Pursuing Digital Transformation Driven by the Cloud

1

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Could all of the estimated 85 million pet owners throughout Europe use an app to track the activities of their pets? How could smart pills improve healthcare for over 26 million chronically ill people in Germany (cf. German Foundation for the Chronically Ill 2015) by providing them with more personalized treatment? How can a firefighter quickly find the information he needs – building plans, hydrant locations, interactive location maps – at any time of day so that he can get straight to the scene and save lives? How can over 100,000 employees in a global company work together effectively across national borders and local IT barriers? The scenarios could not be more different. But they have one important thing in common: The solution relies on the cloud.

1.1   The Cloud Can Do Many Things

The cloud is the basis for the digitalized business models and processes that will play a pivotal role in businesses in the future. For we will soon be living in a world in which everything is networked to everything else. Studies (cf. Kremp 2014) have estimated that there will be over 200 billion interconnected devices by the end of the decade. Dealing with these vast numbers requires technology that is reliable and stable. The cloud can do that. The Internet of Things, Industry 4.0 – virtually all of the IT sector's recent innovations rely on businesses being able to harness the speed and scalability of the cloud. It is the backbone and the brainpower of the entire digitalization movement. It offers more data storage and data analysis capacity. It makes it possible for an almost limitless number of users to capture and analyze huge data volumes centrally.

There are some conditions, however, including fast, high-performance broadband connections and powerful, secure data centers with high levels of flexibility

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and scalability, and ideally compliant with stringent national data protection and security regulations.

We can discover just how revolutionary the cloud is if we take a closer look at the examples given earlier. Because what they show is that digitalized technologies and processes are now everywhere – in retail, in medicine, in public security, in large enterprises and in industry.

– *Example 1* – "Tail" is a dog app package designed to give peace of mind to pet owners. It comprises a modern tracking and sensing device contained in the dog's collar, and a smartphone application. It lets the dog owner know their pet's whereabouts at any time and tells them if there is anything they need to do to keep their pet secure and comfortable. To ensure the availability of this kind of app, and many similar apps being used routinely every day, there is a powerful cloud solution working silently in the background. Should the need arise, it can collect and evaluate the data on millions of pets from all over Europe and supply a personalized report to each pet owner. It sounds simple, but only because the complexity is hidden from the user and handled by the cloud.

– *Example 2* – FireFighterLog is just one of many applications that have the potential to save lives. It delivers information on the fastest route to the fire, building floor plans, the locations of fire hydrants and the whereabouts of the people trapped inside the building to firefighters in real time on their wearables via the cloud, thereby giving them a 60-s time advantage over traditional emergency response systems. Another lifesaver is the intelligent pill, equipped with a chip that transmits electronic signals as soon as it comes into contact with the stomach's gastric juices. Pertinent data such as the patient's heart rate or sleeping times is transmitted to an app from a wearable sensor patch, allowing the doctor to regularly monitor their patient's state of health and, in consultation with the patient, adjust the dose of medication in real time.

– *Example 3* – The challenge of large-scale collaboration. Storing documents locally along with thousands of gigabytes of legacy data is common practice in many large enterprises. But it is not a recipe for flexibility, especially when you operate across national borders. However, thanks to the cloud, even globally active Fortune 500 companies can achieve the agility they need for success. The cloud enables fast, efficient communication between tens of thousands of employees and provides instant access to growing volumes of business data and applications.

Any list of examples showing the relevance and power of cloud technologies would be a very long one indeed. And in each example, the cloud provides the platform for digital growth, for new business models and for the kind of innovation that our economy and our society need.

As the digital transformation of business advances, it is becoming increasingly urgent for enterprises to become fully networked organizations. Entire process and

supply chains between companies, partners, suppliers and customers are becoming more tightly interlinked. This is creating completely new value networks as well as products and services that are more flexible, more responsive and more carefully targeted.

