The chief digital officer (CDO) role has emerged in recent years and is attracting a great deal of attention. Digital innovation impacts every industry, and as a response, many organizations have introduced this new C-suite leadership role—the chief digital officer (CDO). Based on interviews with 35 CDOs from various sectors, we have identified the domains where successful CDOs build digital capabilities (digital innovation, data analytics and customer engagement) and three types of CDOs—digital accelerators, digital marketers and digital harmonizers. Each type focuses specifically on one of the digital capabilities. The article concludes by considering the relationship between CDOs and CIOs.

Three Types of Chief Digital Officers and the Reasons Organizations Adopt the Role

Digital innovation impacts every industry, and in response, many organizations have introduced a new C-suite leadership role—the chief digital officer (CDO). Based on interviews with 35 CDOs from various sectors, we have identified the domains where successful CDOs build digital capabilities (digital innovation, data analytics and customer engagement) and three types of CDOs—digital accelerators, digital marketers and digital harmonizers. Each type focuses specifically on one of the digital capabilities. The article concludes by considering the relationship between CDOs and CIOs.

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The Rise of the Chief Digital Officer

The chief digital officer (CDO) role has emerged in recent years and is attracting a great deal of attention. Digital innovation impacts every industry, and as a response, many organizations have introduced this new leadership role in their C-suites. However, since the CDO role is still in its nascent stages and not well defined, the role means different things to different organizations.

For example, some organizations leverage the role of the CDO to emphasize digital capabilities at a strategic level. CDOs are often key evangelists in organizations for a general entrepreneurial mindset and facilitators of enterprise-wide change associated with digital transformation. In some organizations, CDO responsibilities are more tactical and involve...

1 Jeanne Ross is the accepting senior editor for this article.
2 The authors gratefully acknowledge the support and time of all the CDOs who participated in the study, as well as the editorial and review team for detailed and insightful feedback. This research was funded by the Research Fund of the University of Liechtenstein (Forschungsförderungsfonds der Universität Liechtenstein) in frames of the project wi-1-14 “Institutional Logics of Digital Innovation.”
leading a variety of specific initiatives and projects that digitally enable units across the organization and its customers. In other organizations, CDOs are charged with leading product and service innovation. Here, CDOs are often thought to exist at the intersection of different functions—most commonly IT and marketing, but also product development, technology strategy, communications, operations and others. Still other organizations address digital innovation through existing executive roles, such as CIOs.

Overall, there is little guidance on whether an organization should adopt a CDO role. To decide, organizations need answers to two particular questions: What, specifically, do CDOs do? Why do different organizations establish the CDO role? This article sets out to provide answers to these questions. We interviewed 35 CDOs across a wide variety of industry sectors to get insight into when adopting the CDO role makes sense (see Table 1 on next page).

Our research shows that the core reason organizations appoint a CDO is to drive business value from digital technologies. From our interviews (further information about the research methodology is in the Appendix), we identified three focal domains where CDOs build digital capabilities to drive business value: digital innovation, data analytics and customer engagement. Furthermore, we suggest there is a distinct type of CDO associated with each of these digital capabilities—digital accelerator, digital marketer and digital harmonizer.

Based on these insights, we discuss the relationship between organizations' traditional IT functions and their emerging digital requirements, and describe how CDOs and CIOs can complement each other. We reflect on the role of the CDO in relation to the established role of the CIO—the executive most commonly charged with innovation with digital technologies. Many CIOs are actively embracing new opportunities in digital innovation, so the relationship between the CDO and CIO is an important one.

### Characteristics of a Successful CDO

In our interviews with CDOs, we explored their roles by asking opened questions, including: Why did the organization create the CDO role? What are the tasks and responsibilities of the CDO? What kind of outcomes do CDOs drive?

In general, CDOs help their organizations to use digital technologies to create business value. They are engaged with developing digital capabilities in relevant domains and successfully using various classes of digital technologies to generate value. They need to continually focus on seizing new opportunities. An organization's CDO is responsible for questioning the existing business model and evaluating customer-centeredness, using a variety of data to gain insights. To cope with these business imperatives, the CDO must be well-versed in experimenting with and applying a variety of digital technologies.

Successful CDOs need to actively sense the environment for emerging digital technologies and then work to build digital capabilities in their organizations. To attain goals associated with any digital capability, organizations must leverage various technologies, such as mobile apps, social media, the Internet of Things or other emerging domains. However, these emerging domains are ever-expanding. In our interviews, different CDOs emphasized distinct areas. For example, some emphasized mobility and the importance of mobile applications able to extend the digital experience to everyday interaction with mobile devices. The CDO of a museum explained how mobile apps extend the museum experience:

> “That [mobile apps] was probably the most fundamental way that we changed the organization ... digital is really integrated into the experience while you're in the institution, as well as [allowing you to experience it offline if you can’t come to the institution or [allowing you to] ... have more experiences [when you get home]. ... The apps ... we built [got] the museum outside the walls with the use of digital.”

