LEADERSHIP IN HIGHER EDUCATION TECHNOLOGY

A combined report examining chief information officers and technology leaders in higher education

2018

Wayne A. Brown, PhD
CENTER FOR HIGHER EDUCATION CIO STUDIES
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ACKNOWLEDGEMENTS

During the past 15 years, I have had the pleasure of documenting the progress, or in some cases the lack of progress, of the higher education chief information officer (CIO). These observations have been gathered from higher education CIOs, their colleagues on the institution management team (IMT), and those in the next organizational layer down from the CIO. This data has documented the higher education CIO career, its path to the role, and its attributes. This study is not only thorough, but also distinctive in that as the only higher education CIO practitioner doing this work, I have a profound depth of understanding for the data. I haven’t only studied the CIO role, I have experienced it.

Ten years ago, I augmented CHECS CIO studies by incorporating the higher education technology leader (TLs) to my list of positions to observe and document. The people in the TL position are in the next layer down from the CIO. These are the people most likely to replace the CIOs, half of whom have consistently predicted retirement within a decade.

In 2014, I added the chief information security officer (CISO) position to the list and have enjoyed discovering the similarities between the CIO and CISO research. This year, I am including the chief academic technology officer in my research agenda. I look forward to learning more about that position and sharing the information with the community.

In early 2018, I was speaking to a reporter about this work, and I mentioned that for some of the results, my research was a little like watching grass grow. The results, for some of the survey questions, has remained surprisingly (and in some cases, disappointingly) steady. I went on to tell the reporter that while it is like watching grass grow, if it isn’t done, the weeds of anecdotes begin to crop up. We can’t have that. Anecdotes are easy; they can be fun. They can be thrown out to the world with no proof other than a couple of examples. But, it doesn’t make them reality, and as Ron Danielson, longtime CIO of Santa Clara University, once told me, “Two anecdotes don’t make data.”

The CIO profession has been weighed down by some of the anecdotes from the past 20 years. For instance, one publication or another will exclaim that the “CIO has arrived!” The anecdote goes further, predicting that CIOs will take the board room by storm, running the entire organization and reporting to the CEO in numbers never seen before. I recall seeing the “CIO arrival” headline in the early 2000s. I still read it today, but the longitudinal results of this ongoing work do not support these claims.
In fact, the scales of CIO importance to an organization may be tipping in the other direction. The percentage of CIOs who report to the CEO has remained in the mid to low 30 percent range in every year I've done this work. In 2017, the most frequent title for the CIO’s supervisor was not the CEO; it was the chief financial officer (CFO). In 2018, CFO and CEO were the most frequently named supervisor. Some CIOs may complain and blame the CEO for a lack of understanding about technology. However, I believe there are a few factors contributing to this issue. One possible reason may be the wrong people are placed in the CIO position. They cannot or do not communicate well, or they cannot effectively lead – the two most important skills for the CIO position, according to this longitudinal research. Poor communication and/or leadership skills would require that the CIO is supervised more closely than he or she would be under a CEO. Another reason may be that the organization is not ready for effective technology leadership. The CEO or cabinet might not be open to the possibilities technology can introduce to an organization. They may view it as little more than a utility to be managed, much like electricity and wiring.

I spend a significant amount of time tracking where CIOs go when they change jobs. I began noticing that when some CIOs move on from a position, their former position gets buried deeper in the organization. In some cases, I can no longer find a mention of a CIO on the institution website. This change is curious, and I question why the organization, and more importantly, the CIO’s role is diminished. I know this example is anecdotal but coupled with the fact that a significant percentage of CIOs report to someone other than the CEO, it may be an example of organizations who do not value the CIO position.

In the 15 years since I've started this work, the percentage of CIOs who serve on the management team has remained relatively unchanged. The result stays in the mid to high 50 percent range. Consider for a moment all the changes in technology since 2003 and how important technology has become to how we, as an industry, do business. Consider how students have changed as well as their expectations for the technology, and yet our profession hasn’t moved or progressed forward in some very important respects. The percentage of CIOs who report to the CEO has remained in the low 30 percent range and the percentage of CIOs who serve on the cabinet has remained stagnant.

In the early 2000s when I began this study, the CIO was often the person who was willing to take on the role. There was no clear career path or major associated with the position. CIOs with a liberal arts background were as common as those with business majors. In those formative years, CIOs came from a variety of career paths and converged in the developing IT department. Given their varied, often time unrelated
education and background as well as a rapidly evolving department, it may not be surprising that CIOs were supervised by someone other than the CEO. A decade and a half later, our profession has matured with a career path and major, but it has not advanced within the organization. There is little change regarding CIOs’ place in the institution and it often remains under the same supervision found in the early 2000s. It leads one to question why hasn’t the CIO role matured into an executive leader? Are we missing something? It may be time for us to have an introspective examination regarding not only who the CIO is but if that role is contributing to the organization in the ways institution management expects of it.

Thank you to the 2018 survey participants in CHECS’ research: CIOs, TLs, and Chief Information Security Officers (CISO). Their ongoing participation and interest demonstrate this work is critical. The CIO survey is in its 15th year, the TL in its 10th year and the CISO survey is in its fifth year.

In 2018, I want to explore the senior academic technology position. Where do they come from? What are they responsible for? Who do they report to and to whom do they think they should report? This report and the forthcoming chief academic technology officer report will include the 2018 CIOs views about these questions. For organization purposes, this year I have combined the CIO and TL reports into one concentrated report that will continue to be released in the middle of the calendar year.

I know how busy technology executives and other leaders are, and I appreciate everyone taking the time to participate in the research. I could not continue this work or the other CHECS initiatives without the CHECS sponsors and subscribers and their generous support. The sponsors and subscribers are committed to this research and to the higher education technology professions. If you see one of the CHECS sponsors or subscribers, please be sure to thank them for their help with this work.

I also want to thank the CHECS’ advisory board. I have continued to challenge them with new responsibilities and volunteer opportunities and they are always there for the organization. The work required to operate a private nonprofit organization is another layer of work on top of the research, writing and presentations. The advisory board has helped shoulder some of the operations work and I am forever grateful to them. The all-volunteer board has devoted countless hours to expand and realize CHECS’ mission: Contributing to the education and development of the CIO in higher education. Our esteemed board of CIOs, CATOs, TLs, Presidents, and sponsor representatives have
selflessly shared their thoughts and experiences to benefit the higher education technology leadership field.

We have begun working on initiatives in our strategic plan and you will see the results of that work. We will celebrate the 10th anniversary of CHECS in 2019 – look for more information on that soon. We will continue to offer webinars and opinion pieces on CHECS research.

“To that end, we have endowed perpetual academic scholarships at four institutions, benefiting technology students at different levels of education. Through CHECS, to date, almost $100,000 has been donated to these scholarships.”

As you may know, CHECS is a nonprofit organization. Funds raised through report sales, subscriptions, and resume services help CHECS in support of its mission. To that end, we have endowed perpetual academic scholarships at four institutions, benefiting technology students at different levels of education. To date through CHECS, almost $100,000 has been donated to these scholarships. The scholarships were created to help students seeking a technology-related degree as well as recognize influential technology or education leaders who have left a lasting mark on CHECS’ studies. Through these scholarships, CHECS is paying it forward and helping future technology leaders who may become a higher education CIO someday. The scholarships are:

- **The Dr. Trudy Abramson Scholarship**, Nova Southeastern University, Fort Lauderdale, Florida—$1,000 annual scholarship to a doctoral candidate
- **The Dr. Polley Ann McClure Scholarship**, University of Texas, Austin—$1,000 annual scholarship benefiting an undergraduate woman and/or minority
- **The Dr. Detlev H. Smaltz Scholarship**, Florida State University, Tallahassee, Florida—$1,000 annual scholarship to a graduate student
- **The Stephen Pribyl Scholarship Fund**, Excelsior College, Albany, New York—need-based annual scholarship for women and/or minorities

We also want to thank Dr. Herb Smaltz; our CIO and IMT surveys are based on his 1999 doctoral healthcare research. We are ever grateful to Dr. Smaltz. The research, the scholarships, the webinars—these are all efforts in line with CHECS’ mission. Our mission could not be achieved without your continued support. Thank you again.

Best regards,

Wayne A. Brown, Ph.D.
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INTRODUCTION

Over the past 15 years the CHECS research has brought to light a number of interesting revelations about the higher education CIO and the higher education technology leader (TL). These revelations have been rooted in the data that has been collected from thousands of survey respondents. The TL is defined as the person in the organizational layer down from the CIO. This person is the one who may aspire to become the technology department leader and will likely succeed the CIO.

CHECS has created a comprehensive picture of the higher education CIO and TL through its research of the two groups and the institution management team (IMT) members (Brown, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017). The IMT are the institutions’ vice presidents and presidents. The longitudinal nature of the CHECS’ studies and their longevity has given higher education CIOs and their constituents an anecdote-free portrait of the CIO. Furthermore, CHECS studies have documented the evolution of the higher education CIO and TL. We know where higher education CIOs come from professionally, what their plans are and where they hope to go professionally. We also know what the CIO career path looks like and the recommended steps to become a CIO. We understand the shortcomings of the profession where diversity is concerned, and we know what makes a CIO effective. In addition, CHECS is providing insight into who the TLs are, what they are doing, and if they are pursuing a CIO position.

This year’s research began in January 2018 with an invitation to participate sent to more than 1,900 higher education technology leaders and 2,800 CIOs in the United States. More than 300 people responded to the invitation. In addition, this report used information from the 2017 CHECS IMT survey. The CIO and IMT surveys are based on Dr. Herb Smaltz’ 1999 doctoral healthcare CIO research.

The CHECS CIO, IMT and TL research is unique in many ways. It is the longest-running research project on the higher education technology executive positions. In addition, it is the only work that compares three different but relevant views of the positions. Finally, it is the only work conducted by an experienced higher education CIO.
I began this work 15 years ago. For those that don't remember (or may want to forget), we were still trying to recover from the dotcom implosion, an interactive web was introduced the following year, iPhones and Kindles were four years in the future, a useful mobile web was six years in the future and the Apple watch would not be invented for another 12 years. Higher education has kept up with many of these improvements thanks to IT departments and CIOs but...

