IT Leadership in Higher Education, 2016: The Chief Data Officer
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Introduction

Institutions of higher education produce vast quantities of data. Even excluding the data produced by research efforts—which is a lot to ignore—institutions produce an immense volume of operational data. These data come from every unit on campus: student data from the registrar and from academic departments, employee data from human resources, data about network and technology usage from the IT unit, data about vendors and contracts from all campus units, institutional research and assessment data, federal and state compliance reporting data … to name only a small portion of the types of data that may be collected at an institution of higher education.

Higher education is of course not the only sector swimming in data. Almost all industries are, these days. This has led to the development of a relatively new position in the “C-suite”: the chief data officer (CDO). According to two separate reports, the number of large enterprises that have hired a CDO has more than doubled since 2012. In 2014, Gartner projected that by 2015, 25% of large global enterprises will have appointed CDOs. In 2016, NewVantage Partners reported that 54% of Fortune 1000 firms employed a CDO. CDOs are more common in some industries than in others. Sectors in which the largest percentage of organizations have hired a CDO fall into two categories: industries in which a great deal of data are generated simply by daily operations (e.g., financial services, telecommunication, information technology), and industries with significant regulatory requirements (e.g., utilities, health care, pharmaceuticals). Higher education falls into both of these categories: All institutions of higher education generate a great deal of operational data, and many have significant regulatory requirements, particularly public institutions. However, few institutions of higher education employ a CDO.

This means that the size of the CDO population in higher education is small, thus limiting the size of the respondent pool for this survey. In fact, only 29 senior CDOs completed the survey. While this is not an adequate sample for drawing statistically significant conclusions, it is adequate for enabling us to begin to understand the nature of the role. In lieu of statistical robustness, ECAR worked closely with data and analytics subject-matter experts to summarize the survey findings in a directionally accurate manner.

As part of its series of studies of the IT workforce in higher education, the EDUCAUSE Center for Analysis and Research (ECAR) conducted a survey of CDOs. This study sought to identify the characteristics and functions of CDOs: What background and training do these individuals possess, what is their scope of work and responsibilities, and what personal and professional characteristics...
contribute to their success? The audiences for this report are CDOs themselves, those who aspire to be CDOs, and those to whom CDOs report. This report can help all of these stakeholder groups understand the job of the CDO—at their local institution and elsewhere—and compare it with a higher education–wide “baseline.”
Key Findings

- Those performing the functional role of the highest-ranking data and analytics leader on campus have a wide range of job titles. A minority have the actual title chief data officer, while a majority have the title director.

- CDOs report to a wide range of positions in their institution’s leadership. CDOs most commonly report to the CIO but also report to nearly every other leadership position in higher education.

- Many CDOs have dotted-line reporting relationships with other institutional leaders. These informal reporting relationships are one of the ways in which CDOs exert influence across the institution.

- CDOs have a very broad scope of responsibility. The most important areas of CDOs’ responsibility are the use of data to support decision making, data visualization and “data storytelling,” and the communication of these data throughout the campus community.

- Data and analytics work is both strategically important and politically sensitive. This work requires close collaboration with all campus units, yet data—which may expose political issues—are often seen as an institutional asset at the highest level.

- CDOs are overwhelmingly hired from within their current institution. CDOs primarily come from other positions related to data and enterprise IT. The median length of CDOs’ careers in higher education is over a decade, but the median duration in their current position is only two years.

- The CDO position is the most gender-balanced of the IT workforce positions studied in this report series. Even so, the gender balance of CDOs is three to one, male to female. CDOs are also younger than individuals in other IT leadership positions, with a median age nearly a full decade below that of any of the other IT workforce positions studied in this report series.

- The job of CDO requires a highly diverse skill set. CDOs consider skills that involve conducting and presenting institutional data analysis—and the tools that enable this analysis—to be most important for their success, and these are the skills in which they report being strongest.

- There are significant opportunities for professional organizations to engage in outreach and promotion of professional development opportunities for CDOs in higher education. Few CDOs hold professional certifications, even though many exist that focus on data and analytics. Furthermore, CDOs consider almost all skills related to data and analytics to be important for their success but consider themselves to have high levels of expertise in only a few of these areas.
The Chief Data Officer at the Institution

In its study of CDOs in large corporate enterprises worldwide, Gartner found that most have the actual job title of chief data officer. The current study of institutions of higher education, however, found quite the opposite. ECAR’s survey asked for responses from “the highest-ranking data and analytics leader, or CDO”—a broad functional role rather than a specific job title. And chief data officer was not, by a long shot, the title held by most of our respondents. Indeed, only four respondents (14%) have the actual job title of chief data officer. On the other hand, 21 of 29 respondents (72%) hold the title director of something: director of institutional research, director of institutional effectiveness, director of business intelligence, director of enterprise data and analytics, and others. Figure 1 shows the wide range of job titles held by respondents. The categories reflect broad areas of responsibility for any institutional leader; the common terms in the titles are color-coded by their frequency in our respondents’ job titles. Please note that a single job title may reflect more than one area of responsibility, and several respondents had multiple job titles, which is why the sum of these categories is greater than the number of survey respondents.

