"Make IT Faster, Better, Cheaper"

IT Industrialization as a Performance Booster

IT units have always been under pressure, but in recent years the bar has been raised even higher. The business imperative to reduce costs, expedite time to market and increase service quality at the same time are particularly a challenge for IT organizations with heterogeneously grown environments and a resulting variety of operated infrastructure. Against this background Arthur D. Little has developed an IT Industrialization Model that shows how levers such as standardization and automation can help achieve first class IT operations. With cost saving potentials of up to 30%, zero touch operations is the name of the game, referring to fully automated IT operations without any manual – and error-prone – intervention.

High performance wanted!

The increasing expectation of business executives regarding cost-competitive IT operations with minimal lead times, but also the demand for utmost transparency about the hurdles to achieve those, places IT units in a challenging spot: The massive variety of operated hardware and software is not only a key driver for cost – it is a handicap for optimization itself. Linked to insufficient technical reporting and monitoring mechanisms, this heterogeneity results in a lack of transparency about system utilization and error events and ultimately impedes architectural optimization.

On the other hand, heterogeneity generally implies a lack of process standardization and a low degree of automation and tool-support. Following this chain of causation, poor process and tool standardization result in disparate environments, being built gradually by multiple teams without strictly defined profiles and unified configuration. Under these conditions top-notch deployment processes – e.g. to quickly respond to new business needs and to rapidly implement updates – are out of reach. In order to overcome this performance dilemma the IT industrialization trend gains increasing attention for today's IT executives. The idea behind is to establish a more "factory-like" mode of operation by ensuring maximal process automation and standardization as well as virtualization of all IT resources.

Understand which lever to pull

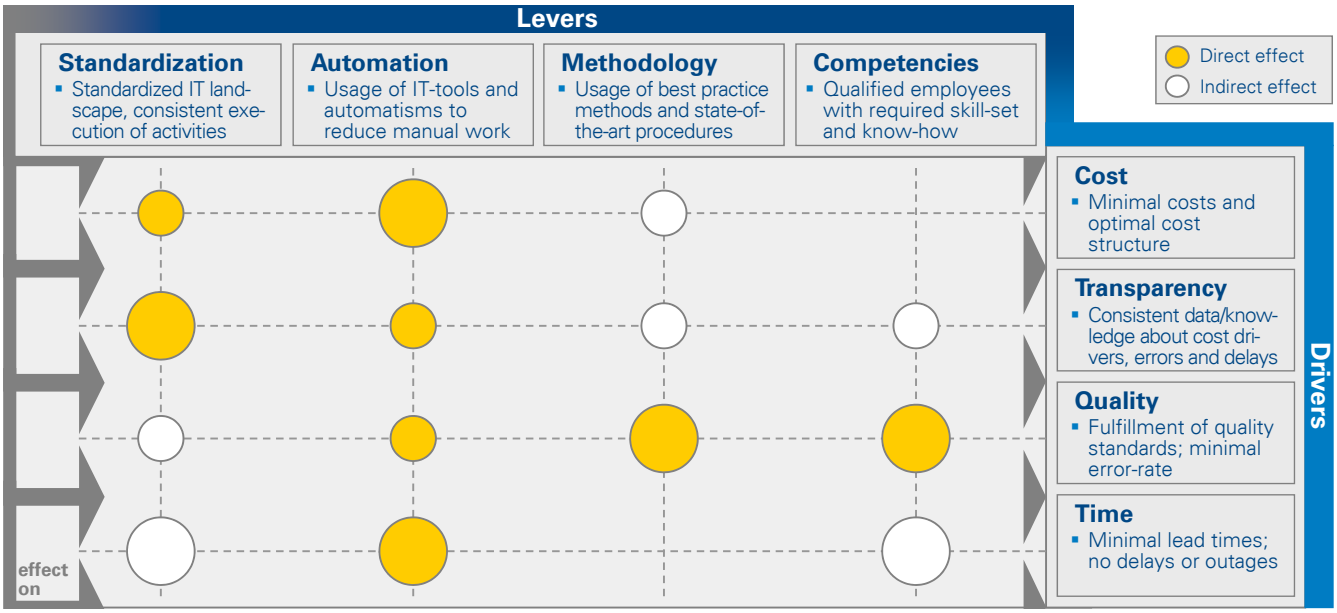
The typical question that arises from the above outlined background is how to maximize the degree of industrialization and thus get a grip on IT performance. The Arthur D. Little Industrialization Model (see figure 1 overleaf) is a framework that captures interdependencies between performance drivers and their primary levers. Our experience shows that particularly automation, standardization, methodology and competencies are the determining factors for a company's degree of IT industrialization.

To realize the desired output, the appropriate set of measures has to be determined for each lever. In the following we will elaborate on standardization and automation as the two most important levers for industrialization.