1.2 Knowing Today What the Customer Will Want Tomorrow

In a world where international competition for the goodwill of consumers has never been fiercer, agility and speed are more important than ever before. Any business planning to find, win over and keep new customers had better be ready to offer them a unique customer experience. But it doesn't stop there. Companies now have to be able to predict what customers will want tomorrow and respond to their wishes even before they have expressed them. Today's big data technologies allow hyper-personalized online shopping, tailored precisely to the individual needs of the consumer – basically a combination of real-time, technology-based data analysis and interpretation and an individualized approach to customer service (cf. Zukunftsinstitut 2015).

However, what applies online must also take place offline, and customer contact has gained new significance as a result of the digitalization process. The automotive sector is typical. There once was a time when the potential car buyer, looking for a Volkswagen, BMW, Daimler or whatever, would pay several visits to their local dealer to check out the cars and get advice on what to choose. Today when they go to the car dealership, they will already have been online to browse specifications and prices and will generally be much better informed. The car salesman has just one opportunity to seal the deal: He has to offer the buyer significant added value as soon as he enters the showroom. And with the aid of IT, he can do exactly that. Omnichannel retailing and value networks offer completely new sources of information and thus new ways for dealers and customers to interact.

Using iBeacons in the showroom vehicles and a customer app, Customer Experience Management solutions (CEM) can even identify which model the potential buyer is interested in. Test drives can be booked and prices retrieved immediately and with very little effort. As soon as the vehicle has found a buyer, it is entered into an interactive service program, which makes servicing and repairs (and quotations) transparent for the customer as never before. The cloud provides the ideal conditions for building close customer relations.

1.3 "Cloudification" Knows No (Industry) Limits

Digitalization has become the new and indispensable tool for companies not only because it facilitates direct contact with the customer. Industry is experiencing a digital transformation of the entire value chain – from design to product development, manufacturing, transportation and logistics through to sales. Virtually all industries are having to adapt their business models and products as a result. And

once again, the cloud is the key to success. Port logistics is a case in point. If container traffic volumes are forecast to more than double by 2030, but a major international port has already reached the limits of its capacity, the port authority will have no option but to optimize its handling processes simply to maintain its own competitive position. Digital technology can help speed up the flow of traffic and goods and shorten the handling and waiting times of container ships. It can also help port managers as well as depot, terminal and car park operators and freight forwarders to react more quickly to the prevailing transport and infrastructure situation.

Then there is the example of food logistics. While Rewe online and Bringmeister have increased their share of the traditional German retail market thanks to clever customer service initiatives like same-day delivery and multichannel models, other business models with proven success outside Germany, such as Amazon Fresh and eBay Local, are waiting in the wings ready to conquer the German market. This shows that two things are happening: The traditional players are no longer the only ones dealing directly with consumers – and logistics specialists are now coming face-to-face with the customer. If a customer orders with a cloud-based app, they can have their groceries delivered very quickly. If they cannot be at home to accept the order personally, they have the option of getting them delivered to, say, the trunk of their car. The GPS coordinates for the car are sent by phone to the supermarket delivery person and at the same time a highly secure, cloud-based authentication and authorization system gives them one-time access to the trunk.

Scalable, high availability cloud solutions allow businesses to respond to market needs more effectively than ever before. The businesses who are taking advantage of these solutions are more innovative and have the resources available to pursue their own growth strategy. In other words, IT is the business and the cloud is the enabler. But this also means that getting to grips with digitalization has become a business necessity. The next seven topics offer some guidance to those wishing to keep pace with digital developments and understand their impact upon strategy, technology and organization.

1.3.1 Everything Stands or Falls with Digital Business Models

No business process can get by without IT today. There is very good reason why six out of the ten most valuable companies, including Apple and Google, are IT companies or IT-based companies (cf. Forbes 2015). The cloud supports the formation and the business models of many new and successful companies. And the consequences are huge. Digitalization has the potential to drive economic growth and increase sales for companies all over the world. Experts at McKinsey believe that by 2025 Internet technology could boost gross domestic product by 207 billion euros in Germany alone (cf. Dürand et al. 2014). This is an increase of nearly five percent. In order to achieve this, however, the German economy will have to succeed in setting standards for digitalization and developing some powerful business models.