<table>
<thead>
<tr>
<th>Category and frequency</th>
<th>Common terms in title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership</td>
<td>DIRECTOR  PRESIDENT  SENIOR</td>
</tr>
<tr>
<td></td>
<td>OFFICER  HEAD  MANAGER  MANAGEMENT  CHIEF  EXECUTIVE</td>
</tr>
<tr>
<td>Data &amp; Analytics</td>
<td>ANALYTICS  RESEARCH  DATA  INTELLIGENCE  EFFECTIVENESS  INFORMATION</td>
</tr>
<tr>
<td>Institution</td>
<td>INSTITUTIONAL  BUSINESS  ENTERPRISE  UNIVERSITY</td>
</tr>
<tr>
<td>Operations</td>
<td>APPLICATIONS  STRATEGY  SERVICES  SUPPORT  SYSTEMS</td>
</tr>
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Figure 1. Job titles of individuals doing work related to data and analytics
Despite this variety in job titles, the acronym CDO in this report refers to the individual doing this work at institutions of higher education. While this abbreviation may not reflect most actual job titles, we include these individuals in the C-suite to reflect their scope of responsibility, as will be discussed below.

In the face of this wide variety of job titles, it is interesting to note that almost all respondents believe their title accurately reflects the scope and nature of their responsibilities. Only four respondents believe otherwise, and only two of those suggested a more accurate job title: associate vice president, in both cases.

**Reporting Relationships**

In addition to the wide range of CDOs’ job titles, there is also great variety in CDOs’ reporting relationships. The largest group of respondents report to the highest-ranking technology officer (CIO or equivalent position), though this is still less than half of respondents. The rest of our respondents report to presidents, chancellors, vice presidents, associate vice presidents, vice chancellors, and vice provosts, among other positions. Indeed, there seems to be hardly a leadership position in higher education that some CDO does not report to.

Respondents who report to the CIO are evenly split between those who agree that the CIO is the appropriate report for them to have and those who believe they should report to a different position. Unfortunately, there is very little agreement among respondents about which different position this should be. Furthermore, respondents who report to a position other than the CIO almost uniformly agree that the appropriate reporting relationship is for them to report to a position other than the CIO. However, there is again little agreement about which non-CIO position this should be, because, in fact, it is mostly not the position to which the respondent reports.

Why is there so little agreement among CDOs about the appropriate reporting relationship? It’s difficult to answer this question from so little data. But following the question about which position respondents think they should report to, respondents were asked why they think so, and the responses to this question are illuminating. One CDO who reports to the CIO and thinks this is the appropriate reporting relationship wrote that this enables a close collaboration with the IT unit. One CDO who reports to the CIO but thinks they should not, however, warned that this reporting relationship risks promoting the false impression that data collection and analysis is strictly driven by campus IT functions. Yet another wrote flat out that data should be an asset “curated at the highest organizational level,” implying that the campus IT unit is not high enough in the institutional hierarchy to reflect the strategic importance of data. In a similar vein, one CDO who reports to the president and thinks this is the appropriate reporting relationship wrote that their unit works on strategic projects at the institutional level. Another wrote that analytics in higher education must span both the
academic and business sides of the institution. Other CDOs wrote that analytics “exposes politically sensitive issues” and that reporting to the president or vice president would therefore provide “neutral ground” for this work. In short, CDOs have such a wide range of reporting relationships and so little agreement about what is the most appropriate reporting relationship because the work is seen as both strategically critical and politically fraught, and it is unclear where work of that nature best fits into the institution.7

CDOs have a wide range of reporting relationships both up and down the institutional hierarchy. About a quarter of respondents have no reports, either direct or indirect. On the other hand, about a third of respondents have 15 or more total reports (direct and indirect). The median number of total reports that CDOs have, overall, is 3, but two of our respondents have a whopping 35 total reports. This many reports seems to indicate a department. This conclusion is supported by the fact that all 5 of our respondents who have 20 or more total reports are at very large8 doctoral institutions—that is, institutions that are likely to have the resources to fill an entire department with people dedicated to data and analytics work.

As a follow-up to the questions about reporting relationships, respondents were asked an open-ended question about how their position fits into the leadership structure at their institution. As if the diversity of positions to which CDOs report isn’t broad enough, several respondents wrote that they additionally have dotted-line reporting relationships to various positions, mostly vice presidents and vice provosts. And this complexity extends both up and down the institutional hierarchy. One respondent, for example, wrote that they have no direct reports but “rely heavily on cross-functional team members from across campus.” The wide range of both direct and dotted-line reporting relationships quite likely aids CDOs in exerting influence across the institution.

