The Emergence of Chief Digital Officers

Embracing the opportunities presented by new digital technologies is one of the most urgent challenges companies face today. Yet, 63% of executives and managers find that “the pace of technology change in their organization is too slow.” Companies obviously need to address this issue.

Until recently, chief information officers (CIOs) were mainly held responsible for digital innovation. For several years, companies have expected their CIOs to extend their roles from pure technologists to business strategists. This means they need “to spend less time managing IT services and more time delivering broader business value. If they don’t, CEOs may appoint other executives to drive that value.” These new responsibilities have been placing pressures on CIOs, and many have had difficulties in embracing them.

To identify the reasons for these difficulties, it’s necessary to examine the nature and purpose of digital transformation. A company undergoing a digital transformation uses new digital technologies such as social media, mobile access, analytics or embedded devices to enable major business improvements like enhancing customer experience, streamlining...
operations or creating new business models. The term "transformation" (as opposed to "change," for instance) expresses the comprehensiveness of the actions that need to be taken when organizations are faced with these new technologies. Thus, a digital transformation typically involves a company-wide digital (transformation) strategy, which goes beyond functional thinking and holistically addresses the opportunities and risks that originate from digital technologies. A digital transformation strategy guides the organization in its journey toward being digitally transformed.

The responsibilities associated with digital transformation have such a high level of complexity that it is immensely challenging for the CEO or just one senior executive to manage them in addition to his or her original responsibilities. For example, the original responsibilities of a CIO are to manage the operation of the IT infrastructure and the evolution of platforms. Digital transformation, however, goes beyond merely digitizing resources and results in value and revenues being created from digital assets. Moreover, new digital technologies “demand different mindsets and skill sets than previous waves of transformative technology,” which might be another reason why CIOs are often not necessarily best equipped to take charge of digital transformation.

Increasingly, companies are establishing an additional position at top management level: the chief digital officer (CDO). The CDO role can be centralized at the group level or decentralized at the subsidiary level. Regardless of positioning, CDOs are employed to make digital transformation a strategic priority in their companies. MTV Networks was the first to hire a CDO, back in 2005. Since then, the number of CDOs has roughly doubled each year. The CDO is one of the fastest-growing C-level positions, and although 88% of CDOs have been hired in the U.S., the role is a global phenomenon.

But what exactly do CDOs do, and how do they differ from their CxO colleagues? And is the CDO a temporary role that will disappear in the future? Although many CDO positions have already been established, there is still confusion about what exactly CDOs are expected to achieve and what their main responsibilities are. The purpose of this article is to provide answers to these questions. Companies need to understand the roles a CDO can play and the skills they should look for in a CDO. Based on six in-depth case studies, we identify the skills and characteristics a CDO should have and offer insights into how the CDO role is performed.

What Chief Digital Officers Are and What They Are Not

To understand the nature and role of CDO positions, it is necessary to distinguish the CDO from adjacent C-level executive positions that might at first glance have similar responsibilities—i.e., the CIO, chief data officer, chief innovation officer and chief strategy officer.

The most important distinction is between CDOs and CIOs. Unlike CIOs, who are the most senior IT executives in an organization, CDOs have no functional IT responsibility. Most often, they have no profit and loss responsibility, and their overall corporate perspective is broader than CIOs’ Even if a firm’s CIO does deliver digital business innovation and broader strategic business value, the CDO additionally focuses on fostering cross-functional collaboration, mobilizing the whole company across hierarchy levels and stimulating corporate action to digitally transform the whole company. While the CIO takes the role of the strategic IT specialist, the CDO is the company’s digital transformation specialist. This is the distinguishing factor between CDOs and CIOs: transformation is at the core of the CDO’s role, not a responsibility in addition to others.

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7 We use the terms “digital transformation strategy” and “digital strategy” synonymously in this article.
8 For an extensive account of digital transformation strategies and how companies can formulate them, see, e.g., Hess, T., Matt, C., Benlian, A. and Wiesböck, F. “Options for Formulating a Digital Transformation Strategy,” MIS Quarterly Executive (15:2), 2016, pp. 103-119.
10 Fitzgerald, M., Kruschwitz, N., Bonnet, D. and Welch, M., 2013, op. cit.
11 For the latest updates on CDO numbers, see http://cdoclub.com.
12 The Appendix describes the research methodology and the interviews conducted.
13 In some companies, the most senior IT position might be labelled differently, e.g., Chief Technology Officer or Head of IT. We use the term “CIO” to cover all these titles.
CDOs also differ from chief data officers, who are their organizations’ data specialists, focusing on data management and data analytics. Chief data officers put data on the business agenda and, instead of treating data merely as a by-product of running the business, they devise strategies for exploiting the business's data. Chief data officers thus focus on just one organizational capability within the digital realm: big data. Although big data obviously also plays a role in the work of CDOs, the scope of the CDO role is much broader and not confined to this one specific area of digital transformation.

Even though CDOs' responsibilities include digital innovation, they do not replace chief innovation officers, who are the corporate innovation specialists and who lead an organization’s broader innovation efforts. Chief innovation officers create an environment that fosters innovation and provides the organizational structure to support the development of new products and services. Their role involves exploiting ideas from both internal and external sources, for instance in the form of crowdsourcing and cross-company collaboration. As such, the underlying goals of CDOs and chief innovation officers are different. The latter redefine technologies, company structures and day-to-day practices, without having a dedicated digital focus, while CDOs focus on the digital overhaul of the whole company.

