

Falk Uebernickel and Walter Brenner

2.1 Motivation

The world of information technology (IT) continues to undergo rapid change. The appearance of new technologies such as cloud computing, mobile communication, social media or big data is exerting a lasting effect on established industries and is even forging new industries and shaping society itself. Examples include companies like Zalando¹ or Car2Go,² which have successfully used IT to set up new business models and go head-to-head with established companies in the market. This progress requires agility (cf. Schaffry 2012) and customer focus, as well as efficiency, effectiveness and quality across the entire IT sector. Both the “clock speed” now required for product development and the pace of development for new application systems or mobile device applications are accelerating significantly. At the same time, requirements for these systems’ operational stability, security and flexibility (in terms of scaling) are also growing. On the customer side, we observe a new, higher-quality kind of IT literacy. The “digital natives”³ are demanding new, IT-based solutions for their daily tasks at home and in the office (cf. Brenner et al. 2011).

There is an obvious parallel to developments in traditional industries. As it matured over the last 100 years, industrial manufacturing passed a number of milestones, starting with standardization and the streamlining of process flows,

¹ Formed in Berlin in 2008, Zalando is now one of the most successful footwear and fashion stores online.

² Car2Go is a car-sharing business set up by the car maker Daimler and the car rental company Europcar.

³ The term “digital natives” is used to refer to people born after 1980. Digital natives are characterized by the ease with which they interact with IT and technology.

F. Uebernickel (✉) • W. Brenner

Institute of Information Management, University of St. Gallen, Müller-Friedberg-Straße 8, 9000 St. Gallen, Switzerland

e-mail: Falk.Uebernickel@unisg.ch; Walter.Brenner@unisg.ch

continuing with the explicit assurance of quality, and culminating in an end-to-end customer focus in production. The entire IT sector faces similar challenges (cf. Zarnekow et al. 2005). On the one hand, there is both the compulsion and the necessity to focus on the customer, innovate and be agile; on the other hand, continuous improvements to effectiveness, efficiency and quality are also critical (cf. Bravo-Sánchez et al. 2005). These challenges and the process of change are affecting both in-house IT units (within companies or corporations) and IT service organizations (occasionally described as IT service providers), which, with outsourcing revenue totaling USD 246.6 billion in 2011 (cf. Gartner 2012),⁴ are making a considerable contribution to IT value creation. At the end of the day, structural problems will be the fate of anyone resting on past laurels!

For this reason, we may ask which factors will be critical for the success of IT service organizations in the future. To be able to answer this question adequately, we will first take a look at the future positioning of the Chief Information Officer (CIO) in companies and corporations, so as to derive a corresponding scope of duties. Here, we will be drawing on 50 interviews conducted in 2012 with CIOs, senior IT management staff and Chief Executive Officers (CEOs), most of whom were working in DAX-listed companies at the time. From this standpoint, we then return to answer our main line of inquiry, namely the success factors for IT service organizations.

2.2 A World in Flux

Facing up to the need to change presents a major challenge to both companies and people alike. Change implies upheaval, and is equated with the abolishment of outdated—yet familiar and habitual—methods and mechanisms. The uncertainty of the future is associated with the fear of inadequacy and the fear of its consequences. Yet both change and upheaval also imply progress for a company, and for society at large. Change is the process that drives the exit and entry of companies from and into markets, while existing companies grasp change as a mechanism for adjusting to match new circumstances—which, in turn, are accompanied by new chances for growth. Within these processes of change, IT unarguably has a major role to play, both in the digital economy and in traditional product-oriented industries such as the automotive sector or retail. Directly associated with this is a change in the business role of the CIO and the positioning of IT service organizations within the market—both today and in the future. The era of the “Head of Data Center Operations” or the “IT Service Organization Manager” is most certainly over (cf. Brenner and Witte 2007). The nature and velocity of these changes require affected individuals and organizations to adapt the ways in which they think and act. The following section discusses examples of IT-driven change.

⁴ From 2010 to 2011, growth in outsourcing revenue was an impressive 7.8 %.

2.2.1 Business Models Built on Information Technology

In recent years, trends such as networking, data integration, a massive increase in data processing capacities and others have created an environment where new business models can be generated by IT. In other areas, the consumer-driven need for solutions integrated into day-to-day life has also contributed to a new wave of company start-ups. Whether we look at existing industries or new ideas pursued by young entrepreneurs, the change driving and being driven by IT is a global phenomenon and only the initial phase of an enduring trend.

What are its implications? Keeping pace with this change requires fast turnarounds as well as a high degree of agility and flexibility. Customer requirements often “materialize” very rapidly and require a prompt response from industry players. While tried-and-tested business models and businesses have persisted for decades in some cases, modern development cycles are characterized by much shorter periods. One of the enabling factors here is an IT infrastructure increasingly based on standardized and modularized components and technologies. The deep integration of IT into machinery, day-to-day appliances and vehicles (“embedded systems”) is also offering previously unavailable levels of accessibility to information. To adequately meet these challenges, companies are faced with the task of querying their established processes and organizational structures.

One example is Daimler, which teamed up with Europcar in 2012 to launch the company and eponymous car-sharing service “Car2Go”. In contrast to traditional car rental business models, the customer is no longer tied to fixed rental locations for hiring and returning a vehicle. Instead, the vehicles are scattered throughout the urban area, and can be located and hired using a mobile application. Managed by in-vehicle sensor systems, all of the consumption and mobility data can be accessed and used to bill the transport service provided. To function, this business model is critically dependent on the calculation of the rental period to the nearest minute, the miles driven, the fuel consumption and other parameters. Implementing a business model of this type would be unthinkable without the extensive deployment of information technology. Similar models are now also being operated by BMW (DriveNow).