And CDOs need all the help they can get in exerting influence across the institution, since by and large they do not have a great deal of formal influence. Only 17% of our respondents are members of the president or chancellor’s cabinet at their institution, and just over a quarter of our respondents attend meetings of the institution’s board of regents or board of governors (combining those who are required to attend every meeting and those who attend on an as-needed basis).

The picture that emerges here of the CDO role is a complex one: a remarkably broad range of reporting relationships, both formalized and informal; generally few staff; and generally little formal interaction with institutional leadership. Given these limitations, one might expect CDOs to feel hampered in their influence at the institution, but by and large this is not the case: Most CDOs say they have significant influence at their institution. Where does this influence come from? In part, it comes from the CDO’s broad scope of responsibility.
Scope of Work

The role and scope of work for CDOs vary across those business-sector firms in which they have been studied. The purpose of this section, however, is to address the role and scope of work of CDOs in higher education. In very broad strokes, the CDO is responsible for capturing, storing, and managing all necessary data; identifying when and how data can be used to support decision making within the organization; and ensuring that data governance processes are in place to enable data-based decision making. The reason for the CDO to engage in these tasks is to serve the organization's need for “defensive practicality and offensive transformation”—in other words, managing daily operations and reporting requirements, and managing change in the face of a changing environment. Naturally these tasks must involve many stakeholders from all across an organization. But the CDO is the “point person,” so to speak, who directs and has influence over all tasks related to data and analytics.

Areas of Responsibility

What accounts for CDOs’ remarkably high level of perceived influence at their institution may be their equally remarkably broad scope of responsibility. Respondents were asked a set of three questions about their responsibilities, with 20 possible responses (plus an “other” option) for each question:

1. What areas of data oversight or management are you currently responsible for at your institution?
2. Are there any areas of data oversight or management that you are but should not be responsible for at your institution?
3. Are there any areas of data oversight or management that you are not but should be responsible for at your institution?

The first thing of note in the responses to the first question, about current scope of work (shown in figure 2), is that CDOs are responsible for almost everything we asked about. All but one of the response options (aside from “other”) were selected by at least a third of respondents. The one area of responsibility that fewer than a third of CDOs are responsible for is data/information security and services—an area that at many institutions falls within the scope of another position entirely, the chief information security officer.
Several themes appear within the top 10 areas of responsibility—those areas for which the most CDOs are responsible. (Though given CDOs’ broad scope of responsibility, cutting this list off at 10 is arbitrary.) The first of these themes, perhaps unsurprisingly, is the use of data to support business decision making: analytics, business intelligence, predictive modeling, and statistical analysis.

Next is the interpretation and communication of this data, which of course is critical in using data to support business decision making: data visualization and data storytelling (the latter is 11th in the list of responsibilities). Finally, there is the theme of management of data: data governance and data warehousing. A study of CDOs in financial institutions, conducted by PricewaterhouseCoopers, asked what the core responsibility is of the CDO. Seventy-seven percent of
respondents said that their core responsibility is data governance, a finding that PwC interprets as indicating “that most CDO roles are still in the early stages of development, as governance provides the structure that helps enable” other activities related to data and analytics. It is therefore worth noting that about two-thirds of the respondents to the current study are responsible for data governance, perhaps an indication of the maturity of the CDO position in higher education, at those institutions that have such a position.

Figure 2 shows the areas of data oversight or management that CDOs are currently responsible for at their institution, as well as areas that CDOs believe they should not be responsible for and those they are not but believe they should be responsible for. This figure clearly illustrates the large number of areas for which CDOs are responsible, as well as the very few areas they would give up.

The two questions about misalignment in respondents’ current scope of work received far fewer responses. This is first of all a function of our small number of respondents. Very few CDOs would give up any of their current areas of responsibility, though a greater number would take on responsibility for areas for which they are not currently responsible.

In particular, CDOs are loath to give up any areas of responsibility: The question about areas that the respondent is but should not be responsible for received almost no responses. Only four areas were selected, each only once and by three different respondents: data governance, data or analytics vendor relations, education across the organization about data management policies and procedures, and student success metrics. It is easy to see why some CDOs might consider the latter three to be outside their scope: Vendor relations may appear to be the responsibility of the individual accountable for the solution architecture for a particular system, educating the organization about policies may appear to be the responsibility of the CIO, and student success may appear to be the responsibility of individual academic units. It is more difficult to imagine who should have responsibility for data governance and data mining, however, if not the CDO.