In the 15 years since I began following higher education CIOs, the percentage who report to the CEO and serve on the management team has fluctuated slightly but not really moved, the most important and effective CIO roles are still very foundational (classic IT support and vendor management), our diversity has not improved and our reach in the organization is still largely confined to IT. The table below shows key CIO research results in 2003 and technology events that have occurred since then and the result for the same CIO research in 2018.

<table>
<thead>
<tr>
<th>TECHNOLOGY EVENTS</th>
<th>CIO RESEARCH RESULTS</th>
<th>2003</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blu-Ray Introduced in 2003</td>
<td>CEO reporting has an impact on effectiveness (IMT)?</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Interactive web 2004</td>
<td>Percentage reporting to CEO</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>iPhone introduced 2007</td>
<td>Percentage who were members of the IMT</td>
<td>59</td>
<td>61</td>
</tr>
<tr>
<td>Wave of higher education ERP implementations Early 2000s</td>
<td>Percentage of respondents reporting within one level of CEO</td>
<td>96</td>
<td>97</td>
</tr>
<tr>
<td>Useful mobile web 2009</td>
<td>Percentage with advanced degree</td>
<td>82</td>
<td>81</td>
</tr>
<tr>
<td>LMS adoptions Early 2000s</td>
<td>Minority Percentage (2010)</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

There are always outliers but for the thousands who have completed the surveys over the years, this is the reality. Maybe this state is okay?

Having been a CIO and an avid observer of the profession, I don't feel like these results are "good enough" and when I think about reasons I always come back to preparation for the job. The recommended preparation for the CIO role (according to CIOs) is on-the-job training, being mentored by a CIO, and service on institution-wide committees. If you take out committee service, this is the same way that shoe cobblers and butchers
get ready to take on the *big role* in those industries. As a result, I suspect some percentage of CIOs are not ready for the job and bring these study results on themselves and leave them for their successors. Unfortunately, the results are also witnessed by management team members who hire CIOs and decide where we fit in the organization.

I've had the good fortune to work with Sharon Blanton and others on professional development for new higher education CIOs and I've looked at/attended other programs such as the IT Leadership Program that Ron Danielson put together at Santa Clara University. My experience has been that some CIOs may think that getting the first CIO job is the hardest part and once they get the job, they no longer need a new CIO class or to learn how to be a successful CIO. Perhaps, getting the job was the easy part; keeping the job and moving the needle forward on some of the more important CIO statistics is the hardest part.
In preparation for the CHECS chief academic technology officer (CATO) report that will be released in the autumn of 2018, the CIOs were asked several questions about the CATO and Academic Technology in their institution.

The first, and perhaps most obvious question was do you have a group devoted to academic technology? This might seem like an unnecessary question because IT departments are supporting the mission of the institution – academics. However, not all institutions have such a group; 25 percent of the respondents indicated they did not have a group in IT devoted to academic technology (chart below).

**CHART 1. ACADEMIC TECHNOLOGY GROUP**

![Pie chart showing 75% Yes and 25% No](image)

Figure 1 Of the respondents, a quarter of them did not have an Academic Technology group.

The CIO who had a group devoted to academic technology provided the title of the senior academic technology leader. The most common title at 52 percent was director (chart below), another six percent had the more specific director title of academic technology director while four percent were assistant or associate CIO.
The CIOs who indicated they had a group devoted to academic technology were asked for the areas included in that group’s portfolio. The most common answer was the *learning management system* followed by *classrooms* (chart below). The third and fourth most commons responses were *instructional design* and *other academic software*.
Finally, the CIOs were asked whom the senior academic technology leader reported to (actual) and ideally to whom they should report (ideal). The most common answer, by almost 50 percent, for both actual and ideal reporting was the CIO. Sixty-two percent of the CIOs indicated reporting to them was the actual configuration and 73 percent of the CIOs thought that was the ideal reporting relationship (chart below). The next closest result was 16 percent for the provost for actual and ideal.
CHART 4. SENIOR ACADEMIC TECHNOLOGY LEADER ACTUAL AND IDEAL REPORTING
TECHNOLOGY LEADERS OF TOMORROW

CHECS began researching the TL in 2009. The work was begun because of a large and imminent retirement problem for CIOS. The CIO retirement projection was one of the consistent results from CHECS’ CIO research. In 2017, the percentage of CIO predicting retirement in the next 10 years was at a high of 53 percent (Brown, 2017). In 2018, CIO retirement in the next decade reached another new high at 57 percent. This retirement finding created questions about who would fill the CIO role in the future.

Prior to the TL research by CHECS, we did not know much about the TL and had many questions about them. These questions included: were the TLs interested in becoming a CIO, and if so, what were they—the next generation of CIOs—doing to prepare? What was the makeup of the group? Would their rise to the CIO position have an impact on the lack of racial and gender diversity of the CIO profession? Were they being mentored? Did they understand the CIO role? The research collected data about TL backgrounds, preparation for the CIO role, assistance with that preparation, and their plans for the future.

Career Plans

In 2018, 57 percent of the CIO survey respondents indicated they would retire within the next decade. This data has been consistent in the CHECS’ CIO research. A complementary question about the TL is whether they were interested in becoming CIOs in the future. There was almost fifty percent of the TLs who wanted to become a CIO while another 26 percent of TLs were unsure about their plans (chart below).

CHART 5. TL CAREER PLAN

Figure 3 Nearly half of the participating 2018 Technology Leaders expressed an interest in becoming the department leader in the future.
The percentage of TLs interested in pursuing a CIO position reached its lowest level in 2018 (see chart below). The high point occurred in 2009 at 69 percent, the first year the TL research was conducted. Since that year, the percentage has slowly declined.

**CHART 6. TLS WHO WANTED TO BECOME A CIO, 2009 TO 2018**

Another factor that might affect the development of future CIOs is whether the TLs had retirement plans similar to the CIOs. Fortunately, only 32 percent of the TLs who wanted to be CIOs planned on retiring in the next decade (chart below). This result is relatively low compared to the CIO retirement plans. However, it represents the highest percentage for this question in the life of the TL research.

**CHART 7. RETIREMENT PLANS OF TLS INTERESTED IN BECOMING A CIO**
The chart below depicts the aspiring TLs’ retirement plans during the 10 years this data has been collected. For the TLs predicting retirement in the next 10 years, this year, at 32 percent, was the highest in the 10 years of this research. The low was in 2010 at 13 percent.

**CHART 8. ASPIRING TLS RETIRING IN 10 YEARS, 2009 TO 2018**

Regarding career plans, 47 percent of the CIOs wanted to remain in their current positions (chart below) while another 28 percent of the responding CIOs indicated they wanted to be a CIO at another institution. Seven percent of the respondents indicated they were going to pursue a higher education presidency. These were also the three most common responses in 2017.

**CHART 9. CIO CAREER PLANS**

A closer look at the plans of the CIOs revealed that of those CIOs who wanted to remain in their current position, 74 percent planned on retiring in the next 10 years (chart below).
In 2017, the IMTs were also asked about their retirement plans and the result exceeded the CIO result in 2017 and 2018. During the next decade, 63 percent of the IMTs expected to retire. In the next five years alone, nearly half (46 percent) expected to retire (chart below).

**CHART 11. 2017 IMT RETIREMENT PLANS**

CHECS was the first to report on the projected retirement for the higher education CIO and that projection becoming reality can be seen in the results of this research. In 2018, that finding again reached a new high when 57 percent of the respondents indicated they would retire in the next decade (chart below).
CHECS has tracked CIO retirement plans since 2008. The following chart depicts the percentage of CIOs who planned to retire between one to 10 years from the respective survey year. As depicted, the result has risen ten percent since 2014.

**Institution Types**

The population for the TL survey was selected using two different methods. The first method was based on institution student-population size being more than 3,000 and having a visible IT management layer below the CIO. This method resulted in more doctorate and master’s types of institutions being selected. The second method for selecting the TL survey invitees was asking the CIO survey respondents to identify
individuals in their organizations who should be included in the TL research. As a result of the two methods, the TL group did not represent the overall makeup of U.S. institutions. The CIOs were found through the ongoing research, institution website searches, and the author’s LinkedIn profile.

**CHART 14. TL INSTITUTION TYPE DISTRIBUTION**

![Bar chart showing TL institution type distribution with Doctorate at 58%, Master's at 24%, Baccalaureate at 7%, Associate's at 10%, Special Focus at 0%, and Tribal Colleges at 1%]

*Figure 4 In 2018, Technology Leaders (TL) worked at different institution types. The two methods used to find TLs resulted in more doctorate and master’s institution types being selected.*

The CIO respondents in this research were from all major institution types (chart below).

**CHART 15. CIO RESPONDENTS BY INSTITUTION TYPE**

![Pie chart showing CIO respondents by institution type with Doctorate at 25%, Baccalaureate at 20%, Master's at 29%, Associate's at 23%, Tribal Colleges at 0%, and Special Focus at 3%]
Institution Types and Sizes

As with the institution type, the CIOs responding to the 2018 survey came from all institution sizes, from those serving under 3,000 students to those with more than 20,000 students. A quarter of the responding CIOs worked in institutions serving more than 10,000 students. The following chart depicts the percentage of CIO responses by institution size.

CHART 16. CIO INSTITUTIONS BY SIZE

Age

Fifty-two percent of the TL survey respondents were 51 years or older (chart below). In comparison, 69 percent of the 2018 CIOs were 51 years or older.

CHART 17. TL AGE OF RESPONDENTS
In 2009, the percentage of TLs who were 51 years old or older was at its lowest, 32 percent. In the ensuing eight years, the percentage increased by 20 percent (chart below).

**CHART 18. TLS OLDER THAN 51 YEARS OLD, 2009 TO 2018**

![Chart showing the percentage of TLS older than 51 years old from 2009 to 2018. The percentage increased from 32% in 2009 to 52% in 2018.]