"Ubering" Traditional Business Concepts

Uber, Airbnb and eBay are obvious examples of how digital change has long been a motor of innovation. The digital business models of each of these newcomers put the traditional market-leading enterprises under tremendous pressure. If they are to avoid being "ubered," as management consultant Roland Berger (cf. Berger 2015) aptly described this development, the "majors" in all industries will have to be even more vigilant in the future. Because the pace is relentless. According to market and technology experts, many companies will not cope with the challenges that await them. Gartner predicts that "digital incompetence" will cause one in four companies worldwide to lose its competitive ranking by 2017 (cf. Gartner 2013). Nevertheless, this also means that the majority of businesses will successfully meet the challenge. Market participants can therefore control whether they are a winner or a loser in the digitalization game.

Staying in the game demands agility and speed in all areas, together with innovative products that harness the benefits of digitalization. The German car industry is a perfect example. The technology fitted to today's cars has turned them into mobile data centers, a concept that has not escaped the notice of others, including US manufacturer Tesla with its Model S. All vehicle functions are controlled via a central tablet. The Internet, software, sensors and applications form a central nervous system through which vehicle data travels at high speed. But this nervous system must also be extremely powerful. At the point where conventional technology solutions reach their limits, highly scalable and secure cloud solutions have become indispensable in taming the "explosion" of data volumes and providing stability, high availability, and most importantly, security in the transmission of data. It will not take until 2050 before we have mass produced cars that allow the driver to increase the power of his engine by 10 or 20 percent whenever he requires an additional burst of horsepower simply by tweaking the engine management software via the Internet. Every carmaker is expected to have the necessary "chip tuning" solution in their options catalog within five years.

1.3.2   CIO and CEO – Best Buddies?

So who will be responsible for ensuring that digitalization is prioritized within the company? The CIO and the CEO are really the ones who need to push for the transformation and development of digitalized, cloud-based business models. They will have to understand and communicate the potential of the cloud to each department. The overall framework is in place. A new generation of IT leaders is currently emerging, bringing with them a dedicated business background and a business mindset. Thanks to the talents of these CIOs, CEOs are free to concentrate on their vision for the company. Although the CEO must understand the basics of the technology, he does not have to be too concerned about the potential pitfalls because this can distract from the pursuit of the company's vision. The CIO, for his part, must support the vision but still check it for feasibility.

Is the Chief Digital Officer the New Creativity Manager?

Digital transformation is forcing companies to update IT systems they have used for many years. This is often done by highly qualified specialists without the luxury of being able to shut down the systems or relax security rules. To help them meet these challenges as they move forward with digitalization, more and more CIOs are finding it useful to recruit a CDO. Chief digital officers, many of whom have followed a different career path and often come from the digital creative industries, can strengthen the team by contributing new perspectives, ideas and solutions (cf. König 2014). The CIO has the final say, of course, because he has the ultimate responsibility of integrating new applications and processes safely and reliably into the company's IT.

1.3.3   A Two-Pronged Approach

There will always be two aspects to any transformation towards the cloud: the operational system and the new, agile IT. Despite the need for innovation, the day-to-day work of the CIO is vital to the company's effort to create value. With the exception of startups, companies are only able to jump onto the moving train of digitalization if their traditional IT operation is running securely and reliably. Nevertheless, a dual IT infrastructure gives traditional companies the opportunity to compensate for this limitation. Digital devices provide the necessary speed and the additional agility. According to Gartner, around three quarters of all IT organizations will be working with Bimodal IT (2-speed IT) by 2017 (cf. Gartner 2014) – in other words, with the traditional IT that has evolved in the enterprise over the years and the new, agile IT designed to meet the needs of the future. Instead of going to the considerable expense of rebuilding and updating their existing IT infrastructures and processes immediately, many companies find it more effective to implement innovative, parallel digital solutions (cf. Rimmler 2015), which allow them to transform their business in stages.

