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The Evolving role of Chief Digital Officer

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Abstract: Recently, many organizations are embracing digital transformation with the aim of improving business processes, improving customer relationships and improving organizational performance. In many instances, that effort calls for the search for a chief digital officer – someone who is as adept at business strategy and communication skills as they are at software capabilities. The digital transformation focus is mostly steered by the fact that organizations are not responding to challenges facing the market in a fast manner and thus failing to take advantage of the digital economy opportunities. This calls for appointment of a chief digital officer who mainly focuses on organization's digital future. Chief Digital Officers indeed play the role of digital transformation in an organization. In today's era, industries are experiencing rapid technological evolution hence creating opportunities and threats for new firm entrants, as well as established firms. Worldwide connectivity to the internet is driving the economy to a new digital era. The current Innovations from fast growing start-up such as Airbnb, Uber have disrupted many industries which position themselves with digital business models and quickly obtain a great market share from the already established industry players with traditional business models. On the other hand, information technology (IT) has become a tactical competitive advantage tool for many established firms and the role of the Chief digital Officer has gained a vast significance for the same reason

Many organizations have been forced to create the role of a Chief Digital Officer (CDO) to oversee the establishment of digital capabilities in the company following the invention of new digital technologies into nearly every aspect of business.

Keywords: Chief digital officer, digital transformation Chief Information Officer.

Background: The role of the Chief Digital Officer (CDO) has been rapidly evolving with many companies adopting digital transformation strategies. The chief digital officer role began close to that of the Chief Marketing Officer, with a focus on the digital customer experience. It has now evolved into innovation, corporate strategy, technology and operations. The Chief Digital Officer (CDO) is a C-suite role that is becoming prominent amongst businesses, as more organizations hire qualified professionals to be in charge of the digital transformation processes in the company. The CDO role first came into view several years ago and it was perceived that the role was evolutionary but some organizational leaders thought that the role may fade from prominence as soon as organizations complete their digital transformation process. Others, however, posited that an organizational digital transformation is an ongoing process, since new technologies are always invented. (Bassellier and Benbasat, 2004)

This implies that the role of the CDO may not fade, but it is practically evolves with time. Organizations, therefore, need to look for the right personnel (digital leaders) to fill these roles. The chief digital offices should have innovative thinking ability and also possess the ability to create it and execute it, while inspiring teams to embrace it with enthusiasm. CDO roles are evolving rapidly in every organization. The role of chief digital officer in the world's largest companies is on the rise. Businesses are changing their digital strategies thus appointing CDOs to shape holistic business-wide strategies. (Christensen and Overdorf, 2000)

Back in 2013 there was rapid rise in the use of Amazon, Uber and Airbnb. Organizations feared the potential power of digital disruption, and questioned whether the traditional IT leader was the right individual for the job. Some of the companies appointed CDOs to oversee a digital transformation project. KPMG director Peter Ironside says his firm's research suggests that when companies have appointed digital chiefs, half are dedicated CDOs and the other half are CIOs acting as CDOs. (Matt et al. 2015; Weill and Woerner, 2013a)

PwC consultancy practice Strategy reported that 19 percent of the world's 2,500 largest public companies had a CDO in 2017. In Europe, 38 percent of the companies had a CDO in the same year. Those figures truly reveal that the CDO has become a vital person in the C-suite, whose main role is digital transformation of organizations.

I. INTRODUCTION

Chief Digital Officer (CDO) is an executive who is in charge of digital customer experience. A CDO is also described as an executive who helps a company drive growth by converting traditional "analog" experiences to digital ones, and by overseeing operations in the rapidly-changing digital channels: mobile applications, social media and related applications, as well as web-based information management and digital marketing.

The main role of Chief Digital Officer (CDO) is to design and lead strategic digitization processes in organizations. There is growing interest across industries to introduce the role to embed the requisite knowledge and competencies and address the challenges encountered in digital transformation. Yet, some uncertainty surrounds the CDO role's responsibilities, given the ineludible overlaps with duties of the Chief Information Officer (CIO) and the Chief Technology Officer (CTO). The CIO and CTO are the linchpins in the technology industry. The focus of a CIO has always been on identification of problems as well as solutions related to an organization's existing technology infrastructure, thus serving as a facilitator among key internal stakeholders. On the other hand, the CTO role is more intrusive as it involves coming up with new technologies in line with and enhancement and the delivery of business strategy. In some organizations, the CTO or CIO may take on CDO responsibilities as a part of their job. For others, the CDO may emerge as a role with greater independence. The CDO role is very vital during the time of digital transition. The CDO role is perceived to be a more evolved role, combining elements of the CIO and CTO roles to achieve a mandate of embracing digital transformation throughout the organization. At Corinium's 2017 CDO Forum in Europe, a major theme was the necessary evolution of the CDO position. While there is still a focus on technical challenges—such as ensuring data quality, uses for data visualization, and specific emerging technologies—a number of sessions focused on organizational trends such as use of agile workforce practices to adapt technologies to make them more productive.