**CIO Age**

The age ranges for the higher education CIO are depicted in the chart below. Sixty-nine percent of the CIOs were 51 years or older, while the largest single group, at 26 percent, was 56-60 years old.

**CHART 19. CIO AGE**

![Chart showing the age distribution of CIOs. The largest group is 51-55 years old, comprising 26% of the CIOs. The 66-70 age group is the second largest, at 21%.]
The chart below provides a comparison of CIO age brackets for 2009 and 2018. The percentage of CIOs who were 51 years or older increased by 14 percent since 2009.

**CHART 20. CIO AGE COMPARISON: 2009 TO 2018**

The following chart displays the percentage of CIOs in the 51-years-or-older age brackets since 2010.

**CHART 21. CIOS 51 YEARS AND OLDER, 2009 TO 2018**

It is intuitive that the average senior IT executive would be an older person. It could take 20 years or more to move through the IT department ranks to become its leader. As a comparison, IMT respondents were also asked for their age. The following chart depicts an age comparison between the two executive groups for 2017. There were 66 percent of the CIOs who were 51 years old or older compared to 85 percent of the IMTs were in the same age brackets.
Figure 5 A direct age comparison is shown between Chief Information Officers (CIO) and the Institution Management Team (IMT). CIOs tend to be younger than IMT counterparts until the 61-65 year age bracket.
Budget

Budget is part of any leader’s responsibility. In 2018, 65 percent of the TLs were responsible for budgets exceeding one million dollars (chart below).

**CHART 23. TL BUDGET FOR ALL RESPONDENTS**

There were 45 percent of the responding CIOs with a technology budget between $1 and $5 million. While 13 percent had a budget under $1 million, six percent of respondents managed budgets exceeding $25 million (chart below).

**CHART 24. CIO BUDGET**

Supervision

The TL supervised an average of 39 people in 2018. This was an increase from 32 in 2016 and 2017. This leadership and management experience will be critical for TLs who plan to become a CIO in the future.
Maintaining Knowledge

Most TLs named reading, conference attendance, projects, and discussions as activities they engaged in to maintain their expertise. The methods and results are depicted in the chart below.

**CHART 25. MAINTAINING KNOWLEDGE**

TL professional development activities were also examined. The majority of TLs, 89 percent, attended a higher education technology conference attendance (chart below). While 60 percent of the respondents indicated they attended professional development within their institution and 64 percent attended leadership/management training.

**CHART 26. PROFESSIONAL DEVELOPMENT**
Technical certifications may be important as a person rises through the ranks in an IT department. However, CHECS’ research has revealed that certifications have not been important to senior IT professionals in leadership roles. In 2018, 50 percent of TLs did not have a certification (see chart below). The next single largest response was Information Technology Infrastructure Library (ITIL) certification at 35 percent. The percentage of TLs with an ITIL certification has been increasing in this research.

**CHART 27. CERTIFICATIONS**

<table>
<thead>
<tr>
<th>Certification</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISM</td>
<td>1%</td>
</tr>
<tr>
<td>MOUS</td>
<td>1%</td>
</tr>
<tr>
<td>CCNA</td>
<td>1%</td>
</tr>
<tr>
<td>Six Sigma</td>
<td>3%</td>
</tr>
<tr>
<td>MCSE</td>
<td>3%</td>
</tr>
<tr>
<td>CISSP</td>
<td>4%</td>
</tr>
<tr>
<td>PMI</td>
<td>7%</td>
</tr>
<tr>
<td>Other, please specify</td>
<td>14%</td>
</tr>
<tr>
<td>ITIL</td>
<td>35%</td>
</tr>
<tr>
<td>None</td>
<td>50%</td>
</tr>
</tbody>
</table>

The percentage of TLs without a certification has declined from 72 percent in 2010 to 50 percent in 2018.

**CHART 28. TLS WITHOUT A CERTIFICATION, 2010 TO 2018**
TL Compensation

Salary is an important topic. The average TL salary was $128,741. In comparison, the 2018 CIO salary was $152,088. In 2017, the average CIO salary was $156,608, an increase from the 2016 results. The Chronicle of Higher Education reported CIOs average salary was $134,168 with those at two-year institutions earning on average $112,430 and those at research institutions earning $229,500 (2015c). CIO Magazine reported in their annual survey the average cross-industry CIO salary was $234,830 (2015a).

Tenure

TLs have held their position for an average of six years and six months. This average is a new high for this research and significantly longer than the anecdotes would have readers believe about technology executive tenure. The TLs' average position tenure through the course of this research is depicted in the table below.

TABLE 1. TL TENURE IN CURRENT POSITION

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Years</td>
<td>4 Years, 9 Months</td>
<td>5 Years, 4 Months</td>
<td>6 Years, 1 Month</td>
<td>6 Years, 5 Months</td>
<td>7 Years, 8 Months</td>
<td>5 years, 10 months</td>
<td>6 years, 5 months</td>
<td>6 years, 1 month</td>
<td>6 years, 1 month</td>
<td>6 years, 6 months</td>
</tr>
</tbody>
</table>

The higher education CIO’s tenure in their current position has never been below five years in this research (chart below). In 2018, the average CIO tenure was six years and six months. In cross industry surveys, the average CIO tenure was also six years and six months (2016). Interestingly, the average tenure for higher education presidents was six years and five months in 2016 (2017).
Reasons for CIO Position Pursuit

Among the TLs interested in the CIO role, they shared the reason why they were pursuing the position. The majority, 60 percent, indicated they wanted to *Make a difference* (see chart below). Another 23 percent thought the CIO position was the *Next logical step* in their career.

CHART 30. REASONS FOR CIO POSITION PURSUIT

- Make a difference, 60%
- Next logical step in my career, 23%
- Increase my pay, 3%
- Other, 14%
Skills Needed by the CIO

The three survey respondent groups named five skills they believed were most important for a higher education CIO. The CIOs named Communication the most frequently at 88 percent and Leadership at 78 percent. These two most frequently selected responses from the CIOs have been consistent throughout this research.

The five most frequently named skills named by the CIOs are listed in the following chart.

**CHART 31. CIO PERSPECTIVE: FIVE MOST IMPORTANT SKILLS FOR CIOS**

Among the IMTs in 2017, 83 percent selected Technical knowledge as the most important skill for a CIO. Communication and Leadership were the second and third, respectively (see chart below).
TLs also named essential skills for CIOs. Their responses were similar to CIOs with their first and second most important skills identical to the CIO’s except in reverse order (see next chart).
The following chart and table depicts a side-by-side comparison of five most important skills as named by the three groups. The greatest difference of opinion was for *Technical knowledge*. Less than half of CIOs and TLs believed it was a critical skill while 83 percent of IMTs believed it was necessary.

### CHART 34. REQUIRED CIO SKILLS COMPARISON
CIO Degree Major Opinions

The CIOs, TLs, and IMTs named the degree major they believed the higher education CIO should possess. They could select any number of degree majors from a pre-defined list and enter their own responses.

Prior to 2016, the CIOs’ most frequent response was *Major is not important*. Since 2016, the most frequent response from the CIOs was *Technology* major (see chart below). This response was followed by the *Business* at 37 percent and *Major is not important* at 36 percent.

**CHART 35. CIO PERSPECTIVE: DEGREE MAJOR CIO SHOULD HAVE**

The IMT most frequently selected CIO degree major response has been *Technology*. In fact, since 2010 (when this data was first collected from the IMT group) the percentage who selected *Technology* increased 34 percent. The chart below depicts the IMT percentage from 2010 to 2017 of those who selected *Technology* as the degree major CIOs should possess.
The majority of TLs have also selected the *Technology* major since 2016. In 2018, it was 53 percent of the respondents (see chart below). The second most frequent TL response, 44 percent, was *Major is not important* and *Business*.

**Chart 36. IMT Perspective: Technology Degree Major Needed by CIO, 2010-2017**

Similar to the 2016 and 2017 report, there was alignment between the CIOs, IMTs, and TLs for the preferred CIO degree major. All three groups named *Technology* the most frequently. Historically in CHECS’ studies, *Major is not important* has been the most frequent response for CIOs and TLs. The two most frequent responses for the three groups are depicted below.
TL and CIO Degree Major

The TLs were asked about the degree major they held. *Technology* was the most frequently named major at 25 percent; it was closely followed by *Business* at 24 percent (see chart below).

**CHART 39. TL DEGREE MAJOR**

- Law: 1%
- Leadership or Management: 3%
- Mathematics: 3%
- Communications: 4%
- Engineering: 4%
- Library and Information Science: 4%
- Administration (Higher education, public etc): 6%
- Education: 7%
- Other: 10%
- Humanities: 10%
- Business (Business, MBA etc): 24%
- Technology (IT, IS, Computer Science etc): 25%
The *Technology* major is a natural choice for the TL, but consistently less than 40 percent of the TLs in the CHECS research have held the degree (see next chart). Considering that the majority of IMTs, CIOs, and TLs believed a CIO should possess a *Technology* degree, in the future this percentage may increase.

**CHART 40. TLS WITH A TECHNOLOGY MAJOR, 2009-2018**

The CIOs also provided their degree major. Over the life of this research, the CIOs have always had a wide variety of degree majors. However, the wide variety of degree majors has shrunk during the years of this research. This year the most frequent response was *Technology* with 28 percent followed by *Business* at 26 percent (see chart below). Another 32 percent of the respondents held an *Education, Leadership or Management, Engineering, or Administration* major.
CHECS has gathered data on CIO degree majors since 2007. A comparison of the top four responses for degree majors is shown in the chart below. The most significant difference is that the percentage of CIOs with a Technology major has increased by eight percent while those with Other has decreased by 13 percent. These changes reflect the maturation of the field and may also reflect the IMT stated preference for a Technology major and technical skills for the CIO.
Professional Affiliations

Eighty-five percent of the TLs indicated a professional affiliation with EDUCAUSE. Another 32 percent were affiliated with Gartner (see chart below).

CHART 43. PROFESSIONAL AFFILIATIONS
Degree Level

An advanced degree is required for the higher education CIO position and the majority of CIOs have one. For the second straight year, the percentage of CIOs with an advanced degree was 81 percent (chart below).