Obviously, digital transformation has strategic importance for a company. Typically, a company’s chief strategy officer (CSO) focuses on strategic issues and acts as the corporate strategist. But the CSO doesn’t have a specific focus on digital transformation. A CSO typically lacks both the specialized knowledge about digital business models and the experience to handle projects in this field. These tasks are the responsibility of the CDO.

### Definition of the CDO Role
To clearly distinguish CDOs from these other C-level executives, we offer the following description of the CDO role: The CDO orchestrates the digital transformation of a company. The CDO role thus includes supporting top management in formulating and executing a dedicated digital transformation strategy. By stimulating and leading corporate action, the CDO embraces the full spectrum of opportunities presented by new digital technologies and thus aims to bring the company to the forefront of the digital evolution taking place. Internally, the CDO fosters cross-functional collaboration and mobilizes the whole company across hierarchy levels. It is important to recognize that CDOs have a wider role than heads of individual digital business units; CDOs assume cross-department authority for digital initiatives and aim to transform the company as a whole.

Table 1 summarizes the key responsibilities, strategic perspectives and strategic roles of CDOs and the related C-level positions. Keeping the differences in mind is important for a full understanding of what the CDO role entails.

### Six Cases Illustrating the CDO Role
In the following sections, we describe the experiences of six companies that employ a CDO to illustrate how CDOs perform their roles in a range of industries (retail, tourism, education, market research, financial services and publishing). Table 2 provides an overview of the six cases.

#### Case 1: A CDO in the Retail Industry
With turnover in the range of €20 to €30 billion, with 60,000 to 70,000 employees, Case 1 is the largest retailer in Europe within its business sector. The company operates in 15 countries, and the CDO, along with the CIO, is employed at corporate group level.

### Scope of the Digital Transformation
The digital transformation has three major components:

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18 As of January 2017, €1 = $1.05.
Table 1: Comparison of CDO and Other CxO Positions

<table>
<thead>
<tr>
<th>Key Responsibilities</th>
<th>Chief Digital Officer</th>
<th>Chief Information Officer</th>
<th>Chief Data Officer</th>
<th>Chief Innovation Officer</th>
<th>Chief Strategy Officer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Digital mobilization of whole company</td>
<td>Strategic IT deployment</td>
<td>Data management</td>
<td>Structured corporate innovation</td>
<td>Management of strategy process</td>
</tr>
<tr>
<td></td>
<td>Initiation of digital initiatives</td>
<td>IT support</td>
<td>Data analytics</td>
<td>No specific focus on digital initiatives</td>
<td>Strategy execution</td>
</tr>
<tr>
<td></td>
<td>Company-wide collaboration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Perspective</td>
<td>Digital Transformation Strategy</td>
<td>IT Strategy</td>
<td>Data Strategy</td>
<td>Innovation Strategy</td>
<td>Corporate Strategy</td>
</tr>
<tr>
<td>Specialist Role</td>
<td>Digital Transformation Specialist</td>
<td>Strategic IT Specialist</td>
<td>Data Specialist</td>
<td>Corporate Innovation Specialist</td>
<td>Corporate Strategist</td>
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<td></td>
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</tbody>
</table>

1. **Customer experience enhancement**: An omni-channel strategy that involves the creation of a seamless customer experience across all touch points.

2. **Business operations**: Focusing on (in the CDO’s words) “efficiency through automation” to gain more time for enhancing the customer experience.

3. **New business opportunities**: Monitoring potential business opportunities created through the use of digital technologies.

**Reason for Creating the CDO Role.** According to the CDO, he was employed to transform the company toward a “digitally empowered and customer driven” organization. His mandate is to use state-of-the-art technologies to make the company more efficient and to offer customers personalized experiences.

**Positioning of the CDO and CIO.** Both the CDO and CIO report directly to the CEO, who is also personally involved in the digital transformation efforts. The CDO and CIO participate in the fortnightly strategic board meetings, thus demonstrating the close working relationships between the CDO, CIO and CEO.

**CDO Tasks.** The CDO defines the digital strategy and is responsible for digital innovation across the group. He uses new digital technologies to enhance the customer experience across all customer touch points and fully integrate the offline and online points of sale. Examples include cross-device online shopping carts and smartphone apps with integrated state-of-the-art technology, such as location-based services and augmented reality. By equipping the retail stores with tablet PCs, he enables the sales employees to quickly retrieve data and respond better to customers' needs.

To continuously keep track of emerging opportunities, the CDO constantly monitors digital trends and digitally savvy start-up companies. His trial-and-error culture means that he can try out new developments to see if they are appropriate for adoption. Although the CDO has a dedicated budget, he has no profit responsibility; such responsibility might hinder his ability to innovate.
The CDO works closely with operational colleagues, develops ideas in cooperation with the company’s subsidiaries and conducts pilot projects. If proof-of-concepts are successful, they are rolled out across other subsidiaries. As part of his role in fostering company-wide collaboration and the exchange of ideas, the CDO initiated an annual Digital Campus for the group and all its subsidiaries. At these events, successful digital initiatives are presented to participants and they can experience new technologies hands-on.

**Cooperation with the CIO.** The CDO and CIO work closely together. In our interviews, both confirmed that the CDO is mainly responsible for the conception and planning of the digital transformation, whereas the CIO is mainly responsible for implementing the corresponding IT solutions.