CDO, CultureHouse 1

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In addition to mobility, many CDOs emphasized the role of social media. Intense interaction with social media helps organizations to create a more precise profile of their customers and to engage with them through various channels. For example, the CDO of a manufacturing and retail organization described how his company had built capabilities around

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Table 1: Overview of Respondents

<table>
<thead>
<tr>
<th>Company</th>
<th>Industry Sector</th>
<th>Time in Position (years)</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>FinancialServ 1</td>
<td>Banking and finance</td>
<td>0.25</td>
<td>U.S.</td>
</tr>
<tr>
<td>FinancialServ 2</td>
<td>Banking and finance</td>
<td>0.85</td>
<td>U.K.</td>
</tr>
<tr>
<td>InsuranceFirm</td>
<td>Insurance</td>
<td>0.85</td>
<td>U.S.</td>
</tr>
<tr>
<td>HealthRelated</td>
<td>Healthcare</td>
<td>1</td>
<td>Europe</td>
</tr>
<tr>
<td>RetailOrg</td>
<td>Retail</td>
<td>1.25</td>
<td>Australia</td>
</tr>
<tr>
<td>Manu&amp;Retail</td>
<td>Retail and manufacturing</td>
<td>1</td>
<td>U.S.</td>
</tr>
<tr>
<td>RetailCommunication</td>
<td>Retail</td>
<td>3</td>
<td>Europe</td>
</tr>
<tr>
<td>Manufacturing 1</td>
<td>Custom part manufacturing</td>
<td>2</td>
<td>Europe</td>
</tr>
<tr>
<td>Manufacturing 2</td>
<td>Hard manufacturing</td>
<td>5.5</td>
<td>Canada</td>
</tr>
<tr>
<td>Manufacturing 3</td>
<td>Transportation vehicle</td>
<td>1.5</td>
<td>Europe</td>
</tr>
<tr>
<td>ArchitectureDesign</td>
<td>Architecture, engineering</td>
<td>4</td>
<td>U.S.</td>
</tr>
<tr>
<td>SoftwareCom 1</td>
<td>Software</td>
<td>0.85</td>
<td>Europe</td>
</tr>
<tr>
<td>SoftwareCom 2</td>
<td>Software</td>
<td>1</td>
<td>U.S.</td>
</tr>
<tr>
<td>FinancialServ 3</td>
<td>Banking and finance</td>
<td>0.5</td>
<td>Europe</td>
</tr>
<tr>
<td>Media Publisher 1</td>
<td>News publishing</td>
<td>1.25</td>
<td>Europe</td>
</tr>
<tr>
<td>Media Publisher 2</td>
<td>News publishing</td>
<td>1.85</td>
<td>Europe</td>
</tr>
<tr>
<td>Media Publisher 3</td>
<td>Specialized publisher</td>
<td>2</td>
<td>Europe</td>
</tr>
<tr>
<td>Media Publisher 4</td>
<td>Specialized publisher</td>
<td>5.5</td>
<td>Europe</td>
</tr>
<tr>
<td>Media Publisher&amp;TV 5</td>
<td>News publishing and broadcasting</td>
<td>0.5</td>
<td>Europe</td>
</tr>
<tr>
<td>Media Film 6</td>
<td>Film producer education/non-profit</td>
<td>4</td>
<td>Canada</td>
</tr>
<tr>
<td>Media TV 7</td>
<td>TV broadcasting</td>
<td>3.5</td>
<td>U.S.</td>
</tr>
<tr>
<td>Media Advertising 8</td>
<td>Advertising</td>
<td>1</td>
<td>Europe</td>
</tr>
<tr>
<td>Media Advertising 9</td>
<td>Advertising</td>
<td>2</td>
<td>U.S.</td>
</tr>
<tr>
<td>Media Advertising 10</td>
<td>Advertising</td>
<td>1</td>
<td>South America</td>
</tr>
<tr>
<td>Media Advertising 11</td>
<td>Advertising</td>
<td>1</td>
<td>U.S.</td>
</tr>
<tr>
<td>GovInstitution</td>
<td>Governmental/non-profit</td>
<td>0.5</td>
<td>Europe</td>
</tr>
<tr>
<td>Labor Union</td>
<td>Association/non-profit</td>
<td>0.25</td>
<td>U.S.</td>
</tr>
<tr>
<td>EducationOrg 1</td>
<td>Education/non-profit</td>
<td>4</td>
<td>U.S.</td>
</tr>
<tr>
<td>CultureHouse 1</td>
<td>Culture/non-profit</td>
<td>1.5</td>
<td>U.S.</td>
</tr>
<tr>
<td>CultureHouse 2</td>
<td>Culture/non-profit</td>
<td>4</td>
<td>U.S.</td>
</tr>
<tr>
<td>DevelopSkill</td>
<td>Leadership education/non-profit</td>
<td>1</td>
<td>Europe</td>
</tr>
<tr>
<td>EducationOrg 2</td>
<td>Education</td>
<td>2</td>
<td>U.S.</td>
</tr>
<tr>
<td>ConsumerGood 1</td>
<td>Consumer goods</td>
<td>1.5</td>
<td>U.S.</td>
</tr>
<tr>
<td>ConsumerGood 2</td>
<td>Consumer goods</td>
<td>1</td>
<td>U.S.</td>
</tr>
<tr>
<td>FinancialServ 4</td>
<td>Banking and finance</td>
<td>1</td>
<td>Europe</td>
</tr>
</tbody>
</table>

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8 Pseudonyms have been used for each of the companies.
social media by emphasizing the value of “non-paid” customer acquisition:

“There is paid acquisition and non-paid. ... Paid ... includes channels such as Google AdWords, display affiliates, ... paid social media, organic search and [so on]. ... Then you’d have your unpaid channels within the acquisition bucket, ultimately driving traffic to your websites and mobile products.” CDO, Manu&Retail

Overall, we found that all CDOs were very focused on building capabilities with a variety of digital technologies. There were, however, three specific domains on which different CDOs focused: digital innovation, data analytics and customer engagement. The relevant capabilities for each domain are summarized in Table 2, and we describe each domain below.