Several other CDOs apparently think so too, as data mining was one of the areas of responsibility that several respondents are not currently responsible for but believe they should be. Indeed, this and institutional research were tied for first place, with five respondents each staking claim to these areas. It is especially noteworthy that several CDOs who are not responsible for institutional research believe that they should be, since at four out of the five institutions at which these CDOs are employed (as on many campuses), the Office of Institutional Research is an independent unit. Similarly, three respondents are not currently but believe they should be responsible for student success metrics, which at many institutions is distributed across academic units, aligned with the assessment and accreditation of individual programs. On the one hand, it would be easy to see these responses as a desire for a land grab by these CDOs. On the other
hand, bear in mind that, as discussed above, it is not clear where CDOs best fit into institutional hierarchies in higher education, and some CDOs do in fact have responsibility for institutional research and student success metrics—some even for both. Furthermore, one’s scope of responsibility changes over time, even if one’s job title remains the same: Effective CDOs may be able to convince other institutional leaders that these areas of responsibility should be under their jurisdiction. Alternatively, CDOs may exert influence in these areas, even without explicit responsibility.

Almost all of the few areas that some CDOs would give up, others would take on: data governance, education across the organization about data management policies and procedures, and student success metrics. And the same themes found within the top 10 areas of responsibility are found here as well, in the areas that respondents are not currently responsible for but believe they should be: the use of data to support business decision making (business performance metrics, statistical analysis, decision support systems), the interpretation and communication of data (data visualization and data storytelling), and the management of data (database architecture and data governance).

**Time on Tasks**

The 20 possible response options to the questions about areas of responsibility were aggregated into a smaller set of 7 broad activities (plus an “other” option) to which CDOs could allocate time. Figure 3 presents the percentage of time allocated by CDOs to these various activities: The median is the percentage of time spent by the “typical” CDO, while half of all CDOs are contained between the first and third quartiles.

![Figure 3. Percentage of time CDOs spend on various activities](image-url)
As with the rest of the questions in this survey, the number of responses was small; nevertheless, the consistency in these responses is remarkable. As previously mentioned, CDOs do almost everything we asked about, and while they do not spend a lot of time on any single activity, they spend some time on all of them. There is a clear distinction, however, between those activities that CDOs spend the most time on and those on which they spend the least. The two items at the top of the list (data, research, or analytics leadership, and coordinating analytics, data mining, and business intelligence initiatives/projects) are both about the CDO providing leadership to the campus community. The fact that CDOs spend so much time on coordinating initiatives and projects is also perhaps evidence of a strong project management component to the position, when it is in the C-suite. Two activities near the bottom of the list (managing and establishing data quality standards, and managing and enforcing data governance policies and procedures) are both about the CDO managing the operational side of institutional data—tasks that are preliminary to any work with data but are often performed behind the scenes.
CDO Experience Profile

Demographically speaking, CIOs are a somewhat homogeneous lot. CDOs are predominantly (88%) white, with only 12% representation by other ethnicities. CDOs are also predominantly (74%) male. Again, with such a small number of respondents to the current study, one must be cautious about over-interpreting findings. Nevertheless, this finding about the gender balance of CDOs in higher education is consistent with Gartner’s finding that more than 25% of CDOs in large global enterprises are women,13 thus making CDOs among the most gender-balanced of C-suite leadership positions, across sectors. The median age of our respondents is 42, which is almost a full decade less than the median age of any of the other IT leaders surveyed by ECAR, placing control of institutional data in higher education squarely in the hands of members of Generation X (64%).14 Perhaps because CDOs are, by and large, younger than other campus IT leaders, they have had less time to earn graduate degrees: A master’s is the highest degree earned by 48% of CDOs; 33% have a doctorate.

CDO Career Trajectory15

The IT workforce landscape study found that many institutions like to “grow their own” leadership by grooming employees over their career at the institution to fill progressively higher positions.16 CDOs are a prime example of this, as they predominantly come from within. Of the nine CDOs who responded to our workforce landscape report, seven came from a previous position at their current institution and six held a position at their current institution two positions ago.

Given that such a large percentage of CDOs are hired from within, what positions should institutions look to for potential future CDOs? Several CDOs’ previous positions were data, analytics, and business intelligence positions of some variety. Other positions held previously by CDOs include director of research computing and director of enterprise operations.

The IT workforce landscape study found that IT managers have been at their current institutions for a median of 12 years17; the current study, however, finds that CDOs have been at their current institutions for a median of 8 years and in higher education for a median of 13 years. This is clearly not the entirety of these individuals’ tenure in the workforce, given that older members of Generation X have been in the workforce for approximately 30 years. Some percentage of CDOs must therefore, at some point in the past, have come to higher education from other sectors. Lending credence to this is the finding from the current study that CDOs have been in their current position for a median of only 2 years.18 A small handful of CDOs have been
in their current position for a decade or more, though perhaps unsurprisingly half of these individuals are employed at research universities, which may have had the resources to adopt data and analytics practices earlier than other types of institutions. Figure 4 presents the median and the middle half of the number of years CDOs have worked in various positions.