**CHART 44. CIO DEGREE**

<table>
<thead>
<tr>
<th>Degree Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctorate</td>
<td>18%</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>63%</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>17%</td>
</tr>
<tr>
<td>Associate's Degree</td>
<td>1%</td>
</tr>
<tr>
<td>High school or equivalent</td>
<td>1%</td>
</tr>
</tbody>
</table>

CHECS has collected data on CIO degrees since 2003 (chart below), and during this entire period, the advanced degree result has been relatively stable.

**CHART 45. CIOS WITH ADVANCED DEGREES**

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>82%</td>
</tr>
<tr>
<td>2005</td>
<td>68%</td>
</tr>
<tr>
<td>2007</td>
<td>75%</td>
</tr>
<tr>
<td>2008</td>
<td>76%</td>
</tr>
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<td>2009</td>
<td>77%</td>
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<tr>
<td>2010</td>
<td>79%</td>
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<td>2011</td>
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<td>2016</td>
<td>82%</td>
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<tr>
<td>2017</td>
<td>81%</td>
</tr>
<tr>
<td>2018</td>
<td>81%</td>
</tr>
</tbody>
</table>
The chart below depicts the institution types and the percentage of CIOs with each degree level who worked in those institutions. In all of the major institution types, at least 66 percent of their CIOs held an advanced degree.

**CHART 46. CIO DEGREE BY INSTITUTION TYPE**
The chart below provides information on which CIO degree holders worked in which institution types. The majority of those with an advanced degree worked in a master’s or doctorate institution.

**CHART 47. CIOS BY DEGREE LEVEL AND INSTITUTION TYPE**

- **Doctorate**: 19% at High school or equivalent, 14% at Associate's Degree, 33% at Bachelor's Degree, 31% at Master's Degree, 2% at Doctorate
- **Master's Degree**: 22% at High school or equivalent, 17% at Associate's Degree, 34% at Bachelor's Degree, 25% at Master's Degree, 3% at Doctorate
- **Bachelor's Degree**: 26% at High school or equivalent, 39% at Associate's Degree, 11% at Bachelor's Degree, 21% at Master's Degree, 0% at Doctorate
- **Associate's Degree**: 67% at High school or equivalent, 0% at Associate's Degree, 33% at Bachelor's Degree, 0% at Master's Degree, 0% at Doctorate
- **High school or equivalent**: 50% at High school or equivalent, 0% at Associate's Degree, 50% at Bachelor's Degree, 0% at Master's Degree, 0% at Doctorate
In 2018, 69 percent of TLs had an advanced degree (chart below). Indeed, the majority of CIOs, IMTs, and TLs indicated a CIO should have an advanced degree. Through the life of CHECS’ studies, more than two-thirds of CIOs had an advanced degree.

**CHART 48. DEGREE LEVEL FOR ENTIRE TL GROUP**

The percentage of TLs with an advanced degree reached a high of 73 percent in 2014 (see chart below). 2018 was the second highest result in the 10 years this research has been conducted.
There were minor differences for the TL degree holders based on gender (see chart below). Three percent more of the female TLs held a master’s degree than the male TLs, while 21 percent of the male TLs held a doctorate compared to 17 percent for female TLs.

In 2018, there were 82 percent of higher education CIOs who believed the person holding the CIO position should have an advanced degree (see chart below).
Seventy-seven percent of the CIOs who held a master’s degree indicated they believed a master’s degree should be required for a CIO (see chart below), while 79 percent of the CIOs with a doctorate stated a doctorate was necessary for the CIO position.

**CHART 52. CIO PERSPECTIVE: DEGREE REQUIRED FOR THE CIO**

Figure 6 This chart depicts CIOs by the degree they hold and which degree they believe should be required for the CIO position.
The chart below depicts the IMT response since 2010 regarding an advanced degree, and if it should be requirement for the CIO position. In 2017, more than 90 percent of the IMT members indicated the CIO should have an advanced degree. The IMT opinion is important because IMT members may write the senior technology leader job description as well as hire and supervise that person.

**CHART 53. IMT PERSPECTIVE: DEGREE CIO REQUIRED FOR THE CIO, 2010 TO 2017**

**TL LEADER OPINION OF CIO DEGREE**

The TLs were also surveyed about the required degree for the CIO, and 84 percent indicated it should be an advanced degree (see chart below).
CHART 54. TL PERSPECTIVE: DEGREE REQUIRED FOR THE CIO

The following chart compares the required CIO degree result for the three groups (TL, CIO and IMT).

CHART 55. COMPARISON OF CIO, IMT AND TL PERSPECTIVE OF REQUIRED CIO DEGREE
Preparation

The CIOs were asked about activities they believed were needed to prepare for the CIO role. The results are depicted in the chart below. Ninety percent or more selected Serving on college-wide committees supporting strategic initiatives and Be mentored by a CIO or other executive. The third most commonly selected activity was Engage in on-the-job training at 64 percent.

**CHART 56. CIO PERSPECTIVE: PREPARATION ACTIVITIES FOR CIO POSITION**

The chart below depicts the percentage of TLs between 2009 and 2018 who aspired to the CIO position and who possessed an advanced degree. The percentages have increased 10 percent since 2010 and almost reached the percentage for CIOs with advanced degrees.
Mentoring

In 2009 the percentage of TLs who wanted to become a CIO and were also being mentored by a CIO was 36 percent. The 2017 results for TLs and CIOs are depicted in the chart below. The percentage for this response steadily increased until 2014 when it reached a peak of 54 percent. It has since declined by 16 percent, its second lowest level.

CHART 58. TL MENTORED BY CIO, 2009 TO 2017

The percentage of TLs not being mentored reached a high of 41 percent in 2010. In 2017, it was 25 percent (see chart below).
Mentoring has been highlighted by the respondents as an important activity for aspiring CIOs. In 2018, 65 percent of CIOs indicated they were mentoring someone.

**CHART 60. CIOS - ARE YOU MENTORING SOMEONE?**

The following chart depicts CIO mentoring activity from 2010 to 2018.
The chart below depicts the percentage of TLs who were meeting regularly with their mentor from 2010 to 2017.

**CHART 61. CIOS WHO WERE MENTORING SOMEONE, 2010 TO 2018**

The following chart illustrates the percentage of TLs between 2010 and 2017 who said they were not engaged in any activity with their mentors. The response was at the second lowest level in 2017.

**CHART 62. TL MEETING REGULARLY WITH MENTOR, 2010 TO 2017**
In the CIO’s Absence

*On-the-job training* was identified as one of the ways to prepare for the CIO position, and one of the most frequently named preparation methods. Serving as the CIO in his or her absence would be an ideal form of on-the-job training for the aspiring CIO. The CIOs were asked if they had identified someone to serve in their place during an absence. Sixty-one percent of the CIOs indicated they had selected someone for this role.

**CHART 63. TL NOT ENGAGED IN ANY ACTIVITY WITH MENTOR, 2010 TO 2017**

**CHART 64. CIO: IS SOMEONE IDENTIFIED TO SERVE AS THE INTERIM CIO IN YOUR ABSENCE?**
The chart below depicts the percentage of CIOs from 2010 to 2018 who had selected someone to serve as interim in the CIO’s absence. The result has ranged from 55 to 62 percent.

**CHART 65. CIOS WHO IDENTIFIED SOMEONE TO SERVE AS CIO IN THEIR ABSENCE, 2010 TO 2018**

In an effort to get another view on the question of on-the-job training, the TLs were asked if they served as the leader in the CIO’s absence (see chart below). The single largest percentage (38 percent) indicated the role was rotated. Another 35 percent indicated they did, while 28 percent stated they did not serve in this role.

**CHART 66. IN THE CIO’S ABSENCE: TLS IN CHARGE WHILE THE CIO IS UNAVAILABLE (ALL RESPONDENTS)**
Planning for Succession

In some cases, CIOs have intentionally created a position to serve as the senior leader in the CIO’s absence. This position may be labeled the deputy CIO or another title. In 2018, 47 percent of the TLs indicated they served in such a position.

**CHART 67. IN A POSITION CREATED TO FILL IN FOR THE CIO**

For the third consecutive year, the percentage of TLs serving in a position created to fill in for the CIO reached a new high since 2009 (see chart below). TLs in this position will gain valuable experience to prepare them for a possible CIO job.

**CHART 68. TL IN A POSITION CREATED TO FILL IN FOR THE CIO, 2009 TO 2018**
**Previous Positions**

To further understanding about how TLs came to their current position, they named their two previous positions. The previous position results are depicted in the chart below. The vast majority of TLs worked in an IT department position in their last job.

**CHART 69. TL PREVIOUS POSITION TITLE**

The results for the TL’s title two positions prior to their current position are depicted in the chart below. Again, the majority of TLs worked in traditional IT department positions with a small percentage working as faculty or consultants.
In past versions of this research, the CIOs have been asked about their two previous positions, however, in 2018, it was not asked. The chart below depicts four CIO previous position responses between 2010 and 2017. CIO has consistently been the single most common response while a distant second has been the Executive Director.
CHECS has tracked senior IT executive titles since 2003. One of the most significant changes through the years has been the growth in the percentage of senior IT executives who hold the *Chief information officer* title. In the early 2000s, the *CIO* title was a title that technology executives wanted to have. In 2018, the percentage of respondents with *CIO* in their title was 60 percent (chart below).

**CHART 71. CIO PREVIOUS POSITIONS FROM 2010-2017**

In 2003, 32 percent of the senior IT executives held the *CIO* title. During the past 15 years, that percentage has almost doubled, reaching 63 percent in 2017 (chart below).
While CIO is the title that has steadily increased in use through the time the CHECS’ research has been conducted, there are other senior technology executive titles that have gained popularity. For instance, Chief technology officer (CTO) came into use in the early 2000s.