Standardization

Standardization has been inching its way up the CIO priority ladder in recent years as it primarily paves the way for automation. Generally, standardization comes in two flavours, either technical or process related, both being equally important. From a technical perspective this term refers to the proliferation of today's system landscape, spanning from heterogeneous infrastructure to the diversity and multitude of system types and versions. The struggle of IT staff to cope with various operating scenarios severely impacts service quality and time. It is also a substantial cost driver: On average our clients were able to realize economies of scale of 20% by standardizing operating interfaces and thus facilitating day-to-day operations.

Figure 1: The Arthur D. Little Industrialization Model



In order to harmonize platform elements a consistent platform management has to be established. The key success factors to achieve this are in our experience

- elimination of stovepipes to strip out complexity of day-to-day operations
- thorough documentation and continuous communication of standards
- company-wide governance to ensure relentless adherence and
- likewise involvement of integration partners, since heterogeneity also originates from the lack of centrally governed standards regarding software design

From a process related perspective, standardization has to ensure that roles and responsibilities are continuously applied throughout the organization and that collaboration standards are clearly defined. Process standardization ensures that all relevant process players are involved and easily coordinated according to clearly defined procedures, hand-over points and approval steps – within IT operations as well as at the interface towards the internal customer. Popular examples are non-standardized change processes: As a consequence, IT often has to realize poorly communicated – and thus unplanned – technical changes under high time pressure resulting in costly incidents during implementation.

Automation

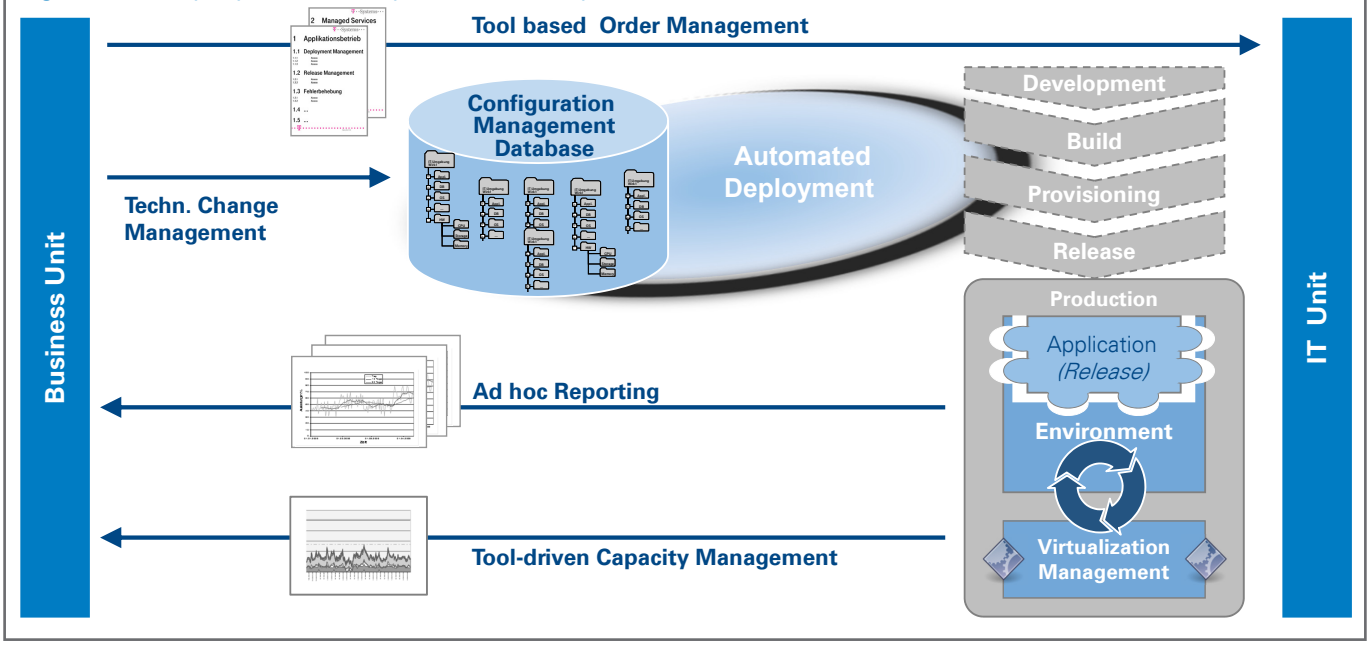
Automation takes center stage of industrialization efforts as it directly boosts all aforementioned performance factors. To achieve fully automated – zero touch – operations, a clear portfolio of supporting tools for the system management process landscape needs to be defined and maintained. The motivation behind is to automate processes and to decrease manual interventions. In most of our projects the target landscape could be operated by only a third of the original resources. While the entire set of day-to-day operating procedures should be object to automation endeavours, our project background shows that the following processes (see figure 2) are of particular importance, altogether constituting a workload reduction of over 60%:

- deployment of new software releases and the set-up of different software environments "at the push of a button"
- technical monitoring and reporting routines
- automated error-prevention mechanisms
- tool-driven capacity management procedures

Especially automatic deployment is one of the focus topics of today's IT organizations. The idea is to release applications to target environments only with "one click" and to roll back to previous versions of the environment in the same simple way whenever needed. Mainly, this comprises an automated build process to package the deployable artefacts, then being provisioned by means of profiles, so called templates, which parameterize the configuration settings to enable provisioning across multiple environments. In a nutshell, deployment scripts are automatically executed with environment-specific deployment parameters on the provisioned target environment.