Figure 4. CDOs’ years of experience

Skills

A large number of professional certifications exist in the area of data and analytics, but few of our respondents held any of them. The only analytics-specific professional certification that any respondents hold is the Tableau Certification, though to be fair, some respondents hold graduate degrees in relevant areas, including psychometrics and institutional research. Even more remarkably, very few respondents intend to earn another degree or certification within the next five years: Only five respondents indicated that they intend to do so, while more than half indicated that they do not. Respondents who do intend to earn another degree intend to earn a master’s in data science, while the only professional certification mentioned was the Certified Data Management Professional. Given that the landscape of work related to data and analytics changes so rapidly, one wonders if certifications are not outdated almost as quickly as they are earned. It may be that traditional credentials (i.e., degrees), which tend to provide a broad grounding in a field, are perceived as more valuable than sector-generated certifications, which tend to be more narrowly focused on specific technologies and processes. To be successful, a CDO must be constantly learning about everything in the data space.

Even though CDOs are not engaging in the types of training and certification we asked about in this survey, they nevertheless have broad sets of skills. Respondents were asked to rate their level of expertise on a list of skills relevant to data oversight and management—in fact, the same list discussed above of CDOs’ areas of responsibility. The skills in which the greatest number
of respondents believe that they are expert coalesce into a few categories: institutional data analysis (analytics, institutional research), tools that enable this analysis (decision support system, data warehousing), and the use and presentation of these analyses (business intelligence, data storytelling, and data visualization). Figure 5 represents some of the same data as figure 2: specifically, the number of CDOs who have current responsibility for certain areas of data oversight or management. But figure 5 presents a different perspective on that data: Among the CDOs who have responsibility for an area, what fraction rate themselves as expert in that area?

There are, of course, always skills that one needs to improve. The skill in which the largest number of respondents rated themselves as having no experience is data or analytics vendor relations. This makes a certain amount of sense, as the scope of CDOs’ responsibilities is predominantly internal to the institution; other positions in the campus IT unit may be more likely to be managing
vendor relations. In the case of two other skills—data storytelling and data warehousing—although substantial proportions of respondents said they have no experience in these areas, a large proportion of other CDOs said they are expert in these skills. Clearly, although CDOs have a great deal of experience in many areas, there are nevertheless significant opportunities for professional development.

After rating their level of expertise in skills relevant to their areas of responsibility, respondents were asked two similar questions about their level of expertise in several broad strategic and analytics technologies. The aggregated responses to these questions are shown in figure 6. While these were separate questions on the survey, the response options that the survey offered are not easily separated: What is a strategic technology and what is an analytics technology may be little more than a matter of opinion. Use of big data in learning analytics, for example, may be a strategic priority for an institution, even if it is also a use case for a specific analytics technology. Consequently, the responses to these two questions are combined here.

Although CDOs have a great deal of experience in many areas, there are nevertheless significant opportunities for professional development.

![Figure 6. Number of CDOs reporting expertise in various technologies](image-url)

Perhaps unsurprisingly, the technology in which most CDOs rated themselves proficient to expert was related to analytics: administrative or business performance analytics. This was followed by two items concerning learning analytics and two items concerning institutional analytics. At the very bottom...
of this list was uses of the Internet of Things. This too is perhaps unsurprising: While the Internet of Things is already a presence on campus, it is still in the early stages of implementation and development.21

**Professional Characteristics**

EDUCAUSE and Jisc recently collaborated on two reports that address common concerns: understanding the skills required by technology leaders in higher education, and helping midcareer IT professionals prepare to become the next generation of IT leaders. Those two reports present the findings from discussions among working groups of IT leaders.22 A number of issues appeared time and again during the course of those discussions; these issues were articulated in the reports as key roles played by IT leaders and the essential skills required to perform these roles. These reports “use the word ‘skills’ to encompass skills, general knowledge, and competencies” but acknowledge that “some of the IT leader roles are dependent on the context.”23 In other words, these “skills” are really broad skill categories, which are applicable across a range of IT leadership contexts. These skill categories, essential for success in the key roles played by IT leaders, became the starting point for questions across all of the ECAR IT workforce studies and are the frame used in the analyses presented here.

The findings in the previous section say as much about CDOs’ institutions (and perhaps the institutions that CDOs worked at previously) as about the individual CDOs themselves: It is only possible to gain experience in a particular area related to data and analytics if it is a technology or service that is deployed at one’s institution.

CDOs were also asked to indicate their level of agreement with a set of statements about skill categories for success in higher education IT leadership,24 as shown in figure 7. These statements fall into a set of categories that, as discussed above, are derived from the necessary skills for IT leaders in higher education, identified in the EDUCAUSE and Jisc reports.25 It’s interesting to note that technical skills are at the very bottom of this list, given the common perception mentioned above (misperception, according to the respondent who raised it) that data and analysis is strictly an IT function. This downplaying by CDOs themselves of the importance of technical skills is in line with what many have written about the role—that CDOs must possess technical skills but cannot be too technical or else they run the risk of “a microscopic focus” rather than a focus on data in support of institutional strategy.26 By the same token, a focus on data in support of institutional strategy requires that CDOs possess the ability to collaborate widely across the institution and to provide leadership in matters related to data and analytics. Appropriately, these are the skills that CDOs consider to be most important.
CDOs must possess technical skills but cannot be too technical or else they run the risk of “a microscopic focus” rather than a focus on data in support of institutional strategy.