### Table 2: Digital Capabilities of CDOs

<table>
<thead>
<tr>
<th>CDO’s Domain</th>
<th>Relevant Capability</th>
<th>Example Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Digital Innovation</strong></td>
<td>Building digital capabilities for intense experimentation; pursuing strategic changes to organizational processes, products, services and business models.</td>
<td>“I think my largest problem is ... how can you transform a business model from the print age. ... I think this is the hardest challenge: how do you do that step-wise in a certain amount of years [while] protecting the business you already have but also building a new model.” CDO, Media Publisher 1</td>
</tr>
<tr>
<td><strong>Data Analytics</strong></td>
<td>Building capabilities for data analysis to gain insights into both internal and external data sources.</td>
<td>“With one of our design businesses—designing hotels, resorts and such—we were able to look at ... TripAdvisor for ... reviews of the facilities that we designed. ... We’re also looking at ways [of using] something from TripAdvisor. What is public data, what can we use from that and how do we do it? Likewise with design forums or discussion groups and [so on]. Those are the ... non-structured data sets that we’re interested in understanding: what’s the general conversation, what’s the general pulse?” CDO, ArchitectureDesign</td>
</tr>
<tr>
<td><strong>Customer Engagement</strong></td>
<td>Establishing capabilities for providing intense focus on relationships with the organization’s customers; delivering outstanding customer experience by also streamlining internal processes.</td>
<td>“In healthcare, our customers [are] pharmaceutical companies, doctors and patients. Their expectations are changing from analog services to digital services. As a result, one of the things that I do is study my customers’ customers’ needs so that I can anticipate as a vendor what I should be supplying them with. In many ways, I’m studying patient needs and ... doctor needs to figure out what pharmaceutical companies are going to need so that we become the ... next generation supplier.” CDO, SoftwareCom 2</td>
</tr>
</tbody>
</table>
Three Types of Chief Digital Officers and the Reasons Organizations Adopt the Role

with continually experimenting. According to our interviewees, strong CDOs take an agile approach to innovation and continually drive experimentation and iteration. The experimentation approach involves creating a minimal viable digital product and developing it further based on a pilot implementation and feedback. The CDO from a media company described this way of working:

“[W]e are able to set up small meetings where we can test our minimal viable products... just looking at the opportunities that digital brings to reach people in your target audience more times in the day, as well as to offer products to more people via other platforms. ... You build things very lightly, very agilely and very much focused on speed and getting something out into the market and into the hands of consumers as early as possible, and then start learning together with the consumer because of how they interact with your product. [You] ... look at that and then try and build ... capabilities from there.” CDO, Media Publisher 2

In all the interviews, a common theme for the foundation of a successful CDO was being comfortable with indeterminacy, experimentation, learning and adaptation.

The Data Analytics CDO Domain

In the age of “big data,” our interviewees pointed out that strong CDOs develop or acquire capabilities for data analysis so they can gain insights from both internal and external data sources. Some CDOs explained how they had built up data analytics portfolios, which involved them using both openly available data from forums or similar websites (see Table 2), and also internal data, to improve performance:

“Those are the more ... non-structured data sets that we’re interested in understanding: what’s the general conversation, what’s the general pulse?... [for example] in the hospitality world, our hotel and resort client is the operator [of flagship chains]—Hilton, Regent, etc. But to suddenly get feedback from the end user, the person or traveler checking into [the hotel or resort] ... gives us so much more information.” CDO, ArchitectureDesign

Not all CDOs need to be technical experts—they do not need to be able to analyze data directly—but they do need to understand what data can do for their organizations and lead the efforts to analyze data for new insights. It is important to note that it is not necessary for CDOs to fully understand data analytics. Again, though, they should take an experimentation-oriented approach to building analytics capabilities. Successful CDOs are comfortable with learning as they go—as the ArchitectureDesign CDO indicated: “In data analytics, we’re still trying to figure out what we need to do.” This was the case for virtually all the CDOs we interviewed.

The Customer Engagement CDO Domain

CDOs also focus intensely on relationships with their organizations’ customers—understanding the customer experience and the role of digital technologies in this experience. The end customer was the center of attention across our sample of CDOs. For example, the CDO of a healthcare software vendor whose clients are pharmaceutical companies described how he studies the needs of patients and doctors (the pharmaceutical companies’ customers). The insights he gains from studying patients and doctors enables him to learn what health-related companies will need in the future (see example in Table 2). Another organization, a training service provider, allows customers to access most of its offers before they subscribe to its service:

“As a university student or a company, you [used to] have to sign up on our website and pay before you saw any types of opportunities or talent. The difference [and the value] now is [you see all this right away]. ... It is very much like a social network.” CDO, DevelopSkill

To be successful, it is becoming critical for CDOs to focus on their organizations’ end customers:
“[We are] looking at what type of content people are responding to really well. Where is there room for opportunity? What posts are not working so well? ... Social media is becoming more important because a lot of our partners come to us for social media activation and campaigns.” CDO, DevelopSkill

According to the CDOs we spoke with, focusing on end customers is not always the key priority for many functional units in an organization—particularly those units that service other areas of the organization. Without exception, the CDOs we spoke to have a laser-like focus on the end customer.