A further example of the integration of IT into traditional industry is shown by its utility for business applications (business to business, B2B). Back in the 1960s, Rolls-Royce’s aircraft engine manufacturing unit was already offering its “Power by the Hour” service. At its heart, this service ensures preventive maintenance and upkeep for engines. The service portfolio has been considerably expanded since 2002. One addition is a real-time monitor, which deploys information and communication technology to enable the collection and evaluation of additional machinery-related data. This enables a permanent exchange of data between the engine, the aircraft and the manufacturer. This represents a fundamental change of the business model: instead of selling the customer an aircraft engine as an investment, the manufacturer offers the airline an engine that is always fully operational. The approach also aligns the business models of Rolls-Royce and the airline: Rolls-Royce generates income whenever an aircraft is airborne.

The market is also home to many start-ups, which are creating business potential or taking a revolutionary approach to existing models. As one example, Airbnb has used an internet platform to open up a new segment in the hotel sector. For residential property owners, Airbnb offers an easy way to compete with traditional accommodation providers by offering cheap overnight stays to tourists and business travelers. Since its launch in 2008, around 10 million overnight stays have been booked using the portal (cf. Airbnb 2012). In 2012, user numbers grew so sharply that an online booking was completed every 2 s.

Groupon provides us with another example. The Groupon website can be used by restaurants, cinemas, theaters, travel agents or product manufacturers and other service providers to offer their services for a limited time. Discounts and reductions are granted depending on the total number of buyers for a service or product, and are immediately visible to all participants. The company's business model sees Groupon taking a cut of the revenue generated. To date, the model has proved so successful that it has been copied in many other countries. One competing service in Switzerland, for example, is *deindeal.ch*.

2.2.2 New Competitors

Provider or customer? In terms of the IT service organization market, finding an answer to this question is no longer a simple matter. A few years ago, the situation was clear: providers such as IBM, HP or T-Systems were offering professional services for information technology on a global scale. On the opposite side were companies whose business focused on the sale of other kinds of products and services. This principle no longer holds true, however. Leading the charge into the market for new providers of infrastructure-like IT services is Amazon.com, whose "S3" cloud service product had almost an exabyte of storage space at the end of 2012, according to industry estimates⁵ (cf. Rodriguez 2011). This makes Amazon.com about 20 times larger than the prominent storage provider Dropbox (estimated at 40 petabytes) and, in all likelihood, the largest professional storage provider.

In terms of IT services rendered directly to the customer, Google has conquered large portions of the market. Starting as a "humble" search engine provider, the company has progressed to professional IT service provision for email and office products—such as GoogleDocs and GoogleDrive. In mid-2012, Google announced that the number of registered customers actively using its email service had passed the 425 million mark (cf. D'Orazio 2012). Statements from the company also suggest that several million business customers have migrated part of their IT support to Google, including household names such as Capgemini, General Electric, Roche and Genentech. The dynamic growth shown by Amazon and

⁵ 1 exabyte = 1,000 petabytes = 1,000,000 terabytes.

Google is impressive, and casts the achievability of economies of scale and efficiency in a new light.

These two companies serve as excellent examples of the predominant market dynamics in IT, and the requirements that these entail. In certain areas such as infrastructure or the kinds of business process-neutral IT services offered by Google, CIOs and companies are demanding that services provided meet new standards in scalability and efficiency.

2.2.3 The Customer Factor

The following quote from a DAX 30 CIO, from an interview held in summer 2012, illustrates the growing importance of customer expectations: “... *this attitude has been drastically changed by Amazon, Google and eBay. When you go to Amazon today, then Amazon just knows the last thing I bought there. Customers have no problem with this and in fact see it as a plus. And our customers are now starting to lose patience with us if we don’t know which product it was they bought. The customers project these experiences onto us. [...] Customers expect this to be a standard, but in some areas we’re nowhere near that right now.*”⁶ Customers want to exert more influence on the design of information systems. Their experiences as consumers—and in particular through the use of platforms such as Facebook, Blogger, Instagram and a range of applications on Apple’s iPhone/iPad—are having a major impact on their expectations for application systems and the design of user interfaces. Compared to usability, requirements for data protection and data security appear increasingly to be of lesser concern, especially among the younger generation. For CIOs, the consequence is a new set of demands for the development and operation of these systems. Priority is given to agility and customer involvement, even at an early stage of development. At the same time, new skills are in demand from development unit staff in order to implement the requirements in software.

Hand in hand with customer influence goes the trend towards consumerization, i.e. the reversal of the traditional flow of IT innovation from large organizations in the direction of the end consumer. This means that software and IT innovations are increasingly being created at the point of use or specifically for consumers, before then going on to influence corporate software design (cf. Escherich 2011). Customers and employees are increasingly “emancipated” in how they use and select software and hardware. IT services can be sourced from the cloud—e.g. as “Software as a Service” (SaaS)—for almost any department in a company, such as for sales support, enterprise resource planning (ERP) systems, video conferencing systems, etc. The cloud software provider Salesforce.com has become well-known in this context.

⁶ Interview with a DAX 30 CIO from summer 2012.

Interest is similarly strong in corporate “bring your own device” (BYOD) strategies. Here, companies encourage employees to bring IT equipment of their choice to work and use it in the office. Apple devices are particularly popular in this context. Consumerization thus offers IT organizations and CIOs new opportunities to participate in innovation processes and allow for change processes within the company. Such chances are also associated with new challenges, however, such as the management of “shadow IT”, i.e. workplace-deployed software and hardware that by definition lies outside the CIO’s knowledge domain and sphere of influence (cf. Brenner et al. 2011).

