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Assembly line instead of job-shop production - run SAP like a factory

Toyota Production System was the driving force: how a machine builder industrializes the application management and maintenance of its SAP core software across multiple time zones.

As a machine builder, Mettler Toledo knows what industrialization means: pulsed flow production in line with the zero-error principle. The Swiss company has been enjoying success with this vision of "synchronized, evened, trouble-free and highly automated" production in the areas of medicine research, development of active ingredients and the packaging industry for a long time. It is the world's largest manufacturer of industrial weighing systems, covering the entire range of a tenth of a microgram to 1,000 tons. The IT system is as international as the customer base. In line with the "follow-the-sun-principle", the IT system is not only operated on beautiful Greifensee in Switzerland, but also in the United States as well as offshore centers in India and China. An international service provider there takes on some configuration, development and operational tasks.
The goal of an SAP re-engineering project was, so to speak, "squaring the circle": meeting the increased business requirements with better time-to-market at lower cost.

It quickly became clear to the IT management of Mettler Toledo that you can't get by with known IT methods such as Agile / Scrum alone and you have to think outside the "IT box".

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They ran across the Toyota Production System, or TPS, which has its roots in the 40s, when the shortage of raw materials in Japan became a major problem. TPS gained international attention and became a model for U.S. and European motorists when Taiichi Ohno, the formative production chief of the post-war period, published its main features in 1978.

But only when James P. Womack and his 1991 book based on an MIT study, "'The Machine That Changed the World", did the term 'lean production' become known throughout the world - increasingly also beyond the automotive industry and production sector. In the context of "lean thinking", the lean philosophy has enjoyed great popularity in the last two decades: since then, the 7 types of waste (in good Japanese "muda") have been examined as extensively in administration (keyword: lean administration) as in the R & D sector (keyword: lean engineering). Only the IT sector seemed unimpressed to date, at least until Mettler Toledo adopted the transformation of the lean concept in SAP management.

The aim was to ensure better line balancing of SAP customizing and development resources across multiple time zones. A largely automated workflow should reduce overhead costs, which, according to Fraunhofer IPA, account for up to 30% of administrative costs. In contrast to the so-called push-principle, a "pull-production principle" is based on the idea that a requester "automatically" pulls the the next sub-contract behind him/her. In the interest of kanban logic, this means that a "completely developed SAP change request" is pulled by a "tester" (i.e., the tester decides when he/she wants to have the underlying transports in his/her test environment), and a change request therefore moves through the entire development workflow in the
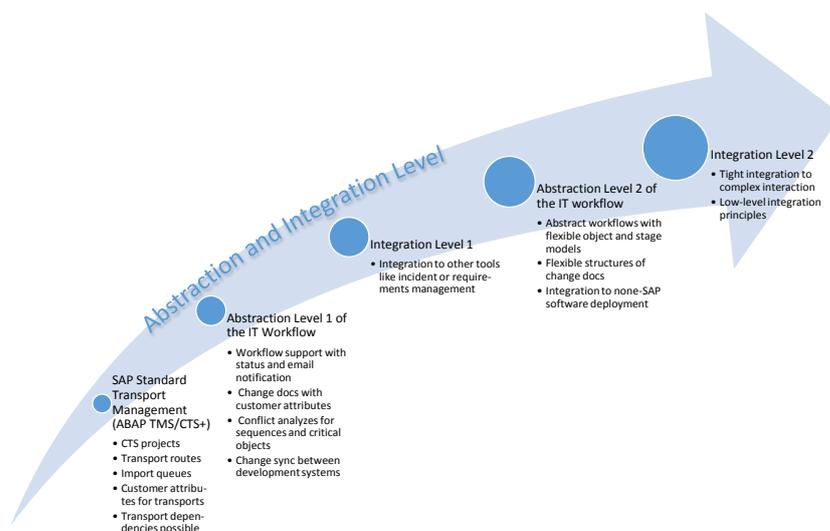
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SAP factory without "turbulence in production", as it is called in lean management. Without the "Hey Joe" effect and Excel lists with media breaks.

After this conceptual line of approach was defined, an international strategy consulting firm was commissioned to define appropriate processes in line with 'lean management' aspects and to search for a "suitable plant engineer" for the "SAP factory". During a twelve-month process, the required criteria were defined in detail and the selection was made:

That is, a search was done for a standard software that can cover the entire industrial value chain of the SAP assembly line in an environment evened over multiple time zones.

The previous landscape consisted of a service desk and the SAP solution manager, ChaRM and TMS standard tools. The entire workflow was realized via elaborate manual solutions with many media breaks.

In the course of evaluation, the various vendors divided up into 5 categories according to the maturity level of industrialization concerning the SAP factory (see graph below):

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Based on this maturity model, the following evaluation results were obtained:

Production in the customer cycle	
The previous system was based on many manual work-flow steps with manual checks.	With Conigma Suite, the following change occurred: automated and revision-secure pull-principle via status definition and 'task lists' for the respective role (developers, testers, etc.).
Elimination of wastage	
Example regarding SAP transports: Manual transport procedures (require several "stand-by teams" across different time zones).	Example regarding SAP transports: Automated transports for ECC, CRM, HCM across all time zones and system lines.
Synchronization of processes	
Challenges of the previous solution: The SAP systems went "out-of-sync" due to non-implemented changes and the difficulty of monitoring these. Therefore, time-consuming clean-ups were required.	With the new solution, each transport is assigned to a ticket in Conigma. Thus, each change is compliant in the system. There is also workflow support for dismantling of non-deployed changes.
Standardization of processes	
Due to a lack of clear and unique standardization, mis-leading ticket statuses occurred in the past.	With the use of Conigma, the introduction of a clearly defined workflow went hand-in-hand with phase-based