The CDO should be in a position to integrate various digital processes. Apart from having extensive technical expertise, a chief digital officer must also comprehend operations and organizational structures and processes. Such competencies will allow the CDO to approach technology from a design perspective and to convert data into a strategic asset in the organization. Effective CDOs are described by three key qualities. First, CDOs must challenge whether organizations are asking the right questions and directing solutions toward the right problem. In so doing, they must have the relevant knowledge of the industry and of company processes. Second, CDOs need to possess technical knowledge so as to select the best technology which suits their organizations. A CDO should negotiate with external vendors as well as the internal development staff in order to come up with digital solutions that fit with the company's specific needs. Third, CDOs must possess change management skills. They should be able to manage the change processes involved in the introduction of a new technology. They must understand well how the employees will cope with the digital technologies, the skills required as well as the challenges involved in technology-human interactions and how to curb them. Apart from the technical skills required for digital change, problem-solving and cultural awareness are equally significant competencies. CDOs need to negotiate with CEOs for budget to pre-train the employees for digital technologies. Effective CDOs will always find ways to change work processes so that technologies elevate work, and engage workers to use their knowledge and skills to improve the effectiveness of technologies as well as the organizational performance.

This continual evolution in the digital leadership role is as true for CIOs as it is for CDOs. Take Ian Cohen, who says his global CIO role at Addison Lee is more akin to that of a chief product and technology officer. These executives have end-to-end accountability for everything from their company's product propositions through to the technologies used to deliver them.

"This is an emerging class of business and technology leader," says Cohen. "Such roles require a sophisticated combination of an obsession with the customer experience, highly attuned business and commercial skills combined with a deep grasp of the technical and a pragmatic approach to getting it done."

II. DEFINING THE EMERGING CDO'S ROLE

The Chief Digital Officer (CDO) enables a seamless connected experience where the customer meets the enterprise and gets served through a variety of channels - generating revenue through better retention, cross-sell and up-sell and accomplishing the core mission of customer centricity. CDOs are in charge of the digital business strategy, online services across web, mobile and social platforms and oversight of enterprise content, applications and infrastructure.

The CDO is the executive overseeing the overall customer experience across touch points, lifecycle functions and application platforms. The customer interacts with the enterprise through a variety of touch points and channels. They also interact across the lifecycle through a variety of functions: sales, marketing, commerce and service. At the same time, the customer is an influencer and interacting with other prospects and customers through social media.

However, the clarity and definition of this critical role is quite varied and depends on the industry and size of firm. Take, for instance, the organizational structure. Should this role report to chief marketing officer (CMO) and be responsible for digital marketing, sales and commerce; or should it be independent of marketing and report directly to the CEO? Perhaps there is a dotted line responsibility for some aspects of marketing, IT and operations as related to the customer experience. Role clarity is also a challenge as boundaries and responsibilities are fluid. How is the CDO role different from the Chief Information Officer (CIO) and the Chief Technology Officer (CTO)? Every CIO needs to be more digitally oriented in order to be relevant. So where does the CDO role start and end? If customer experience is key, then should the CIO and CTO report into the CDO?

Despite there being no clear guidance on the approach an organization should take to leverage the power of digitization to achieve sustained competitive advantage, this has not inhibited practitioners from developing their own strategies, leading to a situation where practice is leading research. Principally, this has resulted in organizations adopting several governance initiatives in order to foster digital transformation, including the establishment of cross-functional digital leadership committees, cross-functional innovation groups, and the role of a Chief Digital Officer as a new C-level role (Fitzgerald et al. 2014). While the role of the Chief Information Officer has experienced many changes in the past, it appears that the presence of a distinct CDO role represents a marked difference from the way the CIO role has historically evolved, traditionally by expanding in scope and variety (Horlacher 2016). Interestingly, CDO positions are frequently created with a direct reporting relationship to the CEO (Horlacher and Hess 2016), which is something that CIOs have traditionally failed to obtain (Thibodeau 2011). The presence of a CDO represents a potential situation in which there may be duplication in the transformational aspects of the CIO role and the CDO role, potentially creating an inflection point in the role of the CIO. The coexistence of CDO and CIO also demands a demarcation of responsibilities, many of which would have traditionally become part or continued to be part of the CIO role.