Figure 7. Importance of various skills for success
Making Future Chief Data Officers

In November 2016, EDUCAUSE launched the new Data Governance and Chief Data Officers Constituent Group. Given the rapid growth in subscribership to this group and participation in sessions hosted by this group at EDUCAUSE events, it is clear that the community is growing. Outside higher education, recall Gartner’s projection that 25% of large global enterprises will have appointed CDOs by 2015 and NewVantage’s finding in 2016 that 54% of Fortune 1000 firms employed a CDO. As with all innovations, the rate of adoption of the CDO position is highly variable across adopter categories, but it seems that across sectors no more than approximately half of organizations currently employ a CDO.

Clearly there is room for the expansion in higher education of work related to data and analytics. Given the wide gap between the strategic importance of data and analytics work and the current level of adoption of the CDO position, developing new CDOs should be a collective priority across all of higher education. Along with the background and skills possessed by CDOs, of interest too is what these individuals believe is best and most important about the job. Aspiring CDOs, take note.

Respondents were asked what they enjoy most about being a CDO, and their answers focused on a few important themes. First, by far the most common theme was that of informing decision making at the institution. “Providing data needed by the university,” as one respondent wrote, is not an end in itself, however; what is enjoyable about being a CDO is using data to “influence positive change” at the institution. That positive change may take many forms, but one that was mentioned by respondents so often that it constitutes a second theme is student success. Our respondents see data as instrumental in “building a productive campus environment” and “helping academics and administration” conduct “discussions that lead to improving practice and student outcomes.”

This building process and these discussions require collaboration across campus, which is the third theme in the responses to this question. Respondents wrote that “working across division lines with all information stakeholders” and “learning from a number of different people on campus” are some of the most enjoyable aspects of being a CDO. This broad collaboration is, ultimately, what enables CDOs to inform decision making at the institution, by “designing and implementing solutions that transform data/information into insights at all levels of the institution.”

Collaboration, of course, requires leadership, and leadership requires many skills that our respondents believe they need to work on. Respondents were asked to identify one thing about themselves that they would change to make themselves more effective data and analytics leaders. The responses to this question were
diverse, but many focused on aspects of institutional leadership. Negotiation skills and networking skills, as well as presentation skills, were identified by several respondents. Several others emphasized the tension between the technical and the leadership skills necessary for success in the CDO role. Many CDOs have a technical background but are new to a leadership role. One respondent summed up this theme by writing that developing these leadership skills requires having more time “to spend establishing and fostering strategic partnerships with key business/functional leaders throughout the institution.” In addition to more time on task, several respondents raised the need for more professional development—both to keep up with changing technology and to develop the soft skills of leadership.

In that vein, respondents were asked what advice they have for those aspiring to become data and analytics leaders. The most common responses to this question hark back to some of the same themes that have already been discussed in this section: informing decision making at the institution, and the tension between technical and leadership skills. Judging by the number of respondents who raised this issue, the most important advice for aspiring CDOs is “to thoroughly understand your institution’s mission, goals, and objectives.” Only when understanding these clearly can one identify the role of data and analytics in realizing these goals and objectives. Several respondents mentioned the importance of attention to how data and analytics will be used by institutional stakeholders: Merely providing data is not sufficient; it is necessary to provide visualizations or other methods for data to tell a “story” of importance to those stakeholders. Thus the technical aspect of the CDO’s role must be strictly in the service of the business side of the institution. Data and analytics are not ends in themselves; as one respondent bluntly wrote, “It’s never just about the data.”
Conclusion

The scope of the CDO’s work is broad and encompasses both providing leadership to the campus community for use and interpreting data, as well as managing the unglamorous tasks of data collection and governance. Data are critical for supporting strategic decision making by campus leadership but are so ubiquitous within and across campus units that it is difficult to know just where in the institutional hierarchy the CDO properly belongs. This accounts for both the diversity in the positions to which CDOs report and the frequency with which CDOs have dotted-line reporting relationships.

The role of CDO is quite new in higher education. This is equally true in other sectors as well, though as discussed above, the rate of adoption seems to be faster outside higher education. Given the dearth of empirical studies of CDOs in higher education, it is therefore to these other sectors that we should look for indications of what the future of the CDO role might be in higher education.