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| System-generated statuses represented different "functional statuses", which led to a low acceptance of the system.	statuses, which represented a unique state and role-dependant work order for each member of the SAP IT-staff.
Avoidance of errors (zero-error principle)	
Previously, inconsistent system states were caused by the so-called overtaker issue. This can occur, for example, when redeployment of short-term fixes is forgotten during roll-out of a quarter release.	Through the use of Conigma, various checks are done in line with the poke-yoke principle (i.e. fault prevention 'by design') prior to transport to the production system, such as • Overtaker checks • Checks for object dependencies • Checks for critical objects There is also the possibility of defining and monitoring dependencies between multiple tickets / changes from the incident system (parallel, sequential, job networks)
Improvement of SAP software manufacturing equipment	
The previous combination of SAP software manufacturing tools and internally developed add-ons led to inadequate handling of the equipment in	Conigma has a contemporary tool that allows different views, e.g. of tickets, users, functional teams, 'release types', etc..

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the "SAP factory". For example, there was no view of tickets that were assigned to a user or 'functional team'.	
Qualification and training of SAP IT staff	
The lack of acceptance (clumsiness and awkwardness of the system) led to a lack of knowledge, wihich lead to 'circumvention' of the standard workflow. Audit compliance was therefore difficult to guarantee.	The training of more than 1,000 SAP power users, customizers and developers from Mettler Toledo or Mettler Toledo service providers in Europe, the U.S. as well as China and India took place in 2-hour webcasts.
Continuous improvement process	
The continuous improvement process (CIP) formed a good data basis for the tool implementation. Reaching the new and improved target state from the measured actual state in the course of the PDCA cycle (Deming cycle): With the previous system, the ticket information was not correctly tracked. The status of a ticket was not unique, the ticket hierarchies were inconsistent and integration into the	Conigma supports the CIP process by ensuring a consistent data location of the actual state. The user-friendly GUI makes it possible to customizes changes in the SAP IT workflow often in hours and not, as with other tools, in weeks and months. All statuses are tracked automatically and can be viewed by the current employee ("automatic phase-

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test system was therefore deficient, which led to a great amount of effort through manual 'clean-ups'.	based transition"). This data set can be used for reporting without problems, is revision-secure and can be used for SOX compliance.

Prior to the implementation of the "SAP IT factory" vision, the SAP development and customizing was characterized by various media breaks that have been fixed by Conigma (see graph below):
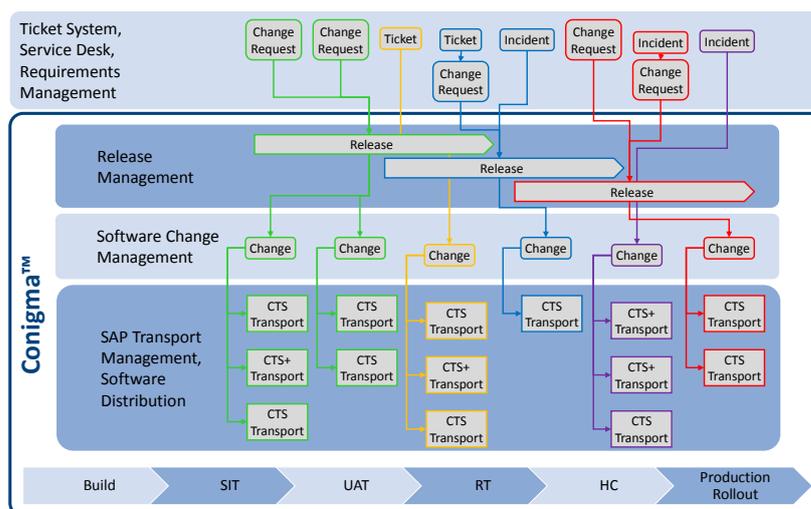
In the course of the project, a transparent, sequenzedIT workflow was realized with Conigma as an "assembly line of SAP development" in the Mettler Toledo "SAP IT factory".

As with Toyota, "SAP IT factory" in line with lean management principles is not an end in itself. No nice-to-have, all hard-facts ratio. In addition to the qualitative benefits such as "zero-error target by design" and "built-in audit compliance", Mettler Toledo

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expects significant cost savings because there are no longer any media breaks.

The author, Malte Klassen, is considered a co-founder of this type of SAP automation tools and consulted DAX companies in the optimization of administrative IT processes about 15 years ago.

Based on this project experience, he founded the Galileo Group AG as a software company over 10 years ago, whose change, release and transport management software, Conigma, is in use today by customers in Europe, the Americas and Asia.

About Galileo Group AG

Renowned blue-chip clients in Europe, Asia and the Americas – including BMW, MAN, Postbank, Siemens, ThyssenKrupp and the Zuercher Kantonalbank – place their trust in the competence of the Galileo Group with its twin commercial departments of IT Services and Software.

With its SAP® release, change & transport management software Conigma™, the group's subsidiary Galileo Tools sees itself as a market leader in the industrialization of SAP operations. It has been proven that over 7% of SAP costs can be saved each year.

In its other business sector, IT Services, Galileo places itself in the 2% of suppliers who have at their disposal both top expertise in the area of SAP Basis and also the supporting technologies required, such as Java/J2EE and .NET.

More information can be found at www.galileo-group.de.

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