**Case 2: A CDO in the Tourism Industry**

This company is a national subsidiary of one of the largest global travel companies. The subsidiary has a turnover in the range of €1 to €5 billion, with 1,000 to 5,000 employees, and has its own CIO. The CDO we interviewed has counterparts in other group subsidiaries.

**Scope of the Digital Transformation.** Originally, the company had a very traditional business model: it assembled travel packages, which were then sold via travel agencies. It did not have any direct interaction with customers. Today, however, growth in the travel business is driven by pure-play online platforms. When the company decided to employ a CDO, its online market share was only 4%. Although it had a subsidiary that was responsible for all of its digital business, the digital activities were characterized by a marked silo mentality because they were decoupled from the core business. The digital transformation now underway will remove the organizational silos by bundling all digital activities together and transforming the whole organization to become a more customer-centric, digitally savvy enterprise.

**Reason for Creating the CDO Role.** A dedicated CDO position was created to proactively drive the company’s digital transformation and be the driving force behind the new digital initiatives.

**Positioning of the CDO and CIO.** The CDO and CIO report directly to the subsidiary’s CEO. As the CDO noted, it is critical to her success that the

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**Table 2: Overview of the Six Case Organizations**

<table>
<thead>
<tr>
<th>Case</th>
<th>Industry</th>
<th>Annual Revenues (€) per Year (a)</th>
<th>Employees</th>
<th>Positioning of the CDO</th>
<th>Most Senior IT Executive</th>
<th>Chief Strategy Officer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Retail</td>
<td>20-30bn.</td>
<td>60-70K</td>
<td>Group</td>
<td>CIO</td>
<td>• Oct. 2015 (CDO)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Nov. 2015 (CIO)</td>
</tr>
<tr>
<td>2</td>
<td>Tourism</td>
<td>1-5bn.</td>
<td>1-5K</td>
<td>Subsidiary</td>
<td>CIO</td>
<td>• March 2014 (CDO)</td>
</tr>
<tr>
<td>3</td>
<td>Education</td>
<td>500mn-1bn.</td>
<td>1-5K</td>
<td>Subsidiary</td>
<td>CIO</td>
<td>• April 2014 (CDO)</td>
</tr>
<tr>
<td>4</td>
<td>Market Research</td>
<td>100-250mn</td>
<td>500-1,000</td>
<td>Subsidiary</td>
<td>CIO</td>
<td>• Nov. 2015 (CDO) Dec. 2015 (CTO) Jan. 2016 (Managing Director)</td>
</tr>
<tr>
<td>5</td>
<td>Financial Services</td>
<td>100-250mn</td>
<td>500-1,000</td>
<td>Subsidiary</td>
<td>Head of IT</td>
<td>• Dec. 2015 (CDO) Dec. 2015 (Head of IT)</td>
</tr>
<tr>
<td>6</td>
<td>Publishing</td>
<td>1-100mn</td>
<td>100-500</td>
<td>Group</td>
<td>CDO (b)</td>
<td>• Jan. 2016 (CDO)</td>
</tr>
</tbody>
</table>

(a) The wide range of annual revenues and employees is deliberate to preserve the anonymity of the case organizations.

(b) In case 6, the same person holds both the CDO and CIO positions.
CEO supports her digital initiatives and that she can collaborate with the CIO, who implements the digital initiatives.

**CDO Tasks.** The CDO is tasked with creating a “360 degree” customer experience across all customer touch points and with massively growing the company’s online and mobile business. The CDO’s main focus is therefore on customer relationship, social media and multichannel management. Overall, her job is split 50/50 into digital strategy implementation and management of ongoing business operations. Initially, the CDO’s job consisted mainly of project-based work. After creating a digital growth strategy, she held many workshops, developed a business plan and a road map, and presented her concepts to the decision makers at the corporate holding company. When implementing the projects and programs, the CDO needed to mobilize the whole company (the subsidiary), particularly the project managers who were put in place. A corporate program was created to interlink all stakeholders, particularly decision makers involved in social media, customer relationship management, marketing and multichannel projects.

At the time we interviewed the CDO, a new sub-unit responsible specifically for digital media had already been created. However, the CDO told us that to achieve “one single view of a customer” and optimize the customer experience, customer data needed to be organized. Hence, the CDO initiated the creation of a master data management platform. This platform pools the various data sources and uses insights gained from the pooled data at the various customer touch points.

**Cooperation with the CIO.** The subsidiary’s CEO created the CDO and CIO positions at the same time, recognizing that both are needed to progress the digital transformation. The CDO develops IT requirements iteratively and in close collaboration with the CIO. But the CIO has full responsibility for implementing what has been defined.

**Case 3: A CDO in the Education Industry**

Case 3 is the global operating company of what was originally a traditional publishing house. It provides students, teachers and institutions with educational content, and has revenues in the range of €500 million to €1 billion, with 1,000 to 5,000 employees. The company is currently transforming itself from a pure print publisher to a “modern education company” that offers sophisticated e-learning courses. The CDO is employed at subsidiary level, while a CTO is employed at group level.

**Scope of the Digital Transformation.** While the company’s traditional business model was based on educational text books, the digital transformation will offer new opportunities in three areas:

1. **Adaptive learning:** Without a teacher who delivers course material, personalized online courses focus on each student’s individual weaknesses in an automated way.

2. **Efficacy management:** The effectiveness of an online course can be systematically evaluated because each student’s learning outcomes can be tracked and measured. Moreover, the company’s marketing and sales executives can use this information to promote the successes of their users.