Thus, we believe it is of significant importance that the logic behind the creation of the CDO role and the delimitation of roles and responsibilities between CIOs and CDOs is explored and explained. Existing research on the evolution of the CIO role over the past decades served as guidance and motivation for our research study, which puts the two roles in perspective and examines their future paths.

III. RESPONSIBILITY OF A CHIEF DIGITAL OFFICER

Since the chief digital officer position is still relatively new and evolving fast, many organizations will need to move beyond a vague, ill-defined, or outdated job description. Here are just some of the key responsibilities many organizations now consider for this role:

1. Setting and Implementing Digital Strategy:

Develop a clearly-defined and compelling digital strategy for the company's future and ensure that all relevant digital initiatives are fully integrated into the strategic-planning process for leadership commitment, resource allocation and execution

2. Serving as a Cross-Functional Change Agent:

The CDO must be the company's central leader and integrator in the digital transformation process, serving as an intermediary between all other executives and functions in the rollout of digital initiatives and capabilities, fully integrating business and technology, and closing digital performance gaps that exist in and between the various functions and business units of the organization

3. Driving Digital Innovation:

The CDO should always work with teams across the business to generate innovative digital solutions for products, services, processes, customer experiences, marketing channels, and business models. The CDO should own and centrally monitor the digital innovation project portfolio, while deployment of the individual projects may rest with other executives and teams

4. Measuring ROI on Digital Projects:

Digital innovation and transformation initiatives should create value by, for example, improving customer engagement and loyalty, driving new revenues, or achieving new efficiencies. Since these results are measurable, the CDO should monitor and report on the ROI outcomes of digital projects and investments – linked to enterprise KPIs – with the goal of demonstrating the positive impact from these initiatives

Expanding the Digital Innovation Ecosystem: Build, manage and continue to grow an internal and external digital innovation ecosystem, tapping into competencies across and beyond the organization (in an external partner network) to apply digital technologies to the business

5. Developing Digital Talent:

The demand for digital innovation and transformation is currently outstripping the supply of qualified talent in the market and inside organizations. The CDO must therefore work closely with HR to attract and retain top talent, and to build digital capabilities across the company

Other job titles in the same ballpark: the other CDO -- the chief data officer -- who is responsible for the organization's data strategy (and security) and the chief technology officer (CTO), who is mostly tasked with understanding deeper technology trends and opportunities.

CDOs may also have relationships beyond the IT department; in particular the link between the CDO and the chief marketing officer (CMO) is another one to watch, as many digital initiatives have traditionally been initiated by the CMO in the past. There's also the other CIO -- the chief innovation officer -- to throw into the executive alphabet soup, although this role is most likely looking at future potential rather than using digital to rethink existing business processes and structures.

IV. DIGITAL TRANSFORMATION

According to Bharadwaj (2000); Melville et al. (2004); Porter (2008), IT innovations have historically been portrayed as one of the main contributors to the creation and maintenance of a firm's competitive advantage. However, with the rising

technological innovations and the rapid adoption of digital end customer products and services, organizations are focusing on ways of effectively exploiting the power of digital innovation (Bharadwaj et al. 2013a). This is regularly conceptualized as various diversifications of information, communication, computing and connectivity of technologies, which have great impact on business strategies, processes, firm capabilities, product and service offerings, and key inter-firm relationships. This in turn enables the organizations to have a competitive advantage (Bharadwaj et al. 2013a). With respect to IT strategy, there is a fundamental shift in the orientation of business strategy where historically it was perceived that alignment occurred by first formulating business strategy, with the IT strategy being formulated subsequently (Henderson and Venkatraman 1993).