All three domains were relevant for all the CDOs we interviewed to a lesser or greater extent. CDOs are responsible for questioning existing business models, evaluating customer-centeredness and using a variety of data for gaining insights. To deal with these business imperatives, CDOs must be well versed in experimenting with, and applying, a variety of digital technologies. However, each of the CDOs we interviewed told us that one of the domains was their primary focus in their explanations of their work. Next, we present the three CDO types we identified and illustrate how the different types emphasized diverse domains during the interviews.

### Three Types of CDOs

The three types of CDO we identified are digital accelerators, digital marketers and digital harmonizers.

#### Digital Accelerator CDOs

We classified 13 of the CDOs in our sample as digital accelerators. This type of CDO spanned various industries, including financial services, manufacturing and retail. As shown in Table 3, the common characteristic of digital accelerator CDOs is that they drive digital innovation—typically complementing existing IT leaders who are predominantly involved with supporting operational and mission-critical activities. The existing IT leadership in these organizations focused on maintaining and advancing the current IT infrastructure and architecture, with a strong emphasis on reliability, performance and security.

The 13 digital accelerator CDOs pointed out that their organizations needed a secondary IT-related function freed from responsibilities

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Characteristics</th>
<th>Illustrative Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Capability</td>
<td>Digital innovation</td>
<td>“My primary KPI [key performance indicator] that I set for myself is to create a digital experience that includes other things as well. [We are] a mobile bank, we provision and sign up bank accounts, savings, lines of credit only via the mobile phone. We have a website as well, but there are no branches.” CDO, FinancialServ 1</td>
</tr>
<tr>
<td>Primary Objective</td>
<td>Experimentation and implementation</td>
<td>“[The IT department] had a very traditional approach, wanting to buy very expensive analytics packages ... have a two-year roll-out. I was not willing to take that time. ... I’m very careful to say we don’t do education or training ... we are not in the business of training people in Google analytics or training people very hands on.” CDO, EducationOrg 1</td>
</tr>
<tr>
<td>Reason for Establishing the Role</td>
<td>To adopt bimodal IT, allowing the IT function to focus on the underlying infrastructure</td>
<td>“In the old-fashioned way, [the IT function] worked very [well]. I don’t know how much you are familiar with this bimodal way of working [described by] Gartner ... I think we are very good in this mode, mode one I think is the lower one ... the [old IT] processes in this company are not made for fast failure and [trial] and error.” CDO, FinancialServ 3</td>
</tr>
</tbody>
</table>
of maintaining the existing IT infrastructure. These CDOs have the freedom and flexibility to experiment intensely with a variety of digital technologies. According to many interviewees, the scope of the CDO is different from that of IT executives in their organizations—less focused on operational reliability and more focused on experimenting with new capabilities in novel areas:

“You simply build something separate anew as if you were a start-up—[you] just build a completely parallel, new infrastructure. By doing that, you remove a lot of the tension between digital and IT and the need to transform the technology and the ways of working that exist in IT.” CDO, FinancialServ 2

The CDO of a financial service organization explained that her role is needed to focus on different forms of innovation because the CIO is taking care of the operations and maintenance of existing IT activities. The CDO of an insurance company shared similar thinking. He explained that “digital” cannot become the top priority of the traditional IT executive’s agenda in every organization because there are so many other tasks involved in maintaining existing systems:

“Traditional IT leaders … [face] tremendous pressures to deliver and execute and support the operational systems … Digital was always … going to be deprioritized because of those pressures to deliver and execute the operational system.” CDO, InsuranceFirm

Digital accelerator CDOs therefore complement more conservative IT organizations by focusing on rapid development and evaluation of digital technologies. This type of CDO is found in organizations with well-established structures where the IT functions operate according to principles that require long planning cycles and slower execution. The role of digital accelerator CDOs is to achieve fast results by facilitating continual experimentation with minimal viable products of digital innovations.

The focus on experimentation allows for more flexibility without needing to align with other ongoing IT-related activities. Continuous experimentation was a common characteristic of the digital innovation approach followed by digital accelerator CDOs. Although other types of CDOs also used experimental processes, experimentation was the defining characteristic of digital accelerator CDOs. In many ways, what they described was more like a “skunk works” rather than the cross-organizational scope of other types of CDOs. Digital accelerator CDOs reported being insulated from the demands of ongoing operations, which allowed them to freely evaluate, test and learn about different digital innovations.

A key principle for digital accelerator CDOs is that they reduce the cycle time required for different areas to consider and incorporate digital innovations (see Table 3). According to the CDO in a media organization, this requires a “we don’t need to build and create everything” mindset and seeking out available options, including social media, crowd sourcing and other platforms.