3. **Data-driven publishing:** Because the efficacy of the online courses is directly measured, the need to rely on improvement suggestions from teachers becomes obsolete. Instead, decision making is informed purely by data analytics. Should most students of a cohort fail at certain sections of an online course, product developers can promptly publish an improved version.

**Reason for Creating the CDO Role.** The CDO told us that his position was created to transition the business from a “pure print publisher to a modern education company.” The primary role of the CDO is therefore to conceive new digital products and drive their implementation.

**Positioning of the CDO and Chief Technology Officer (CTO).** The CDO reports directly to the subsidiary’s CEO, while the CTO role is centralized at the group level.

**CDO Tasks.** Initially, the company had no plan for life after printed educational text books. The CDO therefore created a digital vision for the company, defined a cross-functional digital strategy and conceived new digital products.
How Chief Digital Officers Promote the Digital Transformation of their Companies

The CDO sees himself as a strategist rather than a technologist because he focuses primarily on digital product development that is based on current customer needs. He collaborates closely with development partners, who are potential customers, to better identify current customer needs and adjust product development accordingly.

However, highly interactive digital products like online courses cannot simply be created directly from traditional text books, because the interactions and activities involved with online courses need to be modelled on an IT platform. The CDO therefore initiated the implementation of the Learning Management System. Teachers are supposed to log on to this platform, assign tasks to students and track their progress. At the core of this company's digital strategy is the combination of digital content and data analytics. Data analytics techniques are used to measure the performance of students and teachers individually and, at an aggregated level, across classes.

The digital transformation is replacing printed books with sophisticated online courses as the company's core offering. The transformation requires product development to be redefined and expanded because the company now requires employees with completely new skills and capabilities. Many business functions have been affected by the process of creating online courses, which is why the CDO became involved in activities across business units and needed to spread information across the company to convince all decision makers of the need for digital transformation.

**Cooperation with the CTO.** Technology platforms are essential for the production and distribution of the online courses. The CDO collaborates with the corporate group's CTO on issues concerning the technology infrastructure, but it is the CTO who is responsible for implementing the digital initiatives. However, the CDO works closely with software developers during product implementation.

**Case 4: A CDO in the Market Research Industry**

Case 4 is a renowned market research and marketing consultancy with revenues in the range of €100 to €250 million, with 500 to 1,000 employees. The company offers business-to-business (B2B) services across industries, and its main customers are corporate market researchers and marketers. It has both a CDO and a CTO, and is a national subsidiary of one of the largest research agencies worldwide. Each national subsidiary has its own CDO.

**Scope of the Digital Transformation.** The digital transformation has two primary components:

1. **Technology-enabled research**, which focuses on optimizing customer solutions through integrating digital technologies. Traditionally, the company focused on the collection of primary data when conducting its market research, and its main capability was statistical analyses. With the emergence of data from social media and search engines, the company is increasingly supplementing, or even replacing, its primary data collection with data from these new sources. This new kind of data also enables the company to provide predictive modelling and generate early warning indicators.

2. **Integrated marketing**, which is based on new digital touch points, such as social media, that have been changing the marketing activities of its customers. The company is also adjusting its marketing consultancy services to take account of these new touch points.

**Reason for Creating the CDO Role.** The CDO was appointed to support and drive the above-mentioned digital transformation projects throughout the subsidiary and to consult the customer-facing managers.

**Positioning of the CDO and CTO.** The CDO and CTO both report directly to the CEO. They are also members of the company's highest-level strategy board, which focuses on digital transformation and is the forum where the CDO brings forward his ideas for discussion and decision taking.

**CDO Tasks.** To progress the company's digital journey and to raise awareness, the CDO regularly informs employees and managers about his current digital initiatives. At the employee level, he speaks at staff meetings; at the management level, he is involved in leadership town-hall
meetings. The CDO initiates new ideas and projects and gives fresh impetus to the company's digital transformation journey on an ongoing basis. For instance, he recently conducted a multinational study with a special focus on marketing and e-commerce to investigate customers' perspectives of digital transformation. The insights from this study serve as a decision-making tool and support the company in its consultancy activities.

In the area of technology-enabled research, the CDO addresses strategic questions concerning the use of data from social media and search engines—i.e., how the data can be incorporated into market research studies to offer true added value for customers. According to the CDO, "this is a cultural shift, which is at least such a daunting task as the technological shift" because customers often do not immediately understand the added value of the new solutions.

Cooperation with the CTO. Throughout the digital transformation journey, the CDO collaborates closely with the company's CTO. While, according to the CTO, the CDO "listens in to customer needs and takes these insights into the company," the CTO is responsible for implementing the digital projects.

Case 5: A CDO in the Financial Services Industry

Case 5 is the private banking subsidiary of the national branch of a European financial institution. The subsidiary generates revenues in the range of €100 to €250 million, with 500 to 1,000 employees. This company is at the very early stages of digital transformation and has appointed a CDO who leads the digital transformation unit jointly with the Head of IT.

Scope of the Digital Transformation. The private banking industry is highly conservative, with security and confidentiality being major concerns. The digital transformation is therefore proceeding with great caution and the company is, according to the CDO, "carefully innovative." As a consequence, the scope of the digital transformation currently focuses just on changing the internal mindset and introducing basic digital tools and devices.