On the other hand, the recent focus on using digital technologies to guide the firm's strategic direction represents a change away from this approach, with the focus on establishing an attractive position in the digital ecosystem, which effectively enables companies to explore and exploit digital technologies (Pagani 2013). This creates challenges and opportunities for new as well as established firms, specifically in regards to the formation, establishment, and disruption of business models where the boundary between business and IT strategy is increasingly blurred (Bharadwaj et al. 2013a). In order for incumbent businesses to take advantage of the opportunities that an increased focus on digitization affords them, they must undertake a digital transformation journey, often altering corporate culture in order to open the organization to new digital opportunities (Fitzgerald et al. 2014).

IS research has not yet thoroughly examined how organizations are able to take advantage of this digital focus, especially from an IT leadership perspective, with the extant literature, as discussed above, still lacking clarity concerning the role of the CIO as well as lacking firm guidance on how CIOs should respond. Digital transformation needs "Systems of Intelligence", in other words a modular SOA led architecture at the foundation of the organization that is connected through 'DATA Feedback Loop'. An organization that can have endless channel for customer, partner, employees and its operation to engage, supported by variety of business processes and digital application that could be assessed and interacted. Most importantly they are connected through 'Data' with added intelligence of Machine Learning.

The CDO role is the foundation to create "System of Intelligence" or "A connected data company". CDOs need to strategize the organization to create smart modular application eco system supported by data foundation and machine learning technology that uses historical and real-time data to make predictions and decisions that deliver rich, adaptive, personalized experiences for users



V. THE ROLE OF THE CHIEF DIGITAL OFFICER IN DIGITAL TRANSFORMATION

The focus on Digital Transformation initiatives has never been greater. Organizations are increasingly looking to make sure their business strategies are underpinned by the right technologies and that lack of digital maturity isn't stopping them when making key business decisions. According to Gartner, CEOs expect their digital revenue to increase by more than 80 per cent by 2020, while IDC expects the percentage of organizations with digital transformation initiatives to grow from 22 per cent today to almost 50 per cent in the next four years.

It comes as no surprise then that some industry figures have been calling for the creation of a new C-level role – namely Chief Digital Officer (CDO) – a digital transformation evangelist who would take responsibility for all things digital. While their enthusiasm to embrace a digital agenda should be commended, it opens up an interesting debate. Do organizations really need a separate figure to drive digital leadership and what does that tell us about our Chief Information Officers (CIOs)?

A challenging transformation

The focus on digital transformation is, in many cases, fuelled by concerns that companies are not responding to market challenges quickly enough and thus missing out on opportunities presented by a rapidly growing digital economy. Hence, calls for appointment of a CDO often stem from insecurity about a company's digital future. No wonder that hiring a digital guru, focused solely on driving organisations' digital maturity seems like a no-brainer.

But aren't CIOs the ones that are supposed to be thinking about how to best use technology and information to improve customer service, drive more revenue and open up new markets? In theory – yes. In reality, not all CIOs operate in that way or in fact have the resources that would enable them to focus on digital transformation initiatives. Add to this the fact that many mid-sized organizations might not even have a CIO and the confusion grows.

And since digital disruption is about much more than just technology, spanning business strategy, processes management and company culture, it often poses a significant challenge for organizations. It involves putting together governance frameworks that enable companies to mitigate risks involved with innovation, designing new operating models that can make the most of emerging technologies, vendor management, and finding and managing the right talent to do the job – responsibilities that would ultimately fall to the CIO.

Making the right choice

In addition, organizations are often confused about who should be owning digital projects – the IT department, marketing, a dedicated digital team or a blended team from across the business. In such scenarios, adding a CDO to the management mix makes perfect sense. A separate CDO could give the CIO some much needed breathing space and help the organization refocus on digital initiatives. He or she would support the CIO in communicating the value of digital to the rest of the C-suite and help inspire confidence in company's digital ambitions. In other companies, where the CIO has a broader remit, the role could be provided by the CIO or merged into a CIO/CDO role under one person in the future. In many mid-sized organizations, where the role of the CIO might not exist, putting a focus on driving digital across the entire organization, rather than giving that responsibility to one person, might make more sense. One thing is certain – hiring a CDO solely as a box-ticking exercise won't further a company's digital agenda and can do more harm than good.

The biggest mistake to avoid is isolating the CDO or treating his or her responsibilities as separate from the rest of the organization. For digital transformation to take place, it's crucial that CDOs work hand in hand with CIOs, driving digital leadership from the top and across each department, project and team. Ultimately, the need for a separate CDO comes down to the type of organization and the type of CIO currently in place but one thing remains clear – a fresh injection of digital know-how, if well thought-through, is never a bad strategy for companies looking to invest in digital transformation.