Even though a digital accelerator CDO “owns” new digital innovation projects, it is still necessary to align with existing IT initiatives. As the CDO of a manufacturing company explained, it is important to learn to respect the existing IT landscape:

“We need to be sure that the ‘second speed’ IT respects the major infrastructure. … We don’t want to be cowboys … not respecting what we [already] have security-wise, technology-wise and stuff like that. It’s the right balance that we need to find. It wasn’t evident [in] the last couple of years, but we’re almost there now.” CDO, Manufacturing 2

Digital accelerator CDOs are generalists—focusing on a variety of digital opportunities. Note, however, that not all CDOs complement the IT function; some complement different units such as marketing, as described below.

**Digital Marketer CDOs**

This type of CDO guides the organization’s digital marketing efforts with an emphasis on customer intimacy through technologies like social media and mobile computing, as well as intensive analysis of customer data. We classified eight of our interviewees as digital marketer CDOs whose roles had been established to streamline online and offline marketing channels.
for engaging with the customers. These CDOs complement marketing efforts by deploying
digital technologies that can enhance products, customer relationships and competitive position. Table 4 summarizes the digital marketer CDO approach.

The CDO in a publishing organization described how IT people were moved out of the IT function to assist the marketing department and how this eventually evolved into the CDO role:

“I had to hire people [who] had to think about products. We had to create a support team ... and gradually my role evolved from being the old-school IT manager to somebody [who] was thinking along with the business. ... [I] was appointed to a role [where I was] responsible for product development.... The people in my department were more technical, of course. In the last couple of years, the marketing [department] was more into doing digital developments. [This] is what we call e-marketing in terms of making sure that we have the correct profile of our customers ... so we also had to think how digital marketing could be implemented.” CDO, Media Publisher 4

The CDO of a manufacturing company tasked with digitizing the customer-facing part of the organization told us that it may be better for traditional marketing to report to the CDO:

“My role is actually ... unique in ... that I manage the brand as well. We’ve just [moved] to a completely new re-branding process ... If I was ever to leave the company and move to a new CDO role, I would like those responsibilities as well, because I think ... the CMO, or senior marketing person, has to report into a CDO ... I mean marketing itself; I don’t think marketers have kept up with digital technology.” CDO, Manufacturing 1

Although this CDO’s view is not necessarily held by all CDOs, it does highlight the importance of digital innovation to current-practice marketing efforts. The digital marketer CDO role is integral to the role of customer-facing units and is thus concerned with establishing digital channels to the customer and mobile solutions, and with understanding user experiences in leveraging digital capabilities. As one CDO indicated, she was hired to bring digital competencies to her organization’s marketing practices:

Table 4: The Digital Marketer CDO Approach

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Characteristics</th>
<th>Illustrative Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Capability</td>
<td>Data analytics</td>
<td>“Our clients are hotel chains like Hilton, the Regent, ... but [hotel users now participate in] online communities about design, about the spaces that are being built, etc. ... We track these ... sites looking for [information]. We also look at ... how [we can learn from] [things] like Trip Advisor, ... design forums or discussion groups and [so on].” CDO, ArchitectureDesign</td>
</tr>
<tr>
<td>Primary Objective</td>
<td>Customer intimacy</td>
<td>“He [the CMO] asked for some advice from someone like me to ... show him what was possible on a digital front. I gave him some comparables of companies who, in the consumer goods space, could demonstrate real power of the brand, real strategic advantages [from] ... digital ... and presented a new customer face that was more in keeping with the millennial market and the younger markets, which he wanted to attract.” CDO, ConsumerGood 1</td>
</tr>
<tr>
<td>Reason for Establishing the Role</td>
<td>To create a consistent customer experience across digital and non-digital channels</td>
<td>“Marketing falls within my responsibility but also internal marketing, external communications and so on. Effectively, our customers or potential customers have multiple different touchpoints [from which] they can reach out to us. Effectively, I have to manage all of those.” CDO Manufacturing 1</td>
</tr>
</tbody>
</table>
“Digital is very much about delivering, or having a direct-direct relationship with the end customer. I was hired ... to bring that skill level or experience to the company, where previously they were dealing with a business-to-business relationship. ... Yes, marketing falls within my responsibility, but also internal marketing, external communication and so on.” CDO, Manufacturing 1

Some of the digital marketer CDOs in our study run the digital side of marketing quite independently and almost as a standalone unit. For example, the CDO of a consumer goods company described her unit as a standalone start-up with very specific goals that involved a major project:

“There’s a very clear goal to try and bring it all together. We started off in a very separate fashion with the digital store (like an Apple app store), where you could buy content, and an e-commerce store where you could buy the hard goods. Finally, last year, we managed to bring it together [in] one store so that customers could have one [purchasing] experience.” CDO, ConsumerGood 2

In this company, the CDO’s unit will likely persist in its current standalone mode for a limited period of time. At some point, the major project may well be subsumed by pre-existing functions, such as marketing and sales.

However, some digital marketer CDOs may take on responsibility for the marketing function (see CDO of Manufacturing 1 in Table 4). The digital marketer role is therefore often either temporary until the organization gets up to speed, when the role is subsumed by the broader marketing organization—or the CDO becomes responsible for all marketing activities.