2.2.4 Technologies

Moore’s Law⁷ has proven true for decades—and no end is yet in sight. The transition with regard to information and telecommunication technology is in full swing, and influences both people’s daily lives and the ways in which companies do business.

Smartphones Smartphones are currently the strongest driver of technological change. Devices such as Apple’s iPhone or the Samsung Galaxy are not so much telecommunication devices but fully-fledged computers. Equipped with high-powered processors, sensors and cameras, GPS, accelerometers and high-resolution displays, these devices now take center-stage in terms of people’s communication with their surroundings. If we assume that Moore’s Law will continue to apply, future versions of these devices will exhibit enormous processing power and deliver high-precision sensor data, which could lead to new applications such as virtual reality. In addition, the use of the phone’s screen as the sole means of presentation is no longer essential. Data can now be displayed in real-time on glasses, headsets or on external displays.

Collaboration/Broadband and Wireless Networks In the digital era, the provisioning of global networking and network bandwidth for data communication that is accessible, of high quality and available worldwide will be one of the most important factors for success. 3G and 4G networks are already rising to the challenge of meeting growing demands. Driven by colossal growth in the field of collaboration and communication, demand will continue to increase in the future. To match it, network structures will need to offer substantially better agility and flexibility. The ability to bring employees together at the right time, despite their spatial and hierarchical disparities within the company, will remain one of the core challenges in the future. Existing solution strategies include unified communication and collaboration (UCC) systems, video conferencing and chat rooms.

⁷ Moore’s Law states that the number of transistors on a computer chip doubles over the same area within a period of 12 months.

Cloud Computing In the future, large volumes of data will need to be available anywhere and at all times for both companies and individuals. The underlying technology is known as “cloud computing”: Professionally managed data centers use distributed (usually worldwide) data storage to make data permanently available to its users. The market offers only a few successful providers. In the private consumer segment, one can point to services such as Apple’s iCloud (iTunes Match) or GoogleDocs. In the commercial client segment, Salesforce.com is one of the leading cloud providers. This technology can be leveraged to design integration scenarios between individuals and organizations involving entirely novel approaches to architecture. Case studies from Europe’s German-speaking regions reveal that, in a professional capacity, CIOs primarily rely on private cloud products from IT service organizations. In the Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) segment in particular, CIOs have a large portfolio of services to choose from.

Big Data A direct corollary of the many sensors in use at home and in the office—combined with the growth in machine-to-machine communication (M2M communication)⁸ as well as smartphones as “social sensors”—is the rapidly increasing volume of data now available to companies. “Big data” is used as an umbrella term for technologies that enable the storage and processing of these vast quantities of data. One example is Apache Hadoop, a distributed storage and processing framework for very large quantities of data that relies on highly-standardized—and thus low-cost—computing and network infrastructure. Other technologies will follow in the years to come, primarily based on non-SQL databases.

2.3 The Evolution of IT

Which process led to the developments described in the last section? And what informs the prevailing patterns of strategy and action for contemporary company CIOs? Part of the answer can be found by considering IT development from a historical perspective (cf. Brenner and Witte 2007).

The Age of Production The 1960s and 1970s were a time when companies began their foray into IT in the form of electronic data processing. Company accounting was one of the first areas to benefit from IT: this was a highly repetitive task featuring mature processes and structures. Initially, the majority of such work involved the automation of bulk data processing by using “batch runs”. Later, the systems were also deployed to support and optimize production workflows. Networking as we understand the term today was unknown at this stage, and was

⁸ M2M = machine-to-machine communication, refers to the concept of the growth of networking between machines for the mutual exchange of transactional information.

limited to no more than the interconnection of the various information systems within the company. The only workplace computers visible were terminal devices, and they were few and far between. The job of IT management at this point in time was limited to simply keeping the IT up and running. There was no real sense of connectivity between the business units and IT. On the contrary: the IT unit in fact wielded considerable power, since expertise for its complex machinery was fairly limited within the company, although its use was already regarded as business-critical.

The Age of Supply Chains and Major Projects The second era was characterized by large-scale projects and collaboration across corporate boundaries. Until this time, data repositories had generally been maintained and stored individually per application system, and integration between discrete application systems was uncommon. It was only the process of advancing industrialization in the IT sector that created a need to integrate application systems along the supply chain, so as to facilitate the exchange of data beyond the confines of a single company. For CIOs, work at this time focused on large-scale projects and transfer programs. Their core competency was no longer “merely” managing data center operations, but involved guiding major projects in line with traditional parameters such as time, budget and quality. This produced the first significant change in the CIO role: The earlier, technology-focused image of the IT unit faded away as business units came to associate the CIO with application system development. Senior IT management nonetheless continued to maintain a certain distance from the business units.

The Age of Information and Communication From 1990 onwards, the utilization of information technology to support the communication, aggregation and processing of information and data began to gather momentum. One factor in this development was the runaway success of the personal computer (PC). System architecture became distributed and the reach of technology extended far beyond the walls of the data center to the employee or user’s desk. Unfamiliar issues about centralized and decentralized information technology were suddenly part of the agenda. Many CIOs saw the introduction of the PC as a threat rather than an opportunity. Yet the deployment of these PCs marked the start of a new era. The first knowledge processing systems were created—the era of “knowledge management” projects had arrived. This was also the time when the business departments first exhibited an interest in getting to grips with application systems. Intelligent telecommunications systems—the precursors to today’s UCC technology—started to be introduced, and the take-up of email spread like wildfire. At the same time, use of integrated software packages—such as those offered by SAP—also became more widespread. CIOs were tasked with helping to revise existing processes and organizational structures to work with these software systems.