Reason for Creating the CDO Role. The CDO position was initiated bottom-up by the now-CDO herself, who has been with the company for several years as an online communication specialist. When she had introduced the company's first online channels, she had collaborated closely with the Head of IT. Jointly, they put forward the idea of creating a Digital Office to take the business in a new direction and proactively drive digital initiatives throughout the business. Due to this bottom-up approach, however, no specific targets for digital transformation have, as yet, been set by top management.

Positioning of the CDO and Head of IT. The digital transformation is not yet on the agenda of the top management team. The Digital Office reports to the communication department, which, in turn, reports to the CEO. Thus, so far there has been no direct input from the top management team on the purpose and aims of digital transformation. As a consequence, it is the CDO and the Head of IT who play a focal role in progressing any digital initiatives brought forward.

CDO Tasks. The CDO's current priority is on changing the mindset within the top management team and among employees before being able to proceed with specific digital initiatives. In her own words, she tries "to offer new perspectives" and to establish a more proactive attitude within the company by illustrating the up-coming changes in the market and putting forward innovative solutions. To get a feel for the opportunities presented by digital transformation, the CDO conducted interviews with representatives of firms from different industries that were already at an advanced stage of their digital transformations. She then collated the insights gained from the survey into a digital strategy for her own company.

Although operating in a separate unit, the CDO works closely with different stakeholders, particularly with the internal communication department and the customer consultants. Since the CDO’s main goal is to offer customers a better service through the use of digital tools, the customer consultants have already been equipped with tablet computers. She also advises other company subsidiaries on their respective digital strategies.

Cooperation with the Head of IT. The CDO and the Head of IT work closely together to enable digital transformation. Having expertise
in complementary fields, they distribute their responsibilities accordingly: the Head of IT takes charge of technology, while the CDO is responsible for communicating the technology benefits across the company.

**Case 6: A CDO in the Publishing Industry**

This company is an international publishing group with 100 to 500 employees and a focus on specialist psychological books and trade journals. It also provides testing systems for psychological diagnostics. The company has revenues in the range of €1 million to €100 million. The CDO, who is also the CIO, is employed at corporate group level.

**Scope of the Digital Transformation.** The digital transformation comprises four strategic initiatives:

1. *E-assessment*, which focuses on digitizing the company's psychological testing diagnostics
2. *One portal*, which bundles together content, databases and interactive products, and tailors the bundles to customer needs
3. *One web*, which is aimed at increasing the volume and efficiency of the company's e-commerce business
4. *One IT*, which deals with infrastructure and workplace IT and focuses on a common group infrastructure and common tools for communicating and cooperating more efficiently.

**Reason for Creating the CDO Role.** The CDO position was created to increase revenues from digital products. The CDO is also the CIO and is therefore also responsible for the IT infrastructure and for implementing IT-enabled business processes and applications aimed at enhancing process efficiency. It is important to note, however, that the CDO in this company clearly distanced himself from the "typical CDO." He stated that usually the CDO and CIO coexist, with the CIO servicing infrastructure and applications, and the CDO contributing to a strong customer perspective of the digital transformation.

**Positioning of CDO.** Because the digital transformation is on the strategic agenda of the top management team, the CDO reports directly to the group CEO. The CDO has the explicit task of informing and consulting the top management team, so he has a close relationship with the CEO. He is part of the group’s strategic board, which involves regular meetings with the top management team and fosters close collaboration.

**CDO Tasks.** The CDO defines and implements the company’s overall e-business strategy. His tasks involve advising the top management team, managing the digital business models and digital product development, and supporting and coordinating the organizational units in specific digital initiatives. His tasks are cross-functional, encompassing the product, e-commerce, IT and online marketing units. Hence, disseminating information and mobilizing employees are high on his agenda.

At the top management level, the CDO disseminates business-critical information across the publishing group and informs top management on current trends and developments in the market. He says his role here is to "show and make plausible how fundamental the digital transformation is and how much the company's current business models are threatened if no actions are taken." At the employee level, the CDO organizes workshops and training sessions to inform about the digital strategy and the progress of its implementation, and to train employees.

The CDO works at both the operational and strategic levels. He spends one-third of his time on communicating and exchanging ideas with the company’s subsidiaries. He incorporates good ideas into the group strategy and manages the strategy implementation programs. He spends the rest of his time in steering committees or working on specific projects as a project sponsor.

**Summary of the Six Cases**

Table 3 summarizes the six cases in terms of the focus of the digital transformation, the task focus of the CDO and the relationship between the CDO and the most senior IT executive.

**The Three Role Types of CDOs**

Although the CDOs in the six case companies operate in diverse industries and companies,
we were able to identify three main types of roles they play—the Entrepreneur, the Digital Evangelist and the cross-functional Coordinator.

### The Entrepreneur Role

We observed a lot of entrepreneurial spirit in the CDOs across the cases. As the CIO in Case 1 put it: “Our CDO is kind of an innovator, thought leader and consultant for our top management,” Entrepreneur CDOs explore IT-enabled innovations, establish a digital transformation strategy and help their companies innovate through the use of new digital technologies. They initiate and design the controlled shift of their companies toward becoming digitally empowered organizations that strategically exploit the opportunities presented by new digital technologies. These CDOs point the way for their companies in a fast-paced technological environment and sometimes even adapt whole business models. Their responsiveness to the market is of particular importance in this context, which is why Entrepreneur CDOs have a strong customer focus.