A 2015 report presents a model of the maturity of the CDO’s role in the financial services sector, though it is sufficiently generic that it can apply across sectors. According to this model, once an organization is past the very earliest stages of launching a data strategy, two types of CDO roles emerge: process oriented and value oriented. CDOs whose role is process oriented “focus on data management from a compliance perspective” and generally concentrate their efforts on construction of systems, both technical and procedural, to manage data. In short, the process-oriented CDO role focuses on management of data, discussed as one of the themes that emerged in CDOs’ areas of current responsibility. CDOs whose role is value oriented, on the other hand, “focus on innovation and value creation through data” and generally concentrate their efforts on collection and use of analytics and business intelligence. In short, the value-oriented CDO role focuses on supporting business decision making, discussed as another of the themes that emerged in CDOs’ areas of current responsibility. That report emphasizes that neither type of CDO role is better or worse than the other; rather, the role is shaped by both the requirements of the organization and the individual’s background. Furthermore, both process-oriented and value-oriented roles are paths along which an individual CDO can travel toward creating a big data–ready organization. CDOs whose role is big data ready are “responsible for driving the overall data strategy for their organizations—comprising data compliance as well as value creation from Big Data.”
And it is this responsibility for the institution’s data strategy that is central to understanding the CDO role. Within higher education, as in other sectors, it is critical for an institution to have a data strategy as well as the tools to collect, organize, and visualize the appropriate data for institutional decision making. The CDO’s role is to manage all of these tasks and to engage in data storytelling on issues of importance to those stakeholders. Doing this, of course, exposes politically sensitive issues, which in part has led to CDOs’ having a complicated set of reporting relationships. This variety in reporting relationships may, however, be seen as evidence of the ongoing evolution of the CDO role, a set of natural experiments that are actively working out the best methods for CDOs to exert influence across the institution. And CDOs must exert influence across the institution because of the strategic importance of data and analytics throughout the institution and at all levels of institutional hierarchy. Software continues to eat the world, and this includes the operational side of higher education. In such a world, the CDO is arguably the most strategically important leadership position in any institution.
Advice for Current CDOs

- Consider the appropriate scope of responsibility for your position, particularly with regard to areas that are under campus units outside yours. This scope should depend on the degree to which your position is expected to support strategic decision making by campus leadership and on the political environment at the institution.

- Consider the appropriate percentage of time that you should allocate to the activities within your scope of responsibility.

- Develop a vision for the future of your role.
  - Do you have responsibility for any of the areas that CDOs thought should have been part of their job but weren’t? If not, should you?
  - Is your line of reporting optimal? How might it be improved to benefit the institution via formal and dotted-line reporting relationships?
  - Do you have sufficient resources, including staff, to conduct data and analytics work at your institution? What critical value might you be able to add with more staff?

- Exert influence across the institution via informal relationships to build data and analytics capacity on campus according to these determinations and your institution’s strategic planning process. CDOs who can effectively exert influence across the institution may find this as critical or even more critical than their formal reporting line.

- Identify areas of data and analytics work in which you believe that your knowledge is not as strong as in other areas. Seek out professional development opportunities to strengthen your skills in these areas.

- Seek out data and analytics training and certification options, as well as opportunities to volunteer with data and analytics organizations, to strengthen your skills.

- Because CDOs are often hired from within the institution, work to gain experience in a range of positions related to data and enterprise IT at your institution, as well as in the soft skills of networking and vendor relations.

- Build external professional networks through associations like EDUCAUSE and peer-based organizations, both within and outside higher education.
Advice for the CDO's Supervisor

- Determine the appropriate job title for the CDO. Although a job title is to a certain extent arbitrary, it more or less reflects and is a signal to the profession about the position’s scope of work and the nature of its responsibilities.

- Determine the appropriate reporting line for the CDO. This naturally depends on the role that the CDO plays in supporting strategic decision making by campus leadership and on the political environment at the institution.

- Determine the appropriate scope of the data and analytics unit at the institution. This should depend on the CDO’s current—and ideal—scope of responsibility at the institution.

- Discuss with the CDO areas in which they feel the need for professional development. Provide time and resources for the CDO to pursue appropriate professional development opportunities.

- When seeking to hire a CDO, look for candidates both within and outside your institution. Look for existing CDOs as well as individuals in positions related to data and enterprise IT. Candidates should be able to provide a bridge between the IT unit and other functional areas of the institution.
Advice for Aspiring CDOs

- Gain experience with analytics, business intelligence, and other uses and presentations of data to support business decision making.

- Develop the ability to exert influence across institutional silos and outside formal reporting relationships.

- Gain experience in as broad a range of areas of data and analytics as possible. Seek out appropriate professional development opportunities in technical areas and focus on communication skills, networking, and building relationships.

- Develop a network of CDO colleagues—for example, through the EDUCAUSE Data Governance and Chief Data Officers Constituent Group.

- Develop an understanding of your institution’s strategic plan and priorities. Learn how to engage in data storytelling on issues of importance to institutional stakeholders.