The Age of the Customer We describe the contemporary era as the “age of the customer”. As shown in the previous section, customers are no longer merely consumers, but have expectations and ideas about requirements that, with the aid

of IT, fundamentally impact the corporate development and production process. As one example, the Adidas product configurator used in the “mi adidas” range (cf. Adidas 2012) presupposes not only a highly efficient and effective IT backend but also a radically customer-focused company. The service lets fitness enthusiasts configure an individual sports shoe perfectly tailored to their requirements and then have it manufactured as a custom item. Starbucks involves customers in the development and continuous improvement of new or existing products via its “My Starbucks Idea” (MyStarbucks 2012) web portal. Customers can provide feedback and offer ideas that can then be taken further by the responsible development team at Starbucks. The French ski manufacturer Rossignol serves as another example. The “Ski Pursuit” application (Rossignol 2012) gives the company real-time field data from both potential and existing customers. Such data can then be utilized by product development. The list can be continued ad infinitum. One thing is clear, however: The distance between companies and customers has shrunk significantly in the last few years. Information technology has extended its reach far beyond the data center and the workplace. Sensors in smartphones, machine-to-machine communication (M2M), mobile wireless networks, modern production procedures, etc. have all led to a situation where IT is present in almost every product and has matured into a distinguishing factor within many industries. CIOs need to adapt to this change. Supplementing technological expertise for the implementation and operation of mobile applications, CIOs must improve the skills of their own workforce to meet the demands of the digital natives.

2.4 Rethinking the Role of the CIO

How do these changes impact the work of CIOs, both today and in the future? This was summarized as follows by the CIO of a prestigious insurance company: “As modern CIOs, our responsibility is threefold: costs, security and innovation”.⁹ The last sections clearly show that IT will take on an expanding sphere of responsibility. The approach taken by CIOs to leverage and personalize this functional remit will vary from individual to individual. While CIOs must ensure tasks remain manageable, this also requires harmonizing a range of aspects. This challenge is also reflected in the new understanding of the CIO’s role.

2.4.1 Balancing the Needs of Optimization and Innovation

The CIO’s sphere of responsibility continues to expand in the direction of business and the customer. This goes hand-in-hand with a shift in the duties required of the

⁹Quote from an interview held in March 2012.

CIO by the CEO (cf. CIO Executive Council 2010). CEOs increasingly expect company IT units to be a partner of other business units, so as to promote a high level of integration, business focus and customer orientation. This is driven by the realization that IT is not merely a commodity, i.e. a standard product (cf. Carr 2003), but has a crucial role to play in deciding the success of products, services and business models in the future. In this future, IT will make up a considerable proportion of most products in the market, from the family car to the washing machine. One CIO described the situation as follows: “*The large monitors used by IT staff display not only system availability, but also the latest e-commerce figures.*”¹⁰ The example reveals an ever-growing degree of integration between IT units, the company and its business. Indeed, this practice is taken so far that the same key performance indicators are used to measure both business success and the CIO’s performance.

In practical terms, we observe increasing involvement of the CIO throughout the company’s planning process for new products and services. From brainstorming to product development, production and marketing, CIOs now have a key role to play. As a result, CIOs are fostering business expertise in their units. In return, the business side is granting deeper insights into the mechanisms and procedures behind production and service provision. This process of expansion is still very much underway and is by no means complete. Corporate development teams no longer work exclusively “transactionally”, i.e. guided by formal processes, sequentially organized and rarely engaging in interdepartmental work: instead, they operate in a collaborative, team-oriented fashion. Diversity within these groups is no longer seen as a disadvantage but as a benefit. Knowledge from production and product development is supplemented with technological expertise from IT. In this context, the IT unit is not only tasked with defining and implementing standards for infrastructure and technologies: instead, its work increasingly involves the joint development and provisioning of platforms to be used as springboards for future innovations.

As a corollary of the greater integration of CIOs into the company’s core business, they are expected to do more than direct the standardized and planned rollout of systems and components. Especially in the early phases of brainstorming and development, a world undergoing such rapid change requires methods and processes with the agility and flexibility shown by “rapid prototyping” or “need finding”¹¹ (cf. Vetterli et al. 2011). Often, situations arise in which there is a lack of knowledge about the requirements for new software systems, infrastructure or business models. Conventional IT methods for development and planning are overburdened by this task. Successful projects at the University of St. Gallen’s Institute of Information Management with companies such as SAP, Audi, FIFA, Swisscom and Clariant have shown how new methodological approaches such as

¹⁰ Leading retail multinational. The interview was conducted in summer 2012.

¹¹ Need finding is a method for analyzing customer requirements and its development has been pursued primarily at the University of Stanford.

“design thinking” can help IT and business departments gain customer proximity while becoming more flexible and more agile.¹² Deutsche Bank has even gone a step further: design thinking has been an integral and successful part of the company since 2009¹³ (cf. Vetterli et al. 2012). Design thinking and similar methods are also associated with a change in the approach taken to decision-making. The familiar “top-down” style of decision-making in companies is replaced by a customer-focused decision-making process. New solutions and products are presented in short, iterative cycles to customers, whose feedback is used as the criterion for deciding whether to proceed with the solution. Simultaneously, however, this kind of approach ushers in momentous cultural change for both management staff and employees. Permission to fail must be granted in line with the principle of “fail often and early in order to succeed sooner”, so as to free up the idea process, offer room to innovate and engage in the occasional wild goose chase. In the final analysis, implementation of these paradigms leads to an organization driven by need and effectiveness, whose overarching goal is customer utility. Boundaries between IT and core business grow diffuse or disappear entirely.