The CIOs were asked about the use of specific titles in their institution. The most commonly given title answer was Chief information security officer (CISO) at 33 percent, followed by the Chief information technology officer (CITO) at 22 percent (chart below). The CTO title, more than 15 years after it was introduced, was represented in only 11 percent of the institutions. Newer titles, such as Chief digital officer and chief innovation officer, had not risen above three percent. The Chief academic technology officer, the subject of a CHECS 2018 research report, was reported in four percent of the responses.
CHART 74. TITLES EXISTING IN CIO INSTITUTIONS

- Chief Technology Officer: 11% Yes, 89% No
- Chief Digital Officer: 0% Yes, 100% No
- Chief Academic Technology Officer: 4% Yes, 96% No
- Chief Information Technology Officer: 22% Yes, 78% No
- Chief Innovation Officer: 98% Yes, 2% No
- Chief Data Officer: 3% Yes, 97% No
- Chief Information Security Officer: 33% Yes, 67% No
Chief Information Officer Experience

PRIOR WORK EXPERIENCE

CHECS collected data about prior work experience. The CIOs selected one of four sectors where they had worked during the course of their career. The four areas are depicted in the figure below.

FIGURE 1. CIO PRIOR WORK EXPERIENCE AREAS

Higher education CIOs spent the bulk of their career in technology, whether it was in or out of higher education. On average, the CIOs spent almost 20 years working in IT Inside Higher Education. The next closest area was IT Outside of Higher Education at 7.26 years (figure below). This result clearly demonstrated the average higher education CIO spent the majority of their career working in an IT department whether it was in or outside of higher education.

FIGURE 2. AVERAGE CIO AREA WORK EXPERIENCE
The chart below provides another way of looking at the higher education CIO experience. Higher education CIOs have spent the majority of their careers, on average more than 25 years, in the technology field versus an average of six years outside of technology.

**CHART 75. AVERAGE CIO WORK EXPERIENCE INSIDE AND OUT OF INFORMATION TECHNOLOGY**

PRIOR INDUSTRY EXPERIENCE

CIOs participating in this study were categorized into five broad areas based on the industry they came from prior to their current position (see figure below). The areas were:

- **Higher Education**
- **Public Sector (local, state, or federal government)**
- **Healthcare**
- **Commercial or For profit**
- **Nonprofit Outside of Higher Education**.

More than 75 percent of CIOs worked in Higher Education prior to their current post. While 15 percent of CIOs worked in the For profit sector prior to their current position.
CHECS has debunked the myth that a large percentage of CIOs recently came into higher education from outside the industry. There were 79 percent of CIOs who worked in higher education prior to their current post (figure below).

**FIGURE 3. CIO PRIOR INDUSTRY EXPERIENCE**

A number of comparisons were made between the CIOs from the five sectors. However, the percentage of survey respondents from the Nonprofit, Healthcare, and Public sector were small. As a result, this discussion focused on the differences between the CIOs who worked in Higher Education for their last position and the CIOs who had worked in the Commercial or For profit sector.

The greatest difference between the Higher Education CIOs and those from the For profit sector was advanced degree. There were 76 percent of the Higher Education CIOs who had an advanced degree compared to 58 percent of the For profit sector CIOs. There was also a difference between Higher Education and the For profit sectors when it came to gender. There were 25 percent of the Higher Education CIOs who were women versus 17 percent of the For profit CIOs. In addition, there were more of the Higher Education CIOs predicting retirement in the next 10 years compared to the For profit CIOs or retirement plans.
CHART 76. CIO LAST-POSITION SECTOR COMPARISON

<table>
<thead>
<tr>
<th>Sector</th>
<th>CEO Reporting</th>
<th>IMT Member</th>
<th>Female</th>
<th>High school or equivalent</th>
<th>Associate's Degree</th>
<th>Bachelor's Degree</th>
<th>Master's Degree</th>
<th>Doctorate</th>
<th>Retire in 10 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonprofit</td>
<td>25%</td>
<td>25%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>25%</td>
<td>50%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Commercial</td>
<td>29%</td>
<td>57%</td>
<td>17%</td>
<td>3%</td>
<td>0%</td>
<td>40%</td>
<td>49%</td>
<td>9%</td>
<td>49%</td>
</tr>
<tr>
<td>Healthcare</td>
<td>50%</td>
<td>100%</td>
<td>60%</td>
<td>0%</td>
<td>0%</td>
<td>33%</td>
<td>67%</td>
<td>0%</td>
<td>67%</td>
</tr>
<tr>
<td>Public Sector</td>
<td>33%</td>
<td>50%</td>
<td>33%</td>
<td>17%</td>
<td>0%</td>
<td>0%</td>
<td>67%</td>
<td>17%</td>
<td>50%</td>
</tr>
<tr>
<td>Higher Education</td>
<td>36%</td>
<td>62%</td>
<td>25%</td>
<td>0%</td>
<td>2%</td>
<td>13%</td>
<td>65%</td>
<td>21%</td>
<td>58%</td>
</tr>
</tbody>
</table>
The CIOs who worked in the *Commercial/For profit* sector in their last position had been in their current position for an average of six years and nine months. This tenure is compared to the CIOs who worked in the *Higher education* sector in their last job; that group had been in their current position for an average of six years and three months. The chart below depicts this difference in time in position, which has been an ongoing results in this research. One reason for the difference might be that the *Commercial/For profit* CIO migration to higher education has been gradual and small percentages.

**CHART 77. YEARS IN CURRENT POSITION BY CIO SECTOR FOR LAST POSITION**

INTERNAL OR EXTERNAL CANDIDATES

In the past, more than 40 percent of the existing CIOs have been internal candidates for their positions. In 2018 that result continued with 43 percent of CIOs reporting they were employed by their current institution before becoming CIO (chart below). In comparison only 23 percent of CEOs were internal candidates for their positions (2015b).
The next chart depicts the percentage of CIOs from 2013 to 2018 who worked in their current institutions when they were selected to serve as the CIO. The percentage has not varied more than four percent since 2013.

The following chart depicts the internal and external CIOs by institution type. The institution type with the largest percentage of internal candidates, 55 percent was at Doctorate institutions followed by the Master’s institutions at 42 percent.
The next chart depicts the internal and external candidates categorized by different variables. The chart shows the following:

- Gender
- CIOs older than 51 years old
- Those retiring in the next 10 years
- Those with advanced degrees
- Those who report to the CEO
- Those serving on the IMT.

The largest difference between the internal and external CIOs was there was a greater percentage of external CIOs (67 percent) who were IMT members, while 54 percent of internal CIOs were IMT members. The next largest percentage difference was for CEO reporting with 39 percent of the external candidates reporting to the CEO versus 30 percent of the internal candidates.
**Age**

The age of the TLs who aspire to become a CIO may provide some indication about their experience and their retirement plans. Forty-five percent of the aspiring TLs were 51 years old or older (chart below). In 2018, 69 percent of the CIOs were 51 years or older.
CHART 82. AGE OF TL WHO WANTS TO BE A CIO

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>31-35</td>
<td>6%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>36-40</td>
<td>21%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>41-45</td>
<td>12%</td>
<td>10%</td>
<td>16%</td>
</tr>
<tr>
<td>46-50</td>
<td>15%</td>
<td>5%</td>
<td>47%</td>
</tr>
<tr>
<td>51-55</td>
<td>33%</td>
<td>30%</td>
<td>21%</td>
</tr>
<tr>
<td>56-60</td>
<td>9%</td>
<td>15%</td>
<td>11%</td>
</tr>
<tr>
<td>61-65</td>
<td>3%</td>
<td>20%</td>
<td>5%</td>
</tr>
<tr>
<td>66-70</td>
<td>0%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>71 and older</td>
<td>0%</td>
<td>10%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Timing of CIO Pursuit Effort

In the first five years of the TL research, the TLs were asked to select a year range to indicate when they would begin pursuit of a CIO role. In 2015, CHECS began collecting data for the specific number of years the TLs would wait before pursuing the CIO position. In 2017, that wait period was an average of 2.6 years.

The following chart illustrates the percent of TLs from 2009 to 2014 who planned to seek the CIO role within the next five years.

**CHART 83. TL PURSUING CIO ROLE IN NEXT FIVE YEARS, 2009 TO 2014**

Retirement Plans

In 2018, 57 percent of higher education CIOs predicted they would retire in the next decade. This high result has been consistent during this research’s lifetime. The TLs are, on average, younger than the CIOs, and not as many of them, 42 percent, are planning to retire within the same time period. However, this result was a new high for the research.
The CHECS TL research began in 2009 in response to a significant projected retirement of higher education CIOs. The percentage of TLs predicting they would retire in the next 10 years has increased by 20 percent since 2009 and reached a new high of 42 percent in 2017 (chart below).

**CHART 84. TL RETIREMENT PLANS**

The percentage of female CIOs had been rising between 2013 and 2016. However, in 2017 the percentage of female higher education CIOs declined to a near low. In comparison, 56 percent of college students are female (2017).

**CHART 85. TLS RETIRING IN NEXT 10 YEARS, 2009-2018**

**Gender**

The percentage of female CIOs had been rising between 2013 and 2016. However, in 2017 the percentage of female higher education CIOs declined to a near low. In comparison, 56 percent of college students are female (2017).

The pipeline for the female CIO population is the female TL who wants to be a CIO. In 2018, the female aspiring TL reached a new high of 33 percent. The aspiring female TL result from 2009 to 2018 is depicted in the chart below.
The percentage of female TLs, 40 percent, is depicted in the chart below. This was a new high for the CHECS TL research. Compared to higher education in general, the IT department has lagged in gender diversity. According to the *Chronicle of Higher Education*, in 2015 women made up 55 percent of the total employees in the executive, administrative, and managerial categories in higher education and furthermore, 30 percent of higher education CEOs were women (2017).

The next chart depicts the percentage of female TLs from 2009 to 2018.
The chart below depicts the differences in age by gender for the TL in 2018. There were more female TLs than male TLs in the 51-65 age ranges. There were 65 percent of female TLs in that age range versus 45 percent of the male TLs. This same kind of difference has existed in the CIO ranks with more female CIOs in the older age ranges.