**Digital Harmonizer CDOs**

In addition to complementing the IT or the marketing functions, some CDOs are brought in to take an aggregate view of all ongoing digital initiatives. These are what we term digital harmonizer CDOs. The 14 CDOs we classified as digital harmonizers were charged with linking together a wide variety of digital initiatives in many different areas of their organizations, a situation that was prevalent among media firms in our sample. The digital harmonizer role is a way of bringing these initiatives under a single, typically more strategic, umbrella. Digital harmonizers aggregate the disparate digital efforts distributed across the organization into a single unit and coordinate them. They emphasize governance and the need for transparency in digital projects. Table 5 summarizes the digital harmonizer CDO approach.

The CDO of a pharmaceutical company vividly illustrated the digital harmonizer CDO role:

“The first thing I did was to establish a digital council, [which includes] our CIOs, [our] CMOs, our top leadership of the organization.... As digital evolves in a company, you see a lot of things pop up in many places, but they [aren’t aware of] each other. ... A lot of digital activity started before I was here. ... There was so much ... going on across divisions, and teams and countries, that it really came bottom-up, and the top management said, ‘Okay, we probably need to take all of this activity and put it into a strategic approach.’” CDO, HealthRelated

In her effort to elevate digital innovation activities to a more strategic level, the CDO of a museum explained how a lot of digital work had already been done in the organization, but it still needed direction, which she aimed to provide:

“It was really more about changing the culture and the approach, the strategic approach, to doing the work they were already doing, but doing it in a much more thoughtful way [so] that the whole institution was working in the same direction, as opposed to children in parallel play doing their own thing, which was how it was before.” CDO, CultureHouse 2

This CDO also often emphasized the need to catch up with digital trends at a strategic level, or to lead organization-wide digital transformation.

Digital harmonizer CDOs both manage digital initiatives across the organization and elevate

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attention to these initiatives to a strategic level. Their organizations already have some level of digital capabilities, and one mechanism for raising attention to digital innovation to a strategic level is to add the CDO role to the C-suite. Digital harmonizers often described how they need to create connections between existing and new digital capabilities. The basic idea is to move digital innovation projects back to other functional groups after they have been implemented:

“Before having a digital [department], some organizations that were really innovation orientated had somebody in charge of R&D innovation. Marketing, [HR, finance, etc.] had their responsibilities, [but] digital changes [everything] because [its] scope ... is so vast, and it’s so transversal. ... At [some] point, it’s [maybe] important to have somebody covering all [the digital initiatives] and making the connections between everybody. ... But then every specialist has to take the responsibility for his or her own field, because at the end of the day, it’s going to be innovation in marketing, or innovation in finance, etc.”

CDO, RetailCommunication

The role of the digital harmonizer CDO is to constantly act as an intermediary and, by doing so, achieve strategic visibility. However, this is not a pure top-down strategic role because the CDO needs to consider existing capabilities. The digital harmonizer creates links to the existing organization through a continuous flow of new ideas. Organizations with digital harmonizer CDOs emphasize visibility, prioritization and coordination of digital efforts (see Table 5).

In addition to their long-term and strategic focus, digital harmonizer CDOs indicated a concern for reconciling existing organizational values with digital innovations. Transitioning gradually toward a more digital organization is a long-term effort and can result in fundamental transformation.

Table 5: The Digital Harmonizer CDO Approach

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Characteristics</th>
<th>Illustrative Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Capability</td>
<td>Customer engagement</td>
<td>“It’s a complete shift in the way we deliver customer value because we understood that ... other organizations like LinkedIn and other job postings [were] opening up their doors for anyone to look and see without having a payroll. We [asked ourselves] ‘How do we make our organization more accessible to anyone?’” CDO, DevelopSkill</td>
</tr>
<tr>
<td>Primary Objective</td>
<td>Enterprise integration</td>
<td>“One of the things that I did was [to] build a digital strategy and a strategic plan for the next 10 years and ... a road map. ... [I] then worked with government, so that instead of everyone doing their own individual digital projects ... there was a process in place where a group of people ... at the working level [would] look at [digital ideas] and then ... very senior [managers would] look at [the ideas] and set priorities and continue to evolve those priorities.” CDO, Culture House 2</td>
</tr>
<tr>
<td>Reason for Establishing the Role</td>
<td>When business silos are limiting the impact of digital innovation</td>
<td>“When we set up new programs or projects, we create a team to work on [them]. ... We call [these teams] “squads” in the same way that Spotify uses that term. [Thus] we create [a] central team of skills from [within] the organization. [For] example, ... we put a couple of developers, a solution architect, a user researcher [together with] a data scientist and a designer [into a squad] ... so [we] have the data side very much represented within the digital side as well. We make sure that we cover all relevant areas. These cross-functional teams [are] created from across ... the different divisions, including digital, data and technology.” CDO, GovInstitution</td>
</tr>
</tbody>
</table>
Comparison of Three CDO Types

From our interviews, we saw that each CDO type focused mainly on one of the domains. As shown in Table 6, each of the three CDO types focuses on building a distinct digital capability: the digital accelerator emphasizes shortening innovation cycles and experimentation; the digital marketer is highly focused on the data analytics domain; and the digital harmonizer aggregates existing digital initiatives to strategically engage with the customer and streamline existing and new digital initiatives.