However, it's worth noting that the precise responsibilities of each CIO, CTO and CDO will vary from organization to organization. And not every organization would have all these job titles in their leadership team, of course.

VI. SIGNIFICANCE OF THE RESEARCH

The reason for the evolution of chief digital officer is found in a company's need (or desire) for digital change. Those getting started with their digital journey tend to focus on smaller activities, often limited to individual business units or with isolated goals in mind, such as improving customer-facing interaction, say the study's authors. In these cases, marketing, sales and customer service executives often possess the knowledge and drive to needed to accomplish the change.

When it comes to a larger or more holistic approach to digital transformation, however, businesses require an "executive with a strong background in technology as well as experience in navigating the often fraught political and governance issues involved in approving major technology investments and implementing the new systems".¹

This expertise is of particular importance when it comes to negotiating the landscape of legacy systems. Put frankly, merging new technology with old may require a strong history of technological implementation that marketing and sales executives are unlikely to have.

The following are five areas CDOs themselves must get right if their organizations are to successfully transition to digital.

1. Make digital integral to the strategy

Many companies are focused on developing a digital strategy when they should instead focus on integrating digital into all aspects of the business, from channels and processes and data to the operating model, incentives, and culture. Previous analysis of how companies with a high Digital Quotient (DQ) operate shows that 90 percent of top performers have fully integrated digital initiatives into their strategic-planning process.

Getting the strategy right requires the CDO to work closely with the CEO, the chief information officer (CIO), business-unit leaders, and the chief financial officer; the CDO also needs to be an active participant in and shaper of the strategy. An important foundation for CDOs to establish credibility and secure a seat at the strategy table is providing detailed analysis of market trends and developments in technology and customer behavior, both inside and outside the sector.

2. CDOs need to bring a bold vision

65 percent of companies that are "digital leaders" have a high tolerance for bold initiatives; among average performers, 70 percent of companies don't see support for risk taking. This vision could include starting new businesses, acquiring technologies, or investing in innovations—one CDO we know made it his mantra to drive agile as a new software-development methodology for 40 percent of the company's projects. No matter how it's branded, CDOs need to be known within their organization for something that is courageous, new, and adds value.

In addition, CDOs must be specific about their goals. One international publishing house, for example, set a target of generating 50 percent of its revenue and profit from digital media within ten years, and it wound up doing so in almost half that time. Similarly, several banks that set the objective of increasing digital-channel sales to more than 50 percent are seeing that specific and measurable goal rally the organization.

VII. METHODOLOGY

The 2019 Chief Digital Officer study identified the world's 2,500 largest public companies, defined by their market capitalization (from Bloomberg) on March 31, 2018. In this study, a CDO is defined as that executive, whose responsibility is to develop and implement the company's strategy for the digital age. Independent of the title set by the firm, the function of a CDO is to lead the company throughout its cross-functional transformation to a digital enabled enterprise. CDOs were identified using electronic sources in many languages such as company and executive directories (Thomson Reuters, BoardEx), corporate homepages, business network platforms (LinkedIn, Xing) and press databases (Factiva). The

defined industry segments, geographic regions, CDO backgrounds and company market cap are Strategy&-customized classifications.

Acquiring digital competence has been a key objective for most of the world's largest companies for some years. And a key way to go about doing so has been to appoint a chief digital officer (CDO) to lead the digital agenda. Going digital is, of course, still important. But we've noticed recently that the means of achieving that transformation have started to change: namely, fewer companies are appointing CDOs. Leaders at many companies now believe that putting a single person in charge of digital transformation may not be the best approach, because it is an intrinsic strategic priority across the whole business as agility becomes critical to survival. The CDO role no longer leads a discrete function.

At the same time, companies that already have a CDO have changed their expectations of this role: First, because the role has become much more transformative across the whole company, the CDO should work across functional silos. Second, there is need to change legacy systems and implement new technologies, which means that the CDO must have the appropriate technology background

In a CDO study conducted back in 2015, the evolution of the CDO role was plotted in line with companies' need to adapt (to digital), to disrupt (their organizations), and to transform (their whole business). It is now evident that in just three years, digital decision making has already been elevated to the board level in many cases. More than half (54 percent) of CDOs have board-level status today, up from 40 percent in 2016. This reflects the growing recognition that the digital transformation agenda now has strategic importance to most organizations, and that, unless it is driven from the top of the enterprise, it will not have the required momentum to drive business change.