**CHART 89. TL AGE AND GENDER**
Among male CIOs, the greatest percentage of them (22 percent) were in the 56-60 age group. Female CIOs also had the majority (38 percent) in this same age group. However, there were 88 percent of the female CIOs who were 51 years or older versus 63 percent of the male CIOs (chart below).

**CHART 90. CIO AGE AND GENDER**

In 2017, the percentage of CIOs who were women declined to 22 percent. This was the second lowest result since this question was first asked in 2008. In 2018, the percentage of CIOs who were women rose to 24 percent (chart below).

In Fortune 500 companies, 17 percent of CIOs were women (Zipkin, 2016). Female CIOs are discussed more fully in this report under “The Female Chief Information Officer” section. The following chart depicts CIOs by gender since 2008.
In 2017, the percentage of women who were members of the IMT was 38 percent. This result was significantly higher than the percentage of female CIOs. The following chart depicts the gender of IMT respondents in 2017.

**chart 92. 2017 IMT by gender**

Race

The CHECS surveys have asked about the race of the respondents since 2010. The TL and CIO surveys collected racial data as follows: Native Hawaiian or other Pacific Islander, American Indian or Alaskan native, Asian, Black or African American, White, or Decline to answer. The CIOs and TLs have not been a racially diverse population.
Furthermore, they have not represented the population working in or attending higher education institutions. In 2018, six percent of the TLs were minorities (chart below). In comparison, 27 percent of all higher education employees and 17 percent of presidents were minorities (2017). Furthermore, in 2016, 33 percent of freshman at four-year colleges were minorities and 52 percent of all enrollments in the United States were white (2017).

**CHART 93. TL RACE**
The minority percentages for TLs from 2010 to 2018 are depicted in the next chart. The percentage of TLs who were minorities has never risen above eight percent.

**CHART 94. PERCENTAGE OF MINORITY TLS, 2010 TO 2018**

In 2018, 89 percent of CIOs identified themselves as *White* (chart below). Minorities represented eight percent of higher education CIOs. Four percent of the respondents *Declined to answer*. In comparison, 73 percent of the population in the United States was White in 2016 (2017).

**CHART 95. CIOS AND RACE**

The racial diversity of the IMT membership has been similar to the CIOs and TLs. In 2017, 83 percent of the IMT respondents identified themselves as *White* (chart below). Eight percent were *Black or African American* and 10 percent chose *Decline to answer*. 
Since 2010, CHECS surveys have gathered information about Hispanic TLs, CIOs and IMTs. The percentage of Hispanic TLs was three percent (chart below). In contrast, the percentage of U.S. Hispanic college students was 16 percent (2017).

**CHART 97. HISPANIC TLS**

The percentage of Hispanic TLs has never been higher than four percent. The results from 2010 to 2018 are depicted in the chart below.
Only two percent of higher education CIOs identified themselves as *Hispanic* (chart below).

**CHART 99. HIGHER EDUCATION CIOS IDENTIFIED AS HISPANIC**

In 2017, none of the IMTs identified themselves as *Hispanic* (chart below).

**CHART 100. IMT MEMBERS IDENTIFIED AS HISPANIC IN 2017**
The TLs were asked if they thought discrimination contributed to less diversity. Thirty-eight percent of the TLs believed it did, and 19 percent indicated they were not sure (chart below).

**CHART 101. TL DISCRIMINATION OPINION**

The CIOs were also asked whether they thought discrimination contributed to less gender diversity. The results are depicted in the chart below. Forty-two percent of all CIOs did not believe it did, 28 percent believed it did, and a quarter of respondents were unsure.

**CHART 102. CIO DISCRIMINATION OPINION**
The chart below breaks down the CIO responses to the discrimination question by gender and race. There were only 22 percent of the male CIOs who indicated yes to the question while 48 percent of them said no to the question. There were almost 50 percent of the female CIOs who answered yes and 71 percent of the Black or African American respondents who said yes. A point to consider in the evaluation of this information is that the percentage of minority CIOs is small and may skew the results.

**CHART 103. CIO DISCRIMINATION OPINION GENDER AND RACE COMPARISON**

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th>American Indian or Alaska Native</th>
<th>Asian</th>
<th>Black or African American</th>
<th>Native Hawaiian or other Pacific Islander</th>
<th>White</th>
<th>Decline to answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>49%</td>
<td>22%</td>
<td>0%</td>
<td>50%</td>
<td>71%</td>
<td>100%</td>
<td>26%</td>
<td>33%</td>
</tr>
<tr>
<td>No</td>
<td>25%</td>
<td>48%</td>
<td>20%</td>
<td>25%</td>
<td>0%</td>
<td>0%</td>
<td>45%</td>
<td>44%</td>
</tr>
<tr>
<td>Unsure</td>
<td>24%</td>
<td>24%</td>
<td>60%</td>
<td>0%</td>
<td>29%</td>
<td>0%</td>
<td>26%</td>
<td>11%</td>
</tr>
<tr>
<td>Decline to answer</td>
<td>2%</td>
<td>6%</td>
<td>20%</td>
<td>25%</td>
<td>0%</td>
<td>0%</td>
<td>4%</td>
<td>11%</td>
</tr>
</tbody>
</table>
As mentioned earlier in this report, there has been a consistent lack of diversity in the CHECS higher education CIOs and TLs research. For instance, the percentage of female CIOs has only risen above 25 percent twice since 2008 (chart below).

The reasons behind this gender disparity are complex. Undoubtedly, the lack of gender diversity in the TL ranks is one of the reasons. Female representation for TLs has been just over a third of the total TLs. Furthermore, there have been less of the female TLs who expressed an interest in pursuing a CIO position. In addition, the female CIOs have been older than their male counterparts and their stated intention is to retire sooner than the male CIOs. Other reasons may include low female representation in technology degree programs and under representation of women in the IT department.

**CHART 104. CIO BY GENDER FROM 2008 TO 2018**

The chart below depicts four trends that may provide some insight into the future of the percentage of female CIOs in higher education. The trends are:

- The percentage of female TLs
- The percentage of female CIOs
- The percentage of female CIOs planning to retire in the next decade
- The percentage of female TLs interested in becoming a CIO

In 2018, the percentage of female CIOs predicting retirement in the next 10 years reached a new high of 69 percent. The percentage of female TLs also reached a new high albeit at a smaller number—40 percent. In a second encouraging result, the percentage of female TLs who expressed an interest in becoming a CIO rose to a new high of 38 percent.
The Female CIO: Age

The age distribution of female CIOs in 2018 is presented in the chart below. There were 87 percent of the respondents who were 51 years or older. The peak for the group, 38 percent, was between 56 and 60 years old.
Among male CIOs, their age peak, 22 percent, was in the same age group as the women's peak, the 56-to-60-year-old group (chart below). However, the male CIOs had higher percentages at both ends of the bell curve. For instance, there were more men from 31 to 50 years old and from 61 to over 71 years old. This observation supports the earlier retirement plans of the female CIOs.
The Female CIO: Race

The chart below shows the CIO race broken down by gender. There were two percent of the female CIOs who were minorities and nine percent of male CIOs who were minorities. There were three percent of the male CIOs who declined to answer this question versus five percent of the female CIOs.
The Female CIO: Education

There were some gender differences for CIO degree level (chart below). Seventy-five percent of female CIOs had an advanced degree compared to eighty-two percent of the male CIOs.
CHECS also collected data on CIOs’ degree majors (chart below). The largest difference between the female and male CIOs was for the *education* major, where 16 percent of the female CIOs held the major versus nine percent of the male CIOs. There were 27 percent of the male CIOs with a *technology* major versus 21 percent of the female CIOs. The single largest percentage for female CIOs, 25 percent, was the *business* degree where male CIOs accounted for 26 percent of the total.
The Female CIO: Reporting Structure

The reporting structure for CIOs by gender is depicted in the chart below. The percentage of CIOs reporting to the president or CEO was 37 percent for male CIOs and 33 percent for female CIOs. There were four percent of the female CIOs who reported two or more levels from the CEO versus one percent of the male CIOs.
The Female CIO: Institution Management Team Membership

IMT membership for CIOs has remained relatively the same over the time this research has been conducted. In 2018, there were six percent more of the female CIOs who served on the IMT than their male counterparts (chart below).

**The Female CIO: Career Path**

The chart below depicts the last title held by female and male CIOs. The largest difference was for the CIO title, where almost 40 percent of the male respondents had been CIOs in their last position versus 25 percent of the female respondents. This result
indicates more female CIOs were new to the CIO role. Eleven percent of the female CIOs were deputy CIOs in their last position compared to seven percent of the male CIOs.

**CHART 113. 2017 LAST TITLE HELD PRIOR TO CIO BY GENDER**

As mentioned earlier in this report, CHECS also examined the CIO’s last position by sector; the sectors were defined into five broad categories.

- **Higher Education**
- **Public** (local, state, or federal government)
- **Healthcare**
- **Commercial** (for-profit outside of higher education)
- **Nonprofit Outside of Higher Education**
The percentage of women who worked in Higher Education in their last sector, 80 percent, was similar to the result for the male CIOs at 78 percent (chart below). There were five percent more of the male CIOs who worked in the commercial sector than their female counterparts.

**CHART 114. LAST SECTOR BY GENDER**

The CHECS CIO survey asked the respondents whether they worked in their current institution before they became the CIO. Among the women, 46 percent were internal candidates versus 42 percent of the male CIOs (chart below).
The Female CIO: Salary

The gender difference for CIO salaries from 2013 to 2018 is shown in the chart below. In 2018, the average female CIO salary was $161,892 versus $149,230 for male CIOs. Both groups reached a new salary high for this research. 2018 was not the first year that female CIOs earned more than male CIOs. In fact, since this data was first gathered in 2012, male CIOs have only earned more than the female CIOs in one year—2016.

In 2014 and 2015, female CIOs earned approximately $11,000 more per year than male CIOs. In 2013, CHECS found women were paid more than men; however, the salary gap was not as great as 2014 and 2015 with men earning $5,500 less than women.
The Female CIO: Tenure

In 2018, the average tenure for male CIOs was six years and one month. The female CIO tenure was seven years and three months (chart below).