Bridging Traditional IT (CIO’s Domain) and Digital Innovation (CDO’s Domain)

Having looked at the three types of CDOs and their key capabilities, we now turn to the relationship between the CDO’s and CIO’s organizations. Over the years, the IT function in many organizations has evolved from being a supporting unit to become a critical strategic partner of other business units. This strategic focus was often accompanied by greater attention to enterprise information systems (such as ERP and CRM) as critical enablers of business operations.

However, the evolution has pigeon-holed some CIOs, in terms both of the opinions of other business units and of the mindsets of CIOs themselves. Business units perceive CIOs as technical specialists who focus on enterprise systems and infrastructural investments, and are forced to conduct their processes through a standardized, centrally mandated architecture. Similarly, CIOs themselves often perceive their role as associated with enterprise systems and the IT infrastructure. As a consequence, experiments with digital innovations may not be high on a CIO’s agenda because he or she is focused on maintaining large-scale mission-critical systems performance in a reliable and secure manner. Often, the CIO simply cannot add more responsibilities to her agenda, as illustrated by one of the CDOs we interviewed:

“The poor CIO is always worried about legacy systems, maintaining all of the right stuff for legal matters, compliance, regulation and so forth. [Given] that, ... how can we [the organization] innovate [with IT]? Who [is thinking about]... what would we be doing [if we didn’t have the boring email we’ve been using for 10 years]. How would we be tracking conversations? You ... need two positions. ... You have [huge] amounts of information that you need to maintain, and, suddenly, [the] person who’s responsible for that ... no longer [has] any more time in their schedule. They [CDOs] are not constrained by worrying about existing hardware, and [it’s not their responsibility] if there’s an emergency ... or the power goes off or [a] cable is cut. They just keep focused on innovating.” CDO, ArchitectureDesign

Table 6: Overview of the Three Types of CDOs and Their Key Characteristics

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Digital Accelerator</th>
<th>Digital Marketer</th>
<th>Digital Harmonizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Capability</td>
<td>Digital innovation</td>
<td>Data analytics</td>
<td>Customer engagement</td>
</tr>
<tr>
<td>Primary Objective</td>
<td>Experimentation and implementation</td>
<td>Customer intimacy</td>
<td>Enterprise integration</td>
</tr>
<tr>
<td>Reason for Establishing the Role</td>
<td>To adopt bimodal IT while allowing the IT unit to focus on the underlying infrastructure</td>
<td>To create a consistent customer experience across digital and non-digital channels</td>
<td>When enterprise business silos are limiting the impact of digital innovation</td>
</tr>
</tbody>
</table>

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10 Other researchers have recently identified additional CDO types, including entrepreneur, digital evangelist and coordinator (see Singh, A., and Hess, T., op. cit., March 2017). The digital accelerator encompasses the entrepreneurial spirit; the digital marketer has some characteristics of the digital evangelist but focuses primarily on developing digital marketing activities; the digital harmonizer to some extent is equivalent to the coordinator role but with a strong goal to streamline internal processes for achieving customer engagement.


The increasing demand from the business for digital innovation means that there are notorious tensions in some organizations between business units and the IT function.\(^\text{13}\) Even where there is no problem with alignment, IT departments often find themselves unable to keep up with the increasing demands from the organization.\(^\text{14}\) As a result, user departments are increasingly running their own digital initiatives.\(^\text{15}\) Doing this has become easier because of the availability of various social media platforms, cloud solutions, freeware or beta versions of software—technology that requires minimal up-front investment. Digital marketing strategies, in particular, often require little in the way of dedicated technology investments.\(^\text{16}\) Similarly, modern HR units must now use digital recruitment.\(^\text{17}\)

The challenges faced by large, preoccupied IT departments, the necessity of digital marketing, and other units like marketing and HR initiating their own digital innovation projects are all catalysts for adopting a CDO role.\(^\text{18}\) In many ways the CDO acts as a buffer between the business and the IT unit. The CDO complements the IT unit, focusing on end customers and integrating existing and new digital initiatives. As one of our interviewees (the CDO of a media publisher) pointed out, the CDO role is vital for an organization’s strategy:

“If you make it [the CDO role] a board-level function, there’s usually a strategy shift which comes with it as well, and there’s no such thing as a digital strategy. You just have a [business] strategy … if [in] 2015 … you did not take into account that the world is changing because of digital, then [you had] a bad [business] strategy.” CDO, Media Publisher 2

All CDOs are concerned with digital innovation and getting closer to the customer in the digital space. They also need extensive knowledge of digital technologies and an awareness of data analytics capabilities. In addition to building up their organizations’ digital capabilities, CDOs primarily lead the digital strategy. Such a strategy might be to partner with the “Googles and Watsons of this world,” as the CDO of a pharmaceutical company explained:

“We’re really scientific chemistry nerds, and we don’t have any ambition to be a technology company. In order to survive, we have to be very good at partnering with the top tech partners. [Without] … advanced analytics and digital capabilities … it would be very difficult to stay competitive [and developing those capabilities in-house would not be possible]. [But] if we partner with the Googles … or the Watson IBMs of this world, they have to be the best because [if they aren’t] they’ll lose … customers.” CDO, HealthRelated

There are various reasons why an organization may decide to adopt a separate CDO role, including:

- The IT department is preoccupied with large-scale infrastructural projects or is in a weak political position
- The marketing department has a rigid focus on traditional marketing methods, and there is no trusted relationship between IT and marketing
- The organization has many local digital initiatives but lacks a strategic digital direction.