### The Digital Evangelist Role

The managing director in Case 4 described his CDO as “… the supreme evangelist. It is his task to inspire the people in the organization and to get them enthusiastic about digital topics.” To successfully inspire people, a corporate culture shift is usually needed because the traditional way of doing business is deeply entrenched in managers and employees. A crucial part of the Digital Evangelist’s job is therefore to convince the workforce across all departments and hierarchy levels to pull together. In the words of the CDO in Case 5, “CDOs need to offer new perspectives … and educate people to look and think ahead.” As Digital Evangelists, CDOs communicate their digital strategies across their companies...
and across departmental boundaries to ensure the whole company is “signed up” to the digital journey. Employee training is an important part of the Digital Evangelist role because employees need to cope with many challenges and corporate changes in the process of digital transformation. In all of the cases we found that, although IT is an important part in CDOs roles, is not the primary challenge they face. According to the managing director in Case 4, “Changing a whole organization is the true challenge.”

The Coordinator Role
As well as inspiring all stakeholders, CDOs are responsible for actively stimulating the immense changes that are necessary to successfully execute their companies’ digital transformation strategies. As a consequence, CDOs initiate and design the controlled organizational shift from decoupled silo functions to cross-functional cooperation. The CDOs in the case companies emphasized that digital transformation is not an isolated process, but affects many parts and stakeholders of the company, including IT, product development, HR, marketing and sales. It’s clear that digital transformation requires strong coordination of different functional areas, leaving no space for previous silo approaches and mentalities. However, functional managers, with their focus on their own departments, are often unwilling to pull together. CDOs therefore need to work across organizational silos because digital transformation requires the alignment of executives across functions. The CDO in Case 2 emphasized that “digital transformation cannot take place in a single subsidiary.” CDOs are responsible for interlinking the whole company and acting as coordinators of the digital transformation.

Determinants of the Primary CDO Role
We found that all three CDO roles are important in the work of each CDO in the case companies but that the primary role played by a CDO depends on many factors. (Table 4 lists the primary role played by each of the six CDOs in our study.) These factors include the digital transformation maturity of the company, the digital mindset of the workforce, company size and the reporting relationships of the CDO (and thus the CDO’s influence within the company). The expectations of the CDO role, both from the perspective of the top management team and the CDO, is also an important determinant of the primary role.

In Case 5, for instance, the company does not yet have a digital transformation strategy, and the digital mindset of the top management team is not yet sufficiently developed. Moreover, the CDO has no direct reporting relationship to the CEO. As a consequence, the CDO does not yet have enough influence to implement any profound changes and focuses primarily on the Digital Evangelist role.

The CDO in Case 2 had the very specific assignment to massively grow the company’s online and mobile business. First and foremost, this required her to manage and coordinate all digital activities, which is why she primarily acts as a Coordinator: The CDO in Case 1, however, has a high level of freedom from the top management team to innovate, enhance the customer experience and look out for new business opportunities. As a result, he acts primarily as an Entrepreneur.

Key CDO Skills and Competencies
From our analysis of the CDO roles in the six case companies, we have identified five skills

Table 4: Primary CDO Role Type by Case Company

<table>
<thead>
<tr>
<th>Entrepreneur</th>
<th>Digital Evangelist</th>
<th>Coordinator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1 (Retail)</td>
<td>Case 4 (Market Research)</td>
<td>Case 2 (Tourism)</td>
</tr>
<tr>
<td>Case 3 (Education)</td>
<td>Case 5 (Financial Services)</td>
<td>Case 6 (Publishing)</td>
</tr>
</tbody>
</table>
and competencies companies should look for in a CDO.

**IT Competency**

First and foremost, CDOs need IT competency, as emphasized by the CDO in Case 1: “It is absolutely necessary that the CDO position is filled by someone who completely feels at ease in the digital world.” New digital products and services are based on IT; so CDOs need to have an understanding of IT applications and the underlying infrastructures, as well as knowledge on how they can be upgraded and modified. Moreover, most CDOs collaborate closely with CIOs, who are responsible for the implementation of infrastructures and the evolution of platforms and IT systems. Thus, CDOs need a degree of IT competency in order to formulate IT requirements and iteratively develop new digital products and services in collaboration with CIOs. If CDOs do not have IT expertise, they will not be able to define and communicate the IT requirements for new digital-product and service ideas. As the CDO in Case 3 put it, “If a CDO does not have a basic understanding of IT, then she or he is the wrong person for this job.”

**Change Management Skills**

As well as IT competency, CDOs need business acumen. Profound and specific know-how on strategy, transformation and change management are crucial in this context. While the main focus of CIOs is on IT, CDOs need to understand what new digital technologies mean for their businesses and their customers. Not only do they need to understand the nuts and bolts of the business, such as business models, business processes and customer needs, but also the workings of different business functions, such as finance, marketing, sales, HR and others. Having an understanding of all these different aspects of the business enables CDOs to analyze and understand their companies’ businesses comprehensively. As the CDO in Case 3 put it, “I need to be able to take part in conversations of all kinds and in all areas.” Thus, the CDO’s job is both highly cross-functional and interdisciplinary, and requires highly developed change management skills.

**Inspiration Skills**

The successful execution of a digital transformation requires the ability to inspire others. As the driver of digital transformation, the CDO needs to transmit business-critical information company-wide and across all organizational hierarchy levels. He or she also needs to be able to convince all internal decision makers and employees of the need to digitally transform and to demonstrate the benefits that will come from the transformation. In this context, CDOs need the ability to successfully overcome the resistance and barriers that often stem from traditional corporate cultures. Accordingly, as emphasized by the CDO in Case 6, CDOs need to “have a profound knowledge of the corporate culture and the handling of employees who find themselves in the middle of transformational processes.” CDOs should be able to readily recognize the needs of employees and help them overcome barriers that arise during digital transformation. With the skill to inspire others, CDOs not only act as consultants to the top management team, but also act as effective motivators of the whole workforce and thus enable the digital transformation in the first place.