**CHART 117. TENURE BY GENDER**

![Chart showing tenure by gender](chart)

The Female CIO: Retirement Plans

In this research, the percentage of female CIOs predicting their retirement in the next 10 years has been higher than their male counterparts. In 2018, 69 percent of female CIOs indicated they were going to retire during the next decade versus 51 percent of the male CIOs (chart below). This result was a new high for female CIO retirement plans.
CHART 118. RETIREMENT PLANS BY GENDER

<table>
<thead>
<tr>
<th></th>
<th>1-5 years</th>
<th>6-10 years</th>
<th>11-15 years</th>
<th>16-20 years</th>
<th>21 years or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>26%</td>
<td>25%</td>
<td>15%</td>
<td>20%</td>
<td>14%</td>
</tr>
<tr>
<td>Women</td>
<td>40%</td>
<td>29%</td>
<td>18%</td>
<td>7%</td>
<td>5%</td>
</tr>
</tbody>
</table>
CIO ROLES AND EFFECTIVENESS

Roles and Effectiveness

CHECS’ CIO and IMT surveys focused on the higher education CIO operating in seven roles. The IMTs (other VPs and institution presidents) and the CIOs rated the importance of these roles and how effective the CIO was operating in them.

The roles’ importance ratings give the CIO some understanding of the priority placed on them. For example, a role with a low rating is likely not high on a priority list either. The effectiveness ratings illustrate whether the CIO was effective operating in the roles deemed important to the CIO and, perhaps more importantly, the roles the IMTs valued.

CIO responsibilities generally fall into one of the seven broad roles listed below. These roles represent the typical tasks CIOs undertake within an organization.

The roles and descriptions are noted below.

FIGURE 4. SEVEN CIO ROLES

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Partner</td>
<td>• Organizational strategic planning and revising business processes</td>
</tr>
<tr>
<td>Classic IT Support Provider</td>
<td>• Foundations of IT support and responsive department</td>
</tr>
<tr>
<td>Contract Oversight</td>
<td>• Relationships with IT vendors, contract negotiation, and contract supervision</td>
</tr>
<tr>
<td>Informaticist and IT Strategist</td>
<td>• Ensure security and accuracy of institutional data and alignment of IT department with the institution</td>
</tr>
<tr>
<td>Integrator</td>
<td>• Integration of all internal and external systems</td>
</tr>
<tr>
<td>IT Educator</td>
<td>• Evangelist for computer use and understanding; educator of employees regarding IT innovations bringing value to the organization</td>
</tr>
<tr>
<td>Profession Advocate</td>
<td>• Supports professional organizations; actively involved in professional organizations; participates in national higher education IT initiatives</td>
</tr>
</tbody>
</table>
These seven roles can be categorized into a hierarchy with the base roles considered to be foundational to the CIO position (figure below). Foundational roles are those functions the CIO is expected to operate in and provide services which likely remain unnoticed as long as the CIO is effective, such as **Contract Oversight** and **Classic IT Support Provider**. The midsection holds tactical functions and represent the **Informaticist** and **Integrator** roles. The hierarchy crest is capped by strategic roles and those to which the CIO may aspire, **Business Partner** and **IT Educator**.

**FIGURE 5. HIERARCHY OF CIO ROLES**

Examining the seven CIO roles required gathering information regarding how CIOs viewed both the importance of the role and their effectiveness performing that responsibility. CIOs and IMTs were presented with the roles and a brief definition of each; they were asked to rate each role’s importance and the CIO’s effectiveness operating in the roles (see figure below).

The roles were ranked using a 1 to 5 scale with 1 representing **No Importance** or **Expectations Not Met** and 5 representing **Critically Important** or **Outstanding**. The responses were aggregated into an average importance and effectiveness rating for each of the seven roles.
FIGURE 6. IMPORTANCE AND EFFECTIVENESS RATING SCALE

<table>
<thead>
<tr>
<th>IMPORTANCE</th>
<th>EFFECTIVENESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No importance</td>
<td>Expectations not met</td>
</tr>
<tr>
<td>Least importance</td>
<td>Could be better</td>
</tr>
<tr>
<td>Important</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Very important</td>
<td>Excellent</td>
</tr>
<tr>
<td>Critically important</td>
<td>Outstanding</td>
</tr>
</tbody>
</table>

The averages for CIO perception of *Role Importance* and *Effectiveness* are depicted in the chart below. CIOs ranked **Classic IT Support Provider** as the most important role followed closely by the **Informaticist** and **IT Strategist**. At the other end of the importance scale, **IT Educator** and **Profession Advocate** ranked sixth and seventh. The **Profession Advocate** role was an average of 2.9, ranked *Least Importance* by the CIOs. These lower ranking CIO-role importance results have been a consistent result in prior years of this research.

The CIOs ranked themselves highest in effectiveness for **Classic IT Support Provider** followed by **Contract Oversight**. They considered themselves least effective in the **IT Educator** and **Profession Advocate**. CIOs also rated these last two roles least important. This finding is another consistent CHECS research result.
In 2017, the IMTs proffered another point of view. The IMT data is reflected in the chart below. Like the CIOs, the IMTs ranked **Classic IT Support** as the most important CIO role and **IT Educator** and **Profession Advocate** as the least important roles. As with the 2015 and 2016 findings, IMTs indicated CIOs were most **Effective** in **Contract Oversight**, a foundational role, and the least **Effective** as the **IT Educator**, a strategic role. The IMT group ranked CIOs second highest in **Effectiveness** for **Classic IT Support**, another foundational role. As a **Business Partner**, a strategic role, IMTs ranked CIO **Effectiveness** as 3.64 on the five-point scale.
The higher education CIO role is complex, and the debate is ongoing about the required skills, attributes, backgrounds, conditions, and other factors which can have an impact on their effectiveness. This portion of the CHECS research focuses on four attributes which, throughout the life of this research, has had an impact on the IMT’s view of CIO Effectiveness. The attributes are:

- Communication Skills
- IT Knowledge
- Political Savvy
- Strategic Business Knowledge

Examples of these CIO attributes are provided in the table below.
TABLE 2. CIO ATTRIBUTES

<table>
<thead>
<tr>
<th>ATTRIBUTE</th>
<th>EXAMPLES</th>
</tr>
</thead>
</table>
| Communication Skills            | Fluent in business language
                               | Fluent in higher education language
                               | Able to communicate and present information without technical terms to non-technical people |
| IT Knowledge                    | Understands how IT is applied in the organization
                               | Able to use current IT resources to fill institutional requirements
                               | Uses new technology for the institution
                               | Familiar with the acquisition of IT |
| Political savvy                 | Able to assess situations that might be confrontational and act tactfully |
                               | Able to work well with the majority of people |
| Strategic Business Knowledge    | Knowledge of institutional offerings
                               | Understanding of market and business processes
                               | Familiar with the competition |

In 2017, the IMTs provided their opinions about these four CIO attributes through a series of questions. IMTs evaluated the attributes using a one-to-five scale with one representing *Was Not Informed or Not Effective* and five representing *Well Informed or Extremely Effective*.

The responses were aggregated to create an average for each attribute (table below). Those averages were analyzed to determine if there was a correlation between the attributes and the IMTs’ perception of CIO Role Effectiveness. In every year this research has been conducted, there was a correlation between CIO attributes and IMT-perceived CIO Effectiveness. In 2017, there was a correlation between the IMT perception of the four attributes and IMT perception of CIO Effectiveness operating in the seven CIO roles. The IMT rating of the CIO attributes are displayed in the table below.
TABLE 3. 2017 CIO ATTRIBUTES RESULTS

<table>
<thead>
<tr>
<th>ATTRIBUTE</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Business Knowledge</td>
<td>3.72</td>
</tr>
<tr>
<td>IT Knowledge</td>
<td>3.57</td>
</tr>
<tr>
<td>Political Savvy</td>
<td>3.43</td>
</tr>
<tr>
<td>Communication Skills</td>
<td>3.37</td>
</tr>
</tbody>
</table>

EFFECTIVENESS AND REPORTING TO THE CHIEF EXECUTIVE OFFICER

The data was also examined to see if CIO reporting structure had an impact on perceived Effectiveness. In 2018, there was no statistically significant difference between the CIOs who reported to the CEO and those who did not.

From the CIO perspective, reporting structure did not make a difference in 2017 either. In 2016, CIOs who reported to the CEO viewed themselves as more effective than those who did not report to the CEO, and the results were statistically significant. The chart below depicts the 2016 through 2018 Effectiveness ratings for both the CIOs who reported to the CEO and those who did not.

CHART 121. 2016-2018 CIO PERSPECTIVE: EFFECTIVENESS BASED ON REPORTING STRUCTURE
In 2018, those CIOs who served on the IMT believed they were more effective than those who were not on the management team. The result, depicted below, was not statistically significant.

**TABLE 4. CIO: IMT MEMBERSHIP INFLUENCE ON EFFECTIVENESS**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>IMT MEMBER</th>
<th>NONMEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>3.58</td>
<td>3.53</td>
</tr>
</tbody>
</table>

A depiction of the 2016-2018 results for this question is below.

**CHART 122. CIO PERSPECTIVE: EFFECTIVENESS BASED ON IMT MEMBERSHIP**

Throughout this research, CIOs have wavered on whether CIOs who served on the management team were more or less effective. The table below depicts each study year and if there was a statistically significant difference in Effectiveness. In seven of 14 years, CIOs have indicated IMT membership did not have an influence on their effectiveness.
TABLE 5. CIO PERSPECTIVE ON IMT MEMBERSHIP IMPACT ON CIO EFFECTIVENESS

<table>
<thead>
<tr>
<th>Year</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>✓</td>
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</tr>
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<tr>
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<td>2009</td>
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<tr>
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<td>2017</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

Institution Management Team Membership

In 2018, 61 percent of CIOs were members of the IMT. This result is a new high for the question. In 2005, IMT membership was 66 percent; however, that year only community college CIOs were examined. The chart below depicts the IMT membership percentage through the years of this study.
Over the past four years, this research has examined IMT membership and CIO education degree level. While causation cannot be claimed with respect to an advanced degree and IMT membership, there does appear to be a link. In 2018, as in the three previous years, a greater percentage of doctorate-holding CIOs served on the IMT than those with a master’s degree. Furthermore, there was a greater percentage of those with a master’s degree serving on the IMT than those with a bachelor’s degree.