- Remember that “It’s never just about the data.” Aspiring CDOs must be able not only to communicate to campus stakeholders how to use data to support business decision making, but also to understand how data may influence this decision making.
Methodology

Survey invitations were sent to a pool of 1,089 individuals with profiles in the EDUCAUSE member database indicating that they are in a CDO or equivalent position, as well as to others involved in data and analytics work who were identified by respondents to other ECAR studies of IT leadership in higher education. A total of 29 senior data officers completed the survey, representing 29 institutions of higher education. Respondents were from 18 states spanning most regions of the United States, with one respondent from a Canadian institution. Data collection took place in May 2016.

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Notes


4. This view of the CDO position as a broad functional role rather than a specific job title is in keeping with the way the role is being discussed by some in the business trade press. See, for example, Chet Kapoor, “The CDO: It’s a Role, Not a Title,” The Enterprisers Project, May 30, 2014.

5. Among respondents, 41% report to the highest-ranking technology officer (CIO or equivalent position). In a remarkable degree of consistency, PricewaterhouseCoopers reports that 42% of CDOs in financial institutions report to the CIO, with another 42% reporting to the COO, a position that is less common in higher education. See PricewaterhouseCoopers LLP, “Great Expectations: The Evolution of the Chief Data Officer,” 2015.

6. This is consistent with Bean’s observation that CDOs report to the senior executive within a range of key functional areas. See Randy Bean, “Big Data and the Emergence of the Chief Data Officer,” Forbes, August 8, 2016.

7. Adding yet more complexity to the issue of the CDO’s reporting relationship is the apparently emerging trend in the corporate sector of the CDO job title being merged with positions above the CIO level, such as CEO and vice president. See, for example, Martha Heller, “Why a Move to Chief Digital Officer Was a Promotion for One CIO,” CIO, April 12, 2017; and Steven Norton, “Schindler Digital Chief Michael Nilles Explains Why He Left the CIO Title Behind,” Wall Street Journal, November 3, 2016.

8. For our analyses we divided institutions into categories based on enrollment size (full-time equivalent). These categories were derived from Integrated Postsecondary Education Data System (IPEDS) data for fall 2014. The categories are as follows: very small (less than 2,000), small (2,000–3,999), medium (4,000–7,999), large (8,000–14,999), and very large (15,000+). Please note that the Carnegie Classification of Institutions of Higher Education uses these same names for their categories of institutional enrollment size in the size and setting classification variable. However, our operationalization of size categories differs from Carnegie’s. For Carnegie, a very small two-year institution has fewer than 500 students, while a very small four-year has fewer than 1,000, for example. Our categories, however, are consistent across all institution types: small is small whether it’s a bachelor’s or a doctoral institution.


11. PricewaterhouseCoopers LLP, “Great Expectations.”

12. The percentage of time spent on various activities sums to 100% for each individual respondent. The medians presented here, however, are across all respondents and therefore do not sum to 100%.


15. The findings in this section are results of a re-analysis of data from the IT workforce landscape survey. See Jeffrey Pomerantz and D. Christopher Brooks, The Higher Education IT Workforce Landscape, 2016 (Louisville, CO: ECAR, April 2016). For a more in-depth view of career trajectories within the higher education workforce, see Career Paths: Higher Education IT Sectors.


17. Ibid.

18. Using data from the IT workforce landscape survey, we looked at the job history of senior data and analytics leaders, those in the positions of senior-most data/analytics officer, and director/lead of analytics. These individuals’ previous two jobs were overwhelmingly within higher education (eight of nine for their previous job, and seven of those eight for two positions ago), and indeed two of these data leaders have never held a previous IT position outside higher education. However, five of the nine previously held IT positions in private industry; two previously held IT positions with nonprofit organizations; one was previously employed in a K–12 education IT position.

19. Responses to this question were on a Likert scale ranging from “No experience; none needed” to “Expert-level experience; no more needed.”

20. Responses to these questions were on a Likert scale ranging from “No expertise” to “Expert.”


22. EDUCAUSE and JISC, Technology in Higher Education: Defining the Strategic Leader (Louisville, CO: EDUCAUSE in partnership with JISC, March 2015); and EDUCAUSE and JISC, Technology in Higher Education: Guiding Aspiring Leaders (Louisville, CO: EDUCAUSE in partnership with JISC, February 2016).

23. EDUCAUSE and JISC, Technology in Higher Education: Defining the Strategic Leader, 29.

24. Responses to this question were on a Likert scale ranging from “Not at all important” to “Extremely important.”

25. EDUCAUSE and JISC, Technology in Higher Education: Defining the Strategic Leader.


27. See Data Governance and Chief Data Officers Constituent Group.


29. Kelly, “The Chief Data Officer.”

30. Coumaros et al., “Stewarding Data.”