**Digital Pioneering Skills**

A significant aspect of inspiring and motivating an organization to embark on a digital transformation is that the CDO needs to create a cohesive digital vision for the company. CDOs thus need to act as digital pioneers, which requires them to have a high level of visionary thinking capabilities. Accordingly, CDOs need the ability to look beyond existing strategies and previous procedures and envision the digital future of their companies. Being a successful digital pioneer and conceiving an appropriate digital vision requires CDOs to look at the current and prospective business situations from many different perspectives. As the CDO in Case 4 put it, CDOs need to be “both outward and inward looking.”

**Resilience**

Another key characteristic of a successful CDO is resilience, which will be needed to complete the digital transformation journey. Resilience is even more important in “traditional” companies because digital transformation will require substantial changes. In such companies,
How Chief Digital Officers Promote the Digital Transformation of their Companies

Colleagues of CDOs, both at managerial and at staff levels, won't always embrace the profound changes required for digital transformation.

Case 3 provides a good example of the importance of resilience. This company's transformation was particularly challenging for the CDO, as it moved from a pure print publisher to a modern online education company. The CDO faced internal resistance from many skeptical stakeholders. But, two years after devising a new digital strategy and developing new digital products and services, the development partners (who were also key customers of the company) were highly satisfied with the results. The resilience of the CDO had more than paid off.

The CDO in Case 1 highlighted another essential aspect of resilience: “[CDOs need] to acknowledge failures and to learn from them.” Setbacks are common when companies fundamentally transform their businesses and processes.

CDO Skills and Competencies by Role Type

Although all of the above skills and competencies are needed by any CDO, different CDO role types will need some of them more than others (see Table 5). Based on our analysis of the case studies, Digital Evangelists need particularly well developed inspiration and digital pioneering skills to enable them to effectively advocate the need for digital transformation. Change management skills are valuable for Coordinators, who need to understand all of the many and diverse aspects of a business to effectively coordinate the digital transformation across functions. Finally, the Entrepreneur role is easier to fulfill if CDOs have profound digital pioneering skills that help them explore IT-enabled innovation and create a cohesive digital vision for their companies.

All CDOs require IT competency to accomplish their tasks, and this competency is therefore not specific to any CDO role type. While the importance of resilience depends very much on the mindset of the workforce and willingness to transform, CDOs in any role type can strongly benefit from this characteristic.

When and Why to Establish a CDO Position

Our analysis of the cases shows that companies have established CDO positions to drive their digital transformations in a comprehensive way. We found that CDOs devise and execute digital strategies as Entrepreneurs, serve as catalysts for change by mobilizing the whole company in their roles as Digital Evangelists and coordinate digital transformation efforts as Coordinators. We have also identified the five essential skills and competencies needed by a successful CDO. But does every organization need a CDO to drive its digital transformation?

Across the six case companies, there were two main factors that drove the establishment of CDO positions: (1) there were high levels of external market pressures to digitally transform and (2) there was great internal complexity in the task of coordinating transformation activities across the company. Figure 1 positions the six case companies vis-a-vis these two factors.

The CDO is the only position in a company that is exclusively dedicated to digital transformation. Hence, the higher the pressure for digital transformation is, the greater the benefits, from having a CDO. For instance, the CDO in Case 6 confirmed how important it is in his job to “show and make plausible how fundamental the digital

Table 5: Most Important Skills and Competencies by CDO Role Type

<table>
<thead>
<tr>
<th>Entrepreneur</th>
<th>Digital Evangelist</th>
<th>Coordinator</th>
</tr>
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<tbody>
<tr>
<td>Digital Pioneering Skills</td>
<td>Inspiration Skills</td>
<td>Change Management Skills</td>
</tr>
<tr>
<td></td>
<td>Digital Pioneering Skills</td>
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<tr>
<td>IT Competency</td>
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<tr>
<td>Resilience</td>
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transformation is and how much the company’s current business models are threatened if no actions are taken.” Each of the six case companies faced some level of market pressures to digitally transform. For instance, the CDO in Case 2 told us he had been given “very ambitious goals … to generate a massive growth in the online business, which the company wasn’t able to achieve so far.”

It is no coincidence that the very first CDO was installed in a media group, MTV Networks. The media industry was the first to be disrupted by new digital technologies. For media companies, employing a CDO creates a dedicated position to mobilize the whole company and make clear to everybody what kinds of challenges new digital technologies pose and what opportunities they offer. CDOs can help transform an organization by motivating employees and demonstrating why the status quo cannot continue. As the CDO in Case 4 put it, “I do believe that it makes sense to have this role so that somebody can really push this topic, mobilize everybody and continuously give new impulses.”

A CDO position is also beneficial if there is not an ingrained culture of cross-functional collaboration, which means the company faces an urgent need to better coordinate its digital transformation activities. In the words of the managing director in Case 4, the CDO is “the conductor of the concert” and coordinates the
controlled transformation of the whole company. For instance, the CDO in Case 1 told us: “I believe that due to the high velocity in which these changes take place, a CDO is needed: someone who has horizontal responsibility, who coordinates and drives these changes. Otherwise, many parts of the company might drop the changes again.” The CDO in Case 2 confirmed this view by suggesting that “a digital transformation does not take place in a single department.” In her company, “many silos need to be removed” and “a dedicated position was necessary to serve as a driving force and bundle all digital activities.” Thus, in the words of the CDO in Case 3, a CDO should be able “to rethink the whole company in all areas” and “join in any kinds of conversions in each single department.”