The CIO’s conflict results from the combination of his or her existing and future tasks, as one set of duties focuses on safeguarding IT operations in all of its manifold forms, such as costs, avoidance of downtime (quality), optimized business processes, security and global aspects, while the other works to ensure integration into the company-wide process of innovation and development for new products, services and business models.

According to the latest IT trend report from Capgemini, the trend is clear (cf. Capgemini 2012): CIOs see their future role more as the business partner and technical innovator. The existing image of the service provider and business processes optimizer seems to have had its day. *“I’m stepping on the gas over there [in innovation work], without slowing down over here [in IT operations]”*, was one CIO’s take on the situation.

2.4.1.1 Challenges in IT Operations

Cost Optimization and Standardization There has been no let-up in the need for continuous optimization of cost structures within IT over the last few years. In fact, the opposite is true: the growing uncertainty within global markets is exerting greater pressure on IT to reduce the costs of operating the company’s IT systems (cf. Capgemini 2012). One viable instrument here is to standardize the core processes within IT and the technologies used by business. This was summarized by the CIO of a car maker as follows: *“Everyone has to follow set processes, methods and standards.”*

In addition, continuous optimization is also viewed as a “cleanup process”. While routine activities such as the consolidation of application environments are

¹² See <http://www.dthsg.com>

¹³ Design Thinking —The Value to the Company; see Deutsche Bank Group YouTube channel <http://www.youtube.com/watch?v=ZIKMZ7c5L0I>

well underway, these are nowhere near complete and require a major commitment of resources. “We currently run 4,600 applications and we want to further reduce this volume”, was the recent comment of a CIO from a leading chemicals company. This not only enables IT units to reduce their costs, but to establish a clear starting point for agility and flexibility, and thus the integration of new (mobile) applications into the existing IT environment. Opposing these efforts are company acquisitions or the implementation of applications with the help of new technologies, which act to reduce the degree of standardization.

Quality and Security Ensuring quality and security are two core competencies now expected to be demonstrated by a good CIO. “If you’re not performing your core duties, you’re not doing a good job”, reports a CIO working in the automotive sector. These include both the stability of IT operations as well as the development of high-quality application systems in accordance with customer requirements. Requirements stemming from new and more stringent legal frameworks—such as in banking—must be implemented with particular speed and precision, and are currently generating new challenges for IT organizations.

Global and International Aspects At the operational level, a further challenge has arisen in recent years, namely the IT unit’s ability to ensure worldwide delivery (cf. Zelt et al. 2013). Due to the dismantling of legal and economic barriers, company production and development sites are now distributed all over the planet. This development has been promoted by the IT industry itself. IT services must be provided worldwide to the business departments in a standardized, cost-effective way. In the process, a trade-off must be made between global standardization and local flexibility in the respective markets (cf. Zelt et al. 2013). The contours of this boundary between flexibility and a global standard will differ for each industry. Then again, globalization within the IT industry means that the selection and management of service providers must also be conducted internationally. Ultimately, this means establishing and operating processes capable of facilitating worldwide procurement.

Sourcing Outsourcing information technology to IT service organizations or IT service providers has a long tradition and has attained an advanced stage of development, at least in terms of core infrastructure services (cf. Brenner et al. 2012). Various models, such as the buy-in of individual personnel resources (especially in development) through to the tendering of complete projects or the purchasing of infrastructure according to units of consumption can be found within the market. The dominant trend in the market is in the direction of performance contracting, i.e. procurement no longer focuses on individual resources—such as servers or licenses—but on the output of these resources. For CIOs, the key challenge is to ensure a flexible and dynamic approach to managing the remaining in-house activity of their IT units. This management is necessary, since, depending on the company’s current situation, a relatively low or high share of sourcing is advisable. Companies with a lower degree of sourcing typically attempt to modify

their IT more rapidly to new circumstances, while, in contrast, companies with a higher degree of sourcing aim to ensure the greatest freedom of movement for innovation projects by the delegation of routine activities. We observe that CIOs' expectations regarding external service providers are also increasing in terms of their abilities to contribute to the innovation process. One insurance CIO describes the following core challenge in sourcing: "*How can we guarantee the pursuit of innovation in our outsourced units?*"

2.4.1.2 Challenges for Innovation

Agility and Speed One CIO described the phenomena mentioned with the phrase "IT of two speeds". This refers to the fact that CIOs are increasingly being asked to produce (and then operate) ready-to-run software capable of implementing business requirements in just a few weeks. Conventional methods for software development—and for operations alike—appear unsuited to these requirements. One topic repeated in many of our interviews was that traditional bureaucratic processes are well-suited to standard requirements, but are a poor match for a fast-moving, agile world. That applies both to software development and to IT operations, which in many of its task areas often requires more than 20 working days to provision the requested infrastructure. Above and beyond this, the software frameworks themselves must also be able to connect to new software products via standardized and modular interfaces.

Products, Services and Business Models "*Innovation is a sensitive plant.*" This description of the status quo by an insurance CIO applies to many IT organizations. The transition from a data center operator and service provider to a business partner engaged at the level of corporate management for product, service and business model innovation is a long and stony path. Often, CIOs lack the authority to originate innovation, even as it gradually dawns on the business world that IT is a critical element for success in almost all industries—a fact not merely important today but likely to be even more so in the future (cf. Brenner and Witte 2007). Accordingly, the key challenge faced by CIOs pursuing change will be to obtain the legitimation that permits them to make a valuable contribution to core business.