Daring to Look at Things Differently – The Young IT Tearaways

If this transformation is to succeed, it needs people who think digitally. It needs a new IT generation that is business focused and curious and has a completely different perspective on technologies and processes. People who look for routes well away from the established, well-trodden ones and contribute a sense of risk tolerance and pragmatism from which the company can gain a great deal. If one solution does not work, they are bold enough to alter their approach. They believe in "killing it fast" and moving on. To create maximum added value for the entire enterprise, all players are required to define the key elements of their collaboration on a regular basis.

1.3.4 You'll Never Walk Alone – Side by Side on the Way to the Cloud

Because projects have a tendency to increase in complexity, sometimes even during their initial tender phase, it is important to have a partner on the supplier side who can provide flexibility as you progress toward successful digital transformation. An external IT service provider can offer more than just a fresh perspective on business processes and IT structures; they can also offer a wide range of expertise, will already have implemented numerous excellent cloud solutions and, ideally, will be used to thinking and acting from the perspective of all stakeholders. A partner like this will offer the customer genuine added value and will recommend and implement the cloud model that best suits their individual needs.

With this in mind, a provider should be able to offer their customers a wide range of interlocking cloud services from multiple vendors. In addition, providers should have transformation experience as well as process and sector expertise in projects of all sizes. This also applies to large corporations working in sensitive industries with high security-critical requirements or for whom high availability is an important criterion. An IT service provider must be familiar with the development and operation of hybrid cloud architectures which allow business-critical processes to move between different types of cloud services as needs change.

"Simple, Secure and Affordable" Boosts Acceptability
Dynamic delivery models such as IaaS, PaaS or SaaS, embedded in the IT and business strategy and part of the quality and safety concept, are poised to become pillars of enterprise IT. But to achieve this, they must be scalable and simple, secure and affordable, and they must also meet the company's compliance requirements. Moreover, processes, roles and service levels must be discussed and tailored to the cloud, in close cooperation with the departments involved.

During these discussions, if not before, the provider must provide answers to the key issues of digitalization: Which processes and infrastructures, and which parts of the value creation process should a company transfer to the cloud? Which path is the right one? How will business-critical data be handled? And what will it cost? And then, of course, the provider will have their own questions. For example, does the company have a bottom-line or top-line strategy? Do they want to increase income and efficiency or would they rather generate growth? (cf. Investopedia 2015). The list goes on. One thing is certain, however: There is no magic bullet. Every customer is different but necessary problem-solving competence remains the same. An IT provider with a breadth of expert knowledge is well placed to supply that competence.

1.3.5 The Cloud Also Means Partnering with the Very Best

To meet the exacting demands of digitalization and stay at the cutting edge of technology and software development, technology partnerships are essential,

because today's cloud computing is all about collaboration, about managing complex ecosystems that individual IT providers cannot reliably handle on their own. They therefore need to work with experienced partners. It does not matter in what country or even what continent they are based. What matters is that they collectively develop the solution that is the most beneficial for the customer.

The ideal IT provider has invested many years in building a cloud ecosystem of leading technology partners that allows them to identify and assemble the best possible solutions. By selecting the right partner, with the right expertise and a technology portfolio to match, companies not only obtain a solution that ideally fits their needs but gain the added benefit of advice in matters relating to IT innovation, transformation and data center solutions. The provider is the vital central cog here, pulling together the various strands of the project, providing quality management, catering for diverse needs and overseeing the entire value creation network. Many companies are looking for a retail solution that is straightforward, with a simple and intuitive frontend, but also a backend that meets the highest security standards.

Successful cloud solutions stand out by offering maximum cost effectiveness and easy integration into existing IT environments. A good provider with their cloud partners knows how to seamlessly integrate enterprise and IT processes. A quality management system with partner certification will be a central component of their partner program. Overall, what matters most is expertise along an open and agile collaboration environment that makes it possible to offer the best solution from the customer's perspective. Ultimately, the focal point must always be the customer and his requirements.