However, there are also many instances where the need for a CDO is not apparent—particularly in organizations where CIOs have found a way to “ambidextrously” drive rapid-paced digital innovation while simultaneously attending to the IT infrastructure.\(^\text{19}\) For example, the CIO


of Hilti, which manufactures premium power tools, points out how his IT function manages to balance continuous experimentation with new technologies while still maintaining its primary focus on enterprise-wide process management.\(^{20}\) The IT function’s experimentation has led to a focus on application software for Hilti’s products, which has extended the reach of IT beyond the company’s internal systems and processes.

There seems to be a similar shift occurring with other top-performing CIOs. A recent survey suggests that CIOs of highly successful organizations pay close attention to external customers and maintain a strong focus on innovation.\(^ {21}\) These practices are consistent with the activities of CDOs in our research.

It is also important to note that CIOs provide a solid foundation for CDOs to build digital capabilities. Over the years, CIOs have established stable robust infrastructures that provide the platform for what CDOs are able to accomplish. Without integrated processes, data transparency and information management policies in place, CDOs would not have a good basis for scaling their initiatives.

Thus, we conclude that a new executive role is needed to fill specific gaps in an organization’s IT landscape. These gaps may be filled by existing executives (the CIO or the CMO) or by new digital executives (the CDO), but the key is to clearly delineate the space that the executive occupies. It is also important to define clear key performance indicators (KPIs) for all executives driving digital innovation. By clearly defining the roles of executives involved in digital innovations, it is possible to avoid situations where one person tries to navigate the whole digital transformation:

> “Someone has hired someone to fill what they perceived to be a gap. That person [finds] ... it’s hard to make things really happen because [they] don’t have ... the [authority] to influence directly IT execution, operations, marketing or whatever. Put it this way, if somebody was to offer me a job as CDO where there’s already a CIO, ... an operations person, ... marketing, and my job is to try to integrate all of these things, I would run for the hills.”

CDO, InsuranceFirm

Typically, IT-related skills and titles change rapidly. Even though CIOs have been around for decades, the role is still seen as ambiguous.\(^ {22}\) Thus, over time, the title “CDO” might evolve into other related roles, such as “chief innovation officer,” “director of emerging platforms,” “director of digital technologies” or “head of digital innovation.”\(^ {23}\) In some organizations, the CDO role may re-merge with the existing CIO role or with the marketing unit. Nevertheless, all current evidence points to a future where “digital” will remain one of the top priorities in organizations, and executive leadership for digital innovation will be needed in one form or another.

### Concluding Comments

We interviewed 35 CDOs from various industries. Our analysis is consistent with previous investigations that have found CDOs are central to innovative digital transformation efforts.\(^ {24}\) However, we have gone beyond previous work by reviewing a broader sample of organizations and identifying three distinct types of CDOs: digital accelerators, digital marketers and digital harmonizers. Digital accelerator CDOs mostly focus on establishing a digital innovation and experimentation capability; digital marketers emphasize data analytics; digital harmonizers focus on customer engagement. We categorized 13 of the 35 interviewed CDOs as digital accelerators, eight as digital marketers and 14 as digital harmonizers.

To provide a reference point for future studies, we have characterized these CDO types along three dimensions: key capabilities, objectives and reasons for establishing the role. The three CDO types differ along these dimensions and have distinct focal domains in which they build digital capabilities: digital innovation, data analytics and customer engagement. The distinction between CDO types and digital capabilities provides a framing for the role of future digital leaders, whatever their label might be. The CDO role is still emerging, and more and more organizations


Three Types of Chief Digital Officers and the Reasons Organizations Adopt the Role

may decide to adopt the role. Alternatively, the CDO role may, in time, transform into other roles. At present, it is not possible to say which route will be most popular. In the meantime, organizations should consider appointing a CDO as a way to capitalize on the potential of digital innovation, and we believe this article can provide guidance on deciding whether to adopt this executive role.

Appendix: Research Methodology

We conducted a series of exploratory interviews with CDOs from a sample designed to include as wide a variety of industries as possible. To ensure we spoke with firms that were first movers worldwide, we approached the founder of CDO Club (http://cdoclub.com), the company that established the first CDO network. We joined CDO Club on LinkedIn and started approaching CDOs who were members of the group. The job titles of all informants in our sample explicitly stated “Chief Digital Officer.”

As a result, we spoke with 35 CDOs from industries spanning automotive, financial services, healthcare, software, publishing, governmental and not-for-profit organizations in a variety of countries (see Table 1). The CDO role is fairly new, so most of our interviewees were in the first year or two in that position.

The data collection and analysis were iterative and emergent. After the first few interviews, we analyzed and coded the data, and used the initial codes in later interviews to contrast and compare further emerging themes. Since our study was exploratory, we aimed to find out what “digital” means; rather than providing definitions a priori our goal was to learn what digital meant from the CDO’s perspective.

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