2.4.2 The CIO's Scope of Duties

As the previous sections have shown, the successful CIO of the future will be expected to master and cross-connect a wide range of competencies. Then again, the complexity of the CIO's job profile—at the nexus of innovation and IT operations—necessarily means that most CIOs will find the simultaneous fulfillment of all duties impossible, due to conflicts of interest. To be effective, managers must be able to "change their hats" depending on the specific situation prevailing at the company and flexibly refocus their activities. Both internal and external factors

are responsible for this positioning. By 2007, it had already been clearly shown that the role of the CIO would be split into two “camps” (cf. Brenner and Witte 2007). First, the “Designers”, who primarily seek a way into business and actively engage in innovations related to the portfolio and the company’s business model. Second, the “Chief Technology Officers”, who concentrate on the efficient and effective operation of production resources. One should emphasize that a drawing-down of the scope of duties is not to be equated with a curtailment in the sphere of responsibilities.

Responsibility for IT Operations *“In an IT unit operating worldwide, tasks need to be completed rapidly, at high quality and at low cost.”*¹⁴ Reliability and a high level of quality continue to be of paramount importance in IT operations, a situation justified not least by the critical dependence of the business on IT. Responsibility for this area encompasses not only the safeguarding of stability and security, but also the ability to scale IT operations to match the growing needs of the business and the demands of its customers. This also includes the management of subcontractors supplying IT services, as well as process services (business process outsourcing) and back office processes. Beyond this, new significance has been given to the management of IT employee training profiles within IT operations. Emerging technologies require proactive re-skilling and continuous professional development.

Managing IT at a qualitatively optimum level requires standardization, formalization and an optimized division of work in the unit’s strongly repetitive areas. Supplementing the well-established ITIL framework (IT Infrastructure Library), guidance can be found in the form of popular standards such as COBIT (Control Objectives for Information and Related Technology) or the eTOM framework (Enhanced Telecom Operations Map) originating from the telecommunications industry.

Interviewed in 2006, Rainer Janßen, CIO at Munich Re, stated: *“First and foremost, the basic expectation [on the part of business] is that things run smoothly.”* That is, responsibility for IT operations cannot be delegated, while actual execution can. Accordingly, the same standards also apply to external IT service organizations. Comparable to Maslow’s hierarchy of needs, the “hygienic factors” relating to basic, existential and security needs on the part of both the business and its customers must be supplied by IT. Only the satisfactory completion of these tasks establishes a position from which the CIO can actively engage with responsibilities and tasks as a technology adviser or innovator.

Responsibility as Technology Adviser As a technology adviser, the CIO has a high level of technological expertise in all matters relating to IT. Aided by highly persuasive communications skills, s/he is capable of maintaining networks both within his or her own company and externally to suppliers—to technology suppliers in particular. Empowered by his or her personal technological know-how, this role

¹⁴ Statement made during a 2012 interview with an insurance CIO.

enables the CIO to help incorporate market developments and trends into IT and business strategies at an early stage.

Responsibility as Process Specialist The CIO is generally accorded the process specialist title *per se*, due to the historical development of the role. Many corporate processes are now digitalized and mapped out within application systems. The transformation of these processes into the world of IT—not forgetting process operations themselves—normally means the CIO is the person responsible for process operation and design. This task is associated with a profound knowledge of the company’s various business units, i.e. “vertical knowledge”, and the markets it targets—knowledge that may first need to be acquired, depending on the CIO’s skill profile. This acquisition requires the CIO to be fully integrated into the company, both organizationally and in terms of personal networks. Closely associated with process operation and transformation is the capability to change these same processes. This not only assigns the process specialist the responsibility for mapping out processes and managing their operations, but also for process optimization, in the form of business process re-engineering.

Responsibility as Innovator The search for new—for “real”—innovations, is something that does not come naturally to the majority of CIOs, at least if the series of personal interviews we conducted with managers can be taken as representative. On the contrary: the path from simply feeling like an innovator to actually achieving innovation is a long one for most people and companies alike. From the authors’ point of view, the commonest fallacy among CIOs is to equate—and thereby confuse—the identification of new technologies in the market with innovation itself. The identification and systematic exploration of technologies (“trend and technology monitoring”) naturally forms part of innovation. But it is indeed only a part of the process. In addition, the CIO as innovator must create the right working atmosphere for employees. Alongside a suitable working environment, such as facilities, equipment, etc., this also includes an optimum workplace culture and agreed working conditions that stimulate employees’ creative and conceptual freedom. One management paradigm we might mention would be “fail often and early”, which means promoting a culture of tolerating error in the workforce, so as to identify and embark on new approaches in development and research processes as early as possible. Beyond this, the CIO also bears responsibility for establishing agile and iterative working processes informed by prototypes. Only the direct contact with customers and team-based collaboration with employees from the business units can guarantee the necessary diversity of novel perceptions required to develop new IT-driven products, service portfolios and business models. One characteristic typical of this breed of CIO is the capacity to consciously view unexpected interim project results not as destructive or a hazard in the sense of a project risk, but instead as an opportunity to discover or create something new.

To summarize, we may state that the scope of duties and sphere of responsibilities assigned to the CIO have both seen considerable expansion and are now oriented more towards customers and the business. Alongside purely

operational responsibilities, CIOs are expected to contribute actively to change in core business. The authors firmly believe that only a small proportion of management staff will be capable of leveraging their existing teams to fulfill this weighty portfolio of duties (IT operations, technology adviser, process specialist and innovator) at the level of quality both necessary and expected to satisfy the discussed challenges. Accordingly, this situation generates major potential for providers of IT services to extend the value chain as guarantors of effective and efficient task completion.