Once a digital transformation plan has been formulated, it needs to be implemented, and many companies realize that this process will involve much more than they initially thought. New technologies need to be introduced, for sure, but legacy systems also need to be revamped, internal processes changed, and employees persuaded to adapt to new ways of working — all of which cuts across a company's organizational silos. It is often at this moment of realization that the CDO role is elevated to the board level, with capabilities that enable transformation across those silos.

Previously, CDO roles tended to be filled by people from market-facing functions, including marketing, customer services, sales, or distribution. Now, however, organizations are increasingly seeking CDOs with strategy and technology backgrounds — those who are able to work at the C-level across functional silos and who are capable of understanding the disruptions enabled by technology.

The latest CDO study found that CDOs with a market-facing background had dropped to 18 percent, down from 39 percent two years ago, and that 41 percent of organizations had attracted CDOs with a solid technology background, up from 32 percent in 2016. And 28 percent had a strategy, business development, or consulting background — a surge from 2016, when just 21 percent had such credentials. Indeed, a key study finding was that a third of CDO positions saw turnover in 2018. This reflects the need for new skill sets and experience as digital transformation programs move beyond pilots in specific corners of the business to play a central part in everyday operations.

But where organizations have a CDO in place today, the priority should be to ensure that the person in this role still has the appropriate perspective and capabilities to move the digital transformation agenda forward, by embedding it both deeply within operations and at scale across the organization. If things at a particular company are progressing as hoped, there is no need to rock the boat. But it will be important to review the situation periodically to check that the CDO has the right skill set and continues to add value in the right places.

Where there is no CDO role at present, it may be worth thinking twice about creating one now, especially if the top team already has a good combination and concentration of talent and experience. Certainly, no member of the C-suite can expect to do justice to their own remit without a digital mind-set and positive momentum for change.

CDOs are being implemented primarily as a change agent as older traditional businesses work to transform themselves to a digital world. For this reason, some argue that the CDO might just be a "transformational phenomenon." The answer however is yes according to Gartner Analyst, Dave Aron's recent blog post, "The Chief Digital Officer is emerging and maturing as a role fast." According to Gartner's data, only 6 percent of companies have a Chief Digital Officers at the time of this article, but they are "springing up faster than we can count them," says Aron.

Some of Gartner's key findings in their research on the CDO role include:

1. The early CIO survey evidence suggests that just fewer than 40 percent of Chief Digital Officers are strategic advisors to the board and CEO on digital business strategy, just over 40 percent are digital marketing officers, and the rest have other digital-related roles.
2. Companies and public sector agencies that have Chief Digital Officers are much more focused on growth (relative to cost efficiency) than their counterparts without one
3. Companies that have Chief Digital Officers are three times as likely to do more in-sourcing next year.

VIII. DISCUSSION

The new position of Chief Digital Officer (CDO) has been created to design and lead strategic digitization mandates in organizations. There is growing interest across industries to introduce the role to embed required knowledge and skill-sets and address the challenges of digital transformation. Yet, some uncertainty surrounds the role's responsibilities, given inevitable overlaps with duties of the Chief Information Officer (CIO) and the Chief Technology Officer (CTO). The CIO and CTO are mainstays in the technology space. The CIO has traditionally focused on problems and solutions related to a company's existing technology infrastructure, serving as a facilitator among internal stakeholders.

The CTO role is more outward-looking, involved in bringing new technologies in that align with and enhance the delivery of business strategy. No two org charts or reporting arrangements look the same. For some companies, the CTO or CIO may take on CDO responsibilities as a part of their job. For others, the CDO may emerge as a role with greater independence. Wherever the CDO resides, it is critical for this time of digital transition. The CDO should be understood as a more evolved role, combining elements of the CIO and CTO roles to achieve a mandate of overarching digital transformation throughout the organization.

At Corinium's 2017 CDO Forum in Europe, a major theme was the necessary evolution of the CDO position. While there is still a focus on technical challenges—such as ensuring data quality, uses for data visualization, and specific emerging technologies—a number of sessions focused on organizational trends such as use of agile workforce practices to adapt technologies to make them more productive.⁸ Our vision of the CDO role draws on these ideas. The CDO will need to be a digital integrator. Beyond extensive technical expertise, he or she must also understand operations and organizational considerations. Such a mix of skills will allow the CDO to approach technology from a design perspective and to convert data into a strategic asset.

