practically zero. Only services that are in effective use will be paid for.
- Technology pioneering: cloud services help with customer acquisition and the provision of new services. This information will generate added value to clients outside of the company. The core aspects here are availability and processing states.
- Safety in processes and data security: an important and often addressed topic. Data security of the cloud service is identical to on-premise solutions. Facility and process data will not be available externally, since encryption and the use of basic IT security principles will prevent any access.

Are there other features or advantages of cloud computing?

The use of hardware is dynamically optimized so that users can easily access content from basically anywhere, if you have internet access. Therefore, it is scalable in both directions in only a short period of time. Companies increase their flexibility, since cloud services can be adjusted to any usage behaviour, even if exact numbers are difficult to calculate. Fixed investment costs and risks turn to variable expenses which are based on the effective requirements.

Are there any disadvantages of cloud solutions?

The most important criteria for costumers are safe encryption of data, availability and efficient, as well as smooth program flow. Meeting the requirements in the highest quality possible is crucial for establishing cloud systems in the sector for automated intralogistics. However, potential costumers or users recognize the missing individualisation and customization as problematic areas. Cloud services are typically aimed at standardisation, which is often not the case with individualized technical facilities.

Summary

A standardized, updated, consolidated application deployed from a cloud allows for a simplified and accelerated launch of the newest services and products, thus creating a competitive advantage. Therefore, the focus lies on the core business which leads to improvement in quality as well as increased opportunities for both competition and growth.