2.5 Positioning IT Service Organizations

How can IT service organizations and IT service providers position themselves effectively in the IT sector's dynamic market environment—with its complex requirements for operations and application system development? What are the critical factors for success that result from the company's strategy in each case? Our reply to these two questions will certainly not involve locating a universal answer, and will need to be contextualized in terms of the organization in question. That said, it is possible to derive two generic and textbook strategy models for IT service organizations from the contemporary and future positioning of IT organizations and CIOs. The basis is formed by the numerous interviews conducted with CIOs in recent months. The CIO support service model certainly appears to offer providers tremendous scope, with professionalism, quality and subject expertise all being in great demand.

2.5.1 Strategies for IT Service Providers

2.5.1.1 Strategy A: Business Partner

The "Business Partner" strategy positions the IT service provider as a partner for the CIO in all of the latter's task areas, and encompasses not only IT operations but also the fields of development and innovation. This strategy is based on a definition of the value contribution that goes beyond traditional parameters for IT service providers. That is: negotiations with the customer are not oriented exclusively on costs, production quality and security, but also incorporate qualitative aspects and expertise relevant to the industry in question.

If we look at the IT market of recent years, we see a vacuum developing between IT organizations and providers of infrastructure-like IT services. Infrastructure providers are engaged in the large-scale standardization of servers, networks, databases, and so on. The goal is to maximize economies of scale while achieving cost optimization to a degree that cannot be accomplished at the orders of magnitude found in conventional IT organizations. This objective consciously dispenses with the establishment of industry-specific expertise, however, and offers no direct knowledge of specific markets, such as the insurance sector. The strategy adopted by Amazon, Salesforce.com, etc. consciously attempts to minimize relevance for

any one industry, so as to ensure portfolio complexity remains manageable, and thus sustain their hard-won responsiveness, agility and cost leadership.

On the other hand, both IT organizations and the role of the CIO are currently in transition, as has been touched on in previous sections. Both business and customers are demanding new (mobile) application systems, including rapid turn-around and integration into existing infrastructure. This is accompanied by the need to establish IT platforms able to handle entire value chains—such as the energy or automotive sectors (see car sharing)—so as to offer customers new services based on integrated data repositories.

This is the environment in which the authors see major potential for IT service organizations to position themselves in the vacuum between these two poles. These organizations would have an opportunity to partner with CIOs in a particular value chain in the shared design, setup and operation of new platforms offering integration and market potential. In terms of perspective, IT service organizations would no longer focus exclusively on the technological aspects of networks and servers, but on the core business of the customer organization. IT service organizations could offer their expertise to each and every member in the value chain, thus facilitating new platforms for the energy industry or in car sharing for the automotive sector, for example. In the final analysis, however, this does mean that IT service providers need to engage with the customer's market, business processes and technologies at a fundamental level: only in this way can they even begin to support CIOs with innovative proposals of their own. Acceptance into the CIO peer group is not achieved merely by the simple operation of high-quality cloud services.

This positioning strategy will first require sweeping changes to be made at some IT service providers, however—not only in terms of providing basic and further training for the company's own workforce (e.g. to develop specific industry expertise) but as regards implementing structures and processes of far greater agility and innovative focus. Performance parameters traditional to the IT service provider sector (i.e. costs, security and quality) naturally retain their validity for IT organizations—although their relative importance in evaluating IT service providers decreases.

The authors firmly believe that the companies who navigate this transition will be offered opportunities to work in partnership with CIOs in the future and to support them in many different ways. Inevitably, this would be linked to a shift in the business model to one that is no longer focused exclusively on cost/price reduction and standardization, but which looks beyond this to place industry know-how and market expertise center-stage.

2.5.1.2 Strategy B: IT Operations/Development Partner

The "IT Operations/Development Partner" strategy is based on the establishment of cost efficiency, economies of scale, standardization, global availability/delivery capability and production quality. From the perspective of tomorrow's CIOs, IT service providers adopting this strategy acknowledge they will be benchmarked directly against current industry titans like Amazon, Google or IBM. Achieving

vast economies of scale is the primary objective here, as mentioned in the introductory sections.

Once achieved, these economies of scale automatically amplify the degree of IT production automation and industrialization in several dimensions. As early as 2007–2008, joint research work carried out between the University of St. Gallen's Institute of Information Management and T-Systems International had already demonstrated that ERP-like systems are capable of end-to-end automation of IT service production (cf. Ebert et al. 2008): from the initial design of the IT service portfolio to IT service consumption with the aid of self-service portals and the delivery and operation of the IT service for the customer, including the provision of continuous monitoring and quality assurance services. At the time, it was possible to reduce the window required for provisioning IT services and bringing them online from several days to just a few hours. One key insight here was that core business was now focused on the configuration of standard services instead of the customization of IT services: accordingly, standardization needed to be increased across the board (cf. Brocke et al. 2011; Dudek et al. 2011). In action behind the scenes is the principle we espoused as early as 2004, namely end-to-end process optimization and industrialized information management, combined with a systematic focus on customer needs. The starting-point for this work comprised parallels drawn with traditional industry. In the current analysis, the textbook example of this strategy is Amazon's S3 service. Within just a few minutes, highly-redundant storage space is both configured and available. This has been facilitated by the setup of highly-available "IT factories", i.e. IT production facilities featuring almost 100 % standardization.

Comparable requirements are being demanded of software development teams in terms of their division of labor and internationality. IT service providers operating internationally maintain development centers worldwide: this permits them to leverage local cost benefits while also exploiting regional differences—in Asia or South America, for example—in adapting the design of application systems.