Effective CDOs are marked by three key qualities. First, CDOs must challenge whether organizations are asking the right questions and directing solutions toward the right problem. To do so, they must have domain knowledge of the industry and of firm processes. Second, CDOs require technical knowledge in order to select the best technology for their organization. An effective CDO will negotiate with external vendors or internal development staff to design digital solutions that fit with the firm's specific needs. Third, CDOs must manage the change processes involved in introducing new technology. To do so, they must understand how the workforce will interact with the digital technologies, the skills required, and the challenges involved in technology-human interactions. While business schools and workplaces emphasize the technical skills required for digital change leaders, problem-solving and cultural awareness are equally important skills. Consider that CDOs will need to negotiate

with CEOs for budget to pre-train the workforce for digital technologies. Effective CDOs will find ways to change work processes so that technologies augment work, and engage workers to use their knowledge and skills to improve the effectiveness of technologies.

IX. CONCLUSION AND FEATURE SCOPE

Successfully incorporating today's digital technologies requires companies to operate in new ways. However, research by MIT SMR shows that being able to effectively incorporate digital strategy is strongly associated with a company's overall digital maturity.

In summary, the position of CDO is not defined by infrastructure or hardware like the CIO and CTO roles, but instead it is defined by customer experience, productivity and innovation. The focus is on the outcome – customer acquisition, engagement and retention.

The role of a Chief Digital Officer (CDO) may be tougher than one would expect. To be successful this role will require the leader to bridge the unique aspects of a particular industry, the nuances of the digital customer experience in that industry, and the necessary engineering savvy and know-how to build WOW experiences.

Some organizations appoint one or more CDOs (Chief Digital Officers), whose responsibility is developing digital strategies. In many types of companies, the CDO focuses on client and customer satisfaction, retention, service, loyalty and the customer life cycle. In addition to the customer centric experience, many organizations also charge the CDO with digitalization of the value and supply chains.

In today's world, conventional organizations to have overcome legacy systems and processes in order to facilitate the experience their customers have come to expect. Building and implementing a plan to do this seems to be the common theme and

CDOs who have the strongest capabilities connecting digital investments to enterprise KPIs are in a better position to achieve positive digital transformation.

The changes that will be accompanied by digitalization can be orchestrated under the guidance of a suitable CDO. However, this requires the support of the entire company, since digitalization is not an isolated process, but rather affects many parts of the business. This means that every member of the top management team must be integrated into the company's digital restructuring processes so that everyone can make their own contribution to digital transformation in the company.

Furthermore, it must be clearly clarified which responsibilities and resulting obligations and rights a CDO in the company receives. Based on this, the special managerial functions and tasks of a CDO can finally be clearly defined within the framework of the digital transformation. It is ultimately decisive how the company wants to digitalize and whether it wants to perform a complete or "only" partial digital transformation.

This paper contributes significantly to CDOs, and those responsible for implementing these roles and hiring executives for the respective positions, as they seek to clarify the different types of digital leadership roles in order to derive maximum long-term value for the firm. Our study can serve practitioners as a basis for discussion on the importance of acquiring and the establishment of a CDO role in an organization.

Additionally, CDOs can utilize the study results as impetus for discussions with their peers on effective digital transformation and the challenges they are facing. Furthermore, our research can be used as a foundation for executive education courses and to facilitate discussion in communities of practice.

Companies that are digitally transforming their business should be particularly mindful about, and observant of, changes in the split of roles within their C-suite. Specifically, executive teams without a CDO in their ranks should discuss the need for a

CDO and periodically assess changes in the forces from the four driving factors that determine this need. Eventually, organizations should have a plan to migrate digital transformation responsibilities over to different business executives, which implies deliberate continuous change to CDO roles.

Future research should investigate potential correlations between IT outsourcing and the CDO role phenomenon. To understand the CDO role and its context better, we further suggest to include the CDO's department size (e.g., number of staff members) in future studies. With research on the impact of digital transformation on executive roles still in its infancy, this study's contribution is an impetus for future research to investigate the concepts developed in more depth. Moreover, there is a broad range of additional research areas, such as business-IT alignment and IT governance, which might be affected significantly by the evolving changes around digital transformation responsibilities and executive roles.

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