1.3.6 Maximum Performance Through Maximum Security

A business cloud contains a company's prize assets: its customer and production data, its strategic content and its sensitive key indicators. Organizations cannot therefore simply place their business-critical data and applications in a normal consumer cloud. They should also know which data center the provider is using to send data to the cloud. They should be safe if the provider uses a secure data center based in Germany compliant with German regulations, as the German Data Protection Act is one of the strictest informational self-determination laws. The use of personal data is strictly prohibited and requires explicit legal permission or the consent of the person concerned. In the Anglo-American legal systems, the exact opposite is true. The US intelligence services can use American terror legislation to access personal data even without a court order. The USA FREEDOM Act, which superseded the USA PATRIOT Act in July 2015, offers better protection for the personal data of US citizens in the United States, but did not change the situation for personal data held in foreign data centers. Those wishing to place their data under the protective shield of German law with the data centers of service providers based in Germany are still in good hands.

The issues of data security, data protection and compliance must be part of the "big picture" of any digitalization program: Data and applications must be kept

available, information protected from unauthorized disclosure to third parties and legal considerations taken into account. This is irrespective of whether the cloud is public or private, or a mixture – an approach that is increasingly finding favor with business today. Country-specific laws and regulations insist that these standards should be an integral part of any cloud strategy (cf. Experton Group 2015). This is made possible by the use of, for example, vendor-independent cloud encryption, the keys for which are held by the user companies.

A business-compatible cloud is also equipped with sophisticated defense systems. The provider is responsible for carrying out ongoing preventive work on the security architecture to protect the infrastructure and the customer's systems. Effective IT security is constantly learning, never static and a steadfast partner from the very beginning.

1.3.7   Highest Quality as the Basis for IT Transformation and Digital Growth

The greater the influence that IT has on a company's operation and growth, the more critical the reliability, stability and agility of the IT systems are for the company's success. This means, more specifically, adopting preventive measures such as redundant technologies and taking a comprehensive, end-to-end quality management approach. The risk of outages causing billions of dollars' worth of damages, reputational risks and serious data loss make the highest level of reliability vital, and for most businesses more important as a purchase criterion than the price of the cloud solution itself (cf. PricewaterhouseCoopers 2012).

One thing is certain: IT without incident does not exist. Businesses and IT providers must therefore work closely together to manage and minimize the fallout from incidents and to ensure that the highest quality is maintained. A study by the consulting firm Sopra Steria found that one in two German companies has no contingency plan for IT security incidents (cf. Steria 2012). This is just one area where much needs to be done to improve quality.

A comprehensive quality assurance system must consider the interaction between people and technology. To maximize IT security, technology partners have to work proactively and anticipate potential problems at an early stage. Service level agreements can help define high process standards.

Contingency management should not be ignored for those occasions when IT fails to operate reliably.

A case can be made for having a "manager on duty" (MOD) on stand-by around the clock, who can be contacted in the event of a crisis and who has the authority – unlike call center agents – to put measures in place to rectify the incident immediately and professionally. And, if necessary, to involve top management to expedite decisions on budgets and resources. It is certainly true that, to keep everything running smoothly, it is essential to have clearly defined contact persons, processes and KPIs. This saves valuable time in an emergency and minimizes downtime, frustration and costs.

The objective is to maintain a highly available, secure IT infrastructure at all times and to take continuous action at technical and organizational levels to ensure maximum stability. This is a service benefit that will ensure complete and continued customer satisfaction. In a nutshell: Without quality there can be no cloud and without the cloud, enterprises have a diminished capacity to innovate.

1.4   Conclusion

Digitalization and cloud-based processes are the key business drivers of the twenty-first century. When established as a platform for business processes, they offer companies unique growth opportunities and the potential for achieving a distinct competitive position and driving innovation.

For this to happen, measures need to be put in place now. Business strategies need to be defined and forward-thinking business models developed. The roles of CEO, CIO and CDO need to be allocated. The right IT partner, with their ecosystem and cooperation partners, need to be selected. The essential factors for a successful digitalization project are quality, stability and agility. IT managers themselves should design and implement innovative solutions according to the criteria of scalability, reliability, security, affordability and simplicity. Only when these points are internalized will companies be ready for the future and ready to reap the considerable benefits that digitalization has to offer.

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