To set the stage for this automation typical drawbacks have to be resolved at first: Uncoordinated deployment steps, manually ad-hoc modified (build) scripts, isolated version control, disjoint dependency management and diverging environments due to case-by-case provisioning by multiple teams – just to name a few. Most important, consistent coordination of the involved – often physically separate – teams throughout the delivery cycle is

Figure 2: Exemplary Zero-touch Operations landscape



required to achieve a repeatable and auditable release process in terms of a systematic workflow from development through build to production. And second, the management of all configuration data in a central repository is a key prerequisite to maintain consistency of the multiple environments and to disclose accurate configuration settings for deployment.

Considering operational efficiency, a decisive driver for automation is virtualization, one of the top technology trends of the last years. By reducing the amount of physical servers virtualization can massively reduce today's IT cost. It also constitutes the basis for comprehensive capacity management and usage-bound billing ("pay as you use") since the utilization of virtual servers becomes fully transparent. Then again, this trend plays a crucial role when implementing IT automation. For instance, increasing computing power for a certain application in a virtual set-up does not involve manual hardware re-configuration but simply the tool operated modification of a set of parameters.

On the other hand, automation is not a mere IT operations related subject. Catalog based ordering and smooth end-to-end processes via an overarching workflow from catalog to IT production are two important facets in this context. The business side, taking on the role of the customer, should be provided with a standardized service via a system based catalog. Having selected the required services then automatically triggers the offer and order process. The payoff of this approach affects both the business and IT side:

- expedited order and billing processes due to limited manual activities and minimized communication effort
- reduced risk of errors due to system based configuration and plausibility checks
- higher transparency due to one common level of information regarding pricing model, service portfolio, order status etc.
- increased ability to plan and control for all involved parties

Don't strive – immediately – for 100%

Complexity arises due to the fact that the lack of IT performance can have various causes, not necessarily all originating within IT operations, as the above mentioned example regarding the absence of software standards made clear. The identification and design of improvement measures should therefore always take a holistic approach, based upon the following principles:

- Broadening the focus of optimization beyond IT operations to its interfaces towards the business side and system integration partners
- Conducting a thorough end-to-end analysis of the as-is situation to ensure that all root causes along the whole IT Service process chain are considered
- Participation of all involved parties in the analysis and subsequent design of actions to facilitate alignment of optimization measures

When developing the roadmap, do not attempt to resolve all pain points at once, but conduct an incremental procedure during the implementation phase instead. An interdependency analysis can serve as a helpful basis to prioritize the optimization measures. For example, it is recommendable to follow a staged approach when implementing the zero touch processes discussed above: To enable fully automation throughout developments and operations in the future an important intermediate target would be standardization and the introduction of semi-automation at first. Among others, this would comprise

- to adapt the configuration management approach in order to maintain the entire set of information which will be required for full automation
- to harmonize the environment provisioning with standardized templates in multiple environments
- to consolidate the development lifecycle process diverging from team to team
- to standardize development guidelines to leverage automated deployment

Additionally, it is crucial to continuously reflect the roadmap from a business case perspective during the conception phase. The technical standardization efforts normally result in the highest proportion of the implementation costs. Here, future mode of operation can usually not be achieved by means of a "big bang". Instead, the depreciation cycles of existing platforms have to be taken into account in order to prevent standardization potentials from being cannibalized by the costs for updating and migrating the entire range of applications at once.

Just "A" step away

In order to ensure first-class IT operations, industrialization has become a critical area of focus for IT organizations. However, most companies lack the experience, perspective or methodology to conduct the self-assessment and to master the above mentioned challenges. In this context, the Arthur D. Little approach has enabled various companies to assess and improve their degree of industrialization by performing the following five steps:

- **Assess:** Determine the current degree of industrialization by means of an end-to-end analysis of the IT service process chain and identify pain points
- **Advise:** Design a target scenario taking into account our good practice input on data center operations and industry benchmarks
- **Align:** Prioritize actions according to organizational, financial and technical inter-dependencies and develop a roadmap by defining a realistic timeframe
- **Activate:** Define responsibilities and measurable targets and implement the roadmap with interdisciplinary teams
- **Adapt:** Establish monitoring processes to regularly adjust the action plan to changed or new general conditions

Our methodology has been carried out in many optimization programmes across a wide range of industries and has been proven to deliver significant benefits, indicated by expedited time-to-market, improved quality of IT services and reduced IT cost by up to 30%. In over 70% of the projects the effort paid off immediately after the start of the transition phase. These success stories show that our industrialization approach can help IT executives to accomplish their mission: to make IT faster, better, cheaper.

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Arthur D. Little

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