In particular, we recommend that a business in which the coordination of digital transformation activities across the organization is very complex should create a CDO position. Coordination complexity will be greater in larger companies and in companies with a decentralized structure or a large amount of organizational dependencies between products, processes and IT systems.

**Lessons Learned**

We have derived four key lessons from the analysis of the six cases. The first lesson addresses and informs organizations, the second is relevant to CDOs, the third applies to CIOs, and the fourth relates to whether CIO positions are a temporary phenomenon.

1. **Top Management Should Ensure CDOs Have Sufficient Authority**

   Our analysis shows that CDOs assume cross-company authority for digital initiatives to overcome the slow pace of digital transformation in organizations. For far too long, inertia has held back digital transformation initiatives in many industries and companies. These industries and companies now need to adjust rapidly to modified market conditions and customer demands. Organizational dependencies may also have delayed a timely adjustment. Five of the six CDOs in our study have successfully conceived digital transformation strategies and implemented the associated digital initiatives in a timely manner. The striking exception is the CDO in Case 5, who was the only one not reporting directly to the CEO and who did not have a seat at the top management team meetings. This CDO is positioned at business unit level (as part of the communication department) and seems to lack the authority needed to effectively pursue company-wide digital initiatives. This situation results primarily from insufficient top management commitment to digital transformation, which, however, seems to be a critical success factor for the business.

2. **CDOs Should Hone the Skills Required for their Primary CDO Role(s) and Address the Challenges Caused by Internal Resistance**

   While all the skills and competencies we identified are highly beneficial for any CDO, CDOs should specifically hone the skills most required by their current primary role type (see Table 5). While any CDO role type needs IT competency, *Digital Evangelists* benefit particularly from highly developed inspiration and digital pioneering skills. Change management skills are especially valuable for *Coordinators*, while *Entrepreneurs* benefit most from well-developed digital pioneering skills. Awareness of the relationships between roles types and skills will enable CDOs to hone and employ the skills they require.

   Regardless of how skillfully CDOs perform their primary role type during digital transformation, they will inevitably face internal resistance to the transformation process. CDOs therefore also need high levels of resilience and perseverance. They must be aware of potential resistance from colleagues and the organization as a whole and must not shy away from the associated challenges that lie ahead in the digital transformation journey.

3. **Appointment of a CDO Offers Opportunities for the CIO**

   Some CIOs may fear that they might be replaced by a newly appointed CDO or relegated to a secondary position in the digital transformation journey. At first glance, this fear might be justified, but we believe the contrary is true. CDOs not only act as *Digital Evangelists* for the digital transformation of their companies, but also as advocates for the IT function itself. Many CIOs still struggle to get a seat at the top management table, but there is evidence that appointing a CDO strengthens the authority and
reputation of the CIO. In each of the cases where the CDO reported directly to the CEO, the CIO was also a direct report of the CEO. While we do not know if there is a causal link behind this observation, we can certainly say that the CIOs in these cases had a high reputation and that their CEOs and top management teams regarded them as valuable for the digital transformation. CIOs should therefore embrace the opportunities that the appointment of a CDO offers them and make the most of the visibility they can gain through collaborating extensively with CDOs.

4. CDO Positions May Be a Temporary Phenomenon

Many commentators and researchers on IT management practices regard the CDO position as a temporary phenomenon. Indeed, many of our interviewees held this view. As the CDO in Case 4 put it, "At the end of the day, this is a position that will disappear as soon as the company has become digital." Others, however, propose that CDOs might become the next CEOs. We cannot, as yet, take a final position on this issue because CDOs are still a fairly recent phenomenon. It will be interesting to monitor the future development of the CDO position.

Concluding Comments

To help managers understand why CDO positions have been established and how CDOs can be successfully installed to guide organizations through their digital transformation journeys, this article has presented six case studies of CDOs and described how they fulfill their positions. Based on these cases, we have identified two main factors that drive the creation of CDO positions: high market pressures to digitally transform, and the complexity of coordinating digital transformation activities across a company. We have also identified three role types that CDOs can play (the Entrepreneur, the Digital Evangelist and the Coordinator) and five types of skills and competencies CDOs should have. While each CDO should possess IT competency and resilience, the significance of change management skills, inspiration skills and digital pioneering skills depends on each CDO’s primary role type. From our analysis of the case companies, we have derived four key lessons that will ensure businesses equip their CDOs with the skills to successfully navigate them through their digital transformation journeys.

Appendix: Research Methodology

To explore the CDO role in detail, we investigated six companies and conducted at least one interview in each organization. In total, we conducted 10 interviews. These interviews were semi-structured and comprised open-ended questions on topics such as the companies’ motivations to install a CDO, the CDOs’ tasks and the challenges CDOs face. If necessary, we further probed the interviewees via e-mail to seek clarification. All interviews were audio taped and subsequently transcribed. When analyzing the interviews, we carefully scanned for similarities and differences in the companies’ digital transformations and the CDOs’ tasks. To verify the statements from the interviews, we used secondary data sources (e.g., company presentations, internal documents and publicly available press).

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