For most IT service providers, the only viable option now available is the "me too" strategy—i.e. copycat models that mimic the activities of the undisputed market leaders. Efforts to innovate at such companies often have a strong technological bias: the aim is rapid service provision at the best possible price point and for a wide range of application scenarios, while also generating a high degree of scalability in their infrastructure. Work focuses on unrelenting optimization of cost structures by adopting a dual strategy of radical growth of the customer base combined with the continuous improvement and automation of internal processes.

Companies adopting this strategy handle the completion of core tasks for IT organizations and CIOs in terms of IT operations and development work. The generalized nature of the services provided does lead to a certain "interchangeability" among providers, however. In addition, IT service providers in this market are being confronted with increasingly tough competition on a global scale: ultimately, the size of the company will be decisive in determining the victors.

2.5.2 Critical Success Factors for IT Service Organizations

The most important factors for success in the case of the two strategies described—in their idealized, textbook forms—are derived from the discussions in this section and are summarized definitively in Table 2.1.

The Ability to Innovate The ability to deliver a continuous stream of innovations for the CIO is central to both model strategies. There are practical differences, however. While technological innovations will suffice in meeting the expectations of the CIO in Strategy B, companies following Strategy A will also be expected to make contributions to innovations affecting the business model, products and services—both in terms of core company business and the respective value chain. Companies in the Strategy A group must therefore seek to prepare and train their employees for the forthcoming transition as early as possible while also establishing business competency. Meeting the challenges of the ability to innovate will require changes to the style and structure of management, and to its methodological toolbox. The guiding principle for these companies is simple: “Innovation is not a game!”

Customer- and Market-specific Business Know-how In many cases, the CIO will accept or reject IT service organizations based on their knowledge of business-relevant topics. Strategy A requires a high degree of engagement with market circumstances and mechanisms of action along the entire value chain. For the CIO, the service organization’s contributions must be specialized to have any value. For Strategy B companies, this kind of specific expertise is not required. Such IT service providers only need to provide sufficient know-how for preparing the company’s business portfolio to handle future change.

Customer Focus For Strategy B, customer focus involves aligning the IT service portfolio and IT production in general as closely as possible with the needs of the customer. End-to-end orientation of organizational processes on the customer also applies in the case of both model strategies.

Global Delivery Capability IT service providers of the future must be capable of offering IT service provision worldwide at the same high level of service quality. This factor for success applies equally to both model strategies. Practical implementation is likely to differ in each case, however. Group A companies can leverage partner models (for example) to supplement their own, globally-distributed infrastructure.

Product and Service Quality As is the case today, the assurance of product and service quality will continue to be a fundamental entry barrier to the provision of IT services. Regardless of the strategy model they adopt, companies who struggle to orchestrate their processes and procedures or are unable to supply quality to the required standard will face difficulties in gaining market acceptance.

Table 2.1 Critical success factors for IT service organizations

Success factors	Strategy A: business partner	Strategy B: IT operations/ development partner
Ability to innovate	CIOs expect technological innovation to be matched by the achievement of innovations in business, products and services	Focus on the generation of technological innovations and their optimum deployment
Business know-how specific to the customer and market	Mandatory, to enable participation on innovative brainstorming within the CIO peer group	Important, to be able to define market-specific offers and architecture based on standard services
Customer focus	Customer focus means having an empathic understanding of the challenges facing the customer organization in its markets, and responding with both standard and tailor-made services	Aligning standardized IT services with the needs of the customer
Global delivery capability	Global delivery capability is a key requirement for working with major clients	
Product and service quality	Maximum compliance with security and availability requirements in the relevant IT service categories	
Cost leadership	Transparent price/cost structures	The objective is to achieve cost leadership

Cost Leadership The success factor of cost leadership is primarily a factor for companies following the Strategy B model. Due to increasing cost pressures in the market and the fact that IT service quality has now been harmonized at the highest possible level among the market's biggest players, cost leadership will constitute a key criterion for customer organizations in the IT service organization selection process. IT service organizations must respond by achieving major economies of scale and widespread automation.

2.6 Summary

In authoring this chapter, our aim was to isolate and discuss the success factors applicable to IT service organizations. At the outset, we considered the general market situation in the IT sector and a number of trends, such as greater customer proximity and advances in technological developments. Working from this analysis, and incorporating a total of 50 interviews with CIOs and senior management, we then sketched out the implications for a new CIO role in IT organizations. The result is a palpable expansion of both the CIO's responsibilities and duties in terms of business and the customer. Our discussion has also shown the great potential offered to IT service organizations by the market of the future. Section 2.5 of this article then sketched out two generic model strategies: (1) Strategy A, the "Business Partner" and (2) Strategy B, the "IT Operations/Development Partner". Strategy A empowers companies to engage in fields of business that are new to IT service

providers. This option requires an immense commitment of resources, however, to acquire the necessary business expertise and establish the “authority to innovate” vis-à-vis CIOs. Due to a simple lack of resources, many companies are likely to focus on specific industries. IT service organizations that pursue Strategy B are entering a global competition that will be decided by sheer size and cost efficiency. The standard for success here is the ultra-integrated value chain as established by industry titans like IBM, HP, and others. The outcome of this competition will affect both traditional IT service provision and new services provided from the cloud computing sector. We also described six critical factors for success that support these two strategies and are decisive for business success: the ability to innovate, customer- and market-specific business know-how, customer focus, global delivery capability, product and service quality, and cost leadership.

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<http://www.springer.com/978-3-642-40218-0>

The Road to a Modern IT Factory
Industrialization - Automation - Optimization
Abolhassan, F. (Ed.)
2014, XX, 210 p. 61 illus., Hardcover
ISBN: 978-3-642-40218-0