While having an advanced degree may have some impact on whether the CIO is an IMT member, there may be other factors which also influence the IMT membership, such as CIOs with advanced degrees seeking positions with certain characteristics such as IMT membership. The CIO’s IMT membership status compared by degree level are illustrated below.
Reporting Structure

In the past, the majority of higher education CIOs have reported to one of three different positions: President, Provost, or Chief Financial Officer (CFO). In 2018, 34 percent reported to the CEO and another 64 percent reported one level away from the CEO (see figure below). These reporting structure percentages have been consistent in the years this research has been conducted.
FIGURE 7. CIO REPORTING STRUCTURE: ORGANIZATIONAL LEVELS FROM THE CEO

The longitudinal CHECS data shows nearly all CIOs were within one reporting level from or reported directly to the CEO. For the seventh year in a row, the combination of the two reporting structures represented 97 percent of responses or more (chart below).

CHART 125. PERCENTAGE OF CIOS WHO REPORTED ONE LEVEL OR LESS FROM CEO

Between 2003 and 2018, the percentage of higher education CIOs reporting to the institution president remained in the 30-percent range. The 2017 result marked a new low at 31 percent (see chart below). In 2018, the result rebounded to 34 percent.
The CIO respondents to the survey contrasted their ideal and actual reporting structure. More than three quarters of the respondents indicated they believed they should report to the CEO, while only 34 percent of them did report to the CEO. Nine percent of the CIOs thought they should report to the CFO, while eight percent indicated the Provost was the ideal position to whom the CIO should report. The results are in the chart below.

Until 2017, CIOs reporting to the CEO was always the single largest percentage in this research. In 2017, the single largest percentage of CIOs reported to the CFO. In 2018, CIOs reporting to the CEO and CFO were both 34 percent of the respondents. In cross-industry surveys, the CIO reported to the CEO in 46 percent of the responses (2016).
The CIO reporting structure was also examined by looking at the CIOs academic degree levels. Among the CIOs with a doctorate degree, 45 percent reported directly to the CEO while only 31 percent of those with a master’s degree and 40 percent with a bachelor’s degree reported to the CEO (chart below).
Among IMTs in 2017, the reporting structure percentages were quite different than for CIOs. Two thirds of the IMTs reported to the CEO. Another 13 percent of the IMT respondents were CEOs, who reported to the Board of Trustees. The IMT reporting is depicted below.

**CHART 129. 2017 REPORTING STRUCTURE FOR IMT**

<table>
<thead>
<tr>
<th>Other VP</th>
<th>Senior or Executive VP</th>
<th>Other, please specify</th>
<th>Chief Academic Officer/Provost</th>
<th>Board of Trustees</th>
<th>Chief Executive Officer/President</th>
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</thead>
<tbody>
<tr>
<td>Series1</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>8%</td>
<td>13%</td>
</tr>
</tbody>
</table>
CHIEF INFORMATION OFFICER CHARACTERISTICS

Scope of Responsibility

There were 71 percent of CIO respondents who indicated they spent *More time on IT and institution strategy* (chart below). Only 19 percent of CIOs indicated they spent *More time on day-to-day tasks.*

**CHART 130. CIO WORK FOCUS**

Since 2011, the majority of CIOs have focused on IT department and institution strategy. The percentage has remained between 60 and 75 percent during that time (chart below).
In 2017, IMTs agreed with how the CIOs spent their time. There were 65 percent of IMTs who indicated CIOs spent more time on institution and technology department strategy (chart below).

**CHART 132. 2017 IMT PERSPECTIVE: CIO WORK FOCUS**

The CIOs were asked which areas they led in addition to the IT department. The four most commonly reported areas are depicted in the chart below. Over two-thirds of CIOs only led the IT department. While CIO leadership of the library continued to hover close to 10 percent.
The next two tables depict the 2003-2018 results for findings from the CIO research and the 2009-2018 results for findings from the TL research.
## 6. HIGHER EDUCATION TL STUDY RESULTS, 2009 TO 2018

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Age - percentage older than 51 years old</td>
<td>32</td>
<td>33</td>
<td>41</td>
<td>38</td>
<td>47</td>
<td>44</td>
<td>46</td>
<td>59</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>Female TL percentage</td>
<td>33</td>
<td>37</td>
<td>37</td>
<td>37</td>
<td>40</td>
<td>39</td>
<td>33</td>
<td>35</td>
<td>38</td>
<td>40</td>
</tr>
<tr>
<td>Percentage of minority TLs</td>
<td>NM</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Percentage of Hispanic TLs</td>
<td>NM</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
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<tr>
<td>TL tenure in current position</td>
<td>4 yr., 9 mo.</td>
<td>5 yr., 4 mo.</td>
<td>6 yr., 1 mo.</td>
<td>6 yr., 5 mo.</td>
<td>7 yr., 8 mo.</td>
<td>5 yr., 10 mo.</td>
<td>6 yr., 5 mo.</td>
<td>6 yr., 1 mo.</td>
<td>6 yr., 1 mo.</td>
<td>6 yr., 6 mo.</td>
</tr>
<tr>
<td>Percentage of TLs retiring in next 10 years</td>
<td>22</td>
<td>26</td>
<td>35</td>
<td>32</td>
<td>34</td>
<td>32</td>
<td>32</td>
<td>38</td>
<td>42</td>
<td>32</td>
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<tr>
<td>Percentage of TLs with no certification</td>
<td>NM</td>
<td>72</td>
<td>72</td>
<td>66</td>
<td>66</td>
<td>63</td>
<td>59</td>
<td>50</td>
<td>56</td>
<td>50</td>
</tr>
<tr>
<td>Percentage of TLs with advanced degree</td>
<td>61</td>
<td>64</td>
<td>64</td>
<td>67</td>
<td>67</td>
<td>73</td>
<td>65</td>
<td>67</td>
<td>67</td>
<td>69</td>
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<tr>
<td>Percentage of TLs with technology major</td>
<td>31</td>
<td>30</td>
<td>37</td>
<td>33</td>
<td>34</td>
<td>29</td>
<td>25</td>
<td>24</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Percentage of CIOs with someone identified to serve as CIO in their absence</td>
<td>NM</td>
<td>59</td>
<td>58</td>
<td>61</td>
<td>62</td>
<td>58</td>
<td>55</td>
<td>55</td>
<td>58</td>
<td>61</td>
</tr>
<tr>
<td>Percentage of TLs who wanted to become a CIO</td>
<td>69</td>
<td>65</td>
<td>61</td>
<td>63</td>
<td>54</td>
<td>63</td>
<td>66</td>
<td>55</td>
<td>49</td>
<td>47</td>
</tr>
<tr>
<td>Aspiring TLs retiring in 10 years</td>
<td>15</td>
<td>13</td>
<td>19</td>
<td>17</td>
<td>21</td>
<td>17</td>
<td>16</td>
<td>27</td>
<td>26</td>
<td>32</td>
</tr>
<tr>
<td>Percentage of TLs pursuing CIO position in five years</td>
<td>86</td>
<td>80</td>
<td>81</td>
<td>84</td>
<td>86</td>
<td>87</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
</tr>
<tr>
<td>Percentage of aspiring TLs who were women</td>
<td>28</td>
<td>26</td>
<td>29</td>
<td>29</td>
<td>29</td>
<td>31</td>
<td>24</td>
<td>24</td>
<td>22</td>
<td>33</td>
</tr>
<tr>
<td>Percentage of aspiring TLs being mentored by CIO</td>
<td>36</td>
<td>40</td>
<td>46</td>
<td>40</td>
<td>40</td>
<td>54</td>
<td>53</td>
<td>47</td>
<td>38</td>
<td>NM</td>
</tr>
<tr>
<td>Percentage of TLs meeting regularly with mentor</td>
<td>NM</td>
<td>43</td>
<td>49</td>
<td>42</td>
<td>40</td>
<td>57</td>
<td>53</td>
<td>38</td>
<td>49</td>
<td>NM</td>
</tr>
<tr>
<td>Percentage of TLs not engaged in any activity with mentor</td>
<td>NM</td>
<td>44</td>
<td>34</td>
<td>42</td>
<td>40</td>
<td>23</td>
<td>32</td>
<td>40</td>
<td>28</td>
<td>NM</td>
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</tbody>
</table>

NM = Not measured
### TABLE 7. HIGHER EDUCATION CIO STUDY RESULTS, 2003 TO 2018

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Attributes have an impact on</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>NM</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>NM</td>
</tr>
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<td>effectiveness?</td>
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<tr>
<td>CEO reporting has an impact</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NM</td>
<td>No</td>
<td>No</td>
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<td>No</td>
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<tr>
<td>on effectiveness (IMT)?</td>
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</tr>
<tr>
<td>Time in position</td>
<td>5 years 3 mo.</td>
<td>6 years 5 mo.</td>
<td>7 years 5 mo.</td>
<td>6 years 7 mo.</td>
<td>6 years 10 mo.</td>
<td>6 years 8 mo.</td>
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<td>7 years 5 mo.</td>
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<td>6 years 9 mo.</td>
<td>6 years 8 mo.</td>
<td>6 years 9 mo.</td>
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<tr>
<td>Average time in higher-</td>
<td>NM</td>
<td>NM</td>
<td>15.70 years</td>
<td>13.45 years</td>
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<td>13.83 years</td>
<td>13.66 years</td>
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<td>15.06 years</td>
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<td>17.09 years</td>
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<td>17.71 years</td>
<td>19.90 years</td>
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<tr>
<td>education IT</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage with advanced degree</td>
<td>82</td>
<td>68</td>
<td>75</td>
<td>76</td>
<td>77</td>
<td>79</td>
<td>76</td>
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<td>81</td>
<td>78</td>
<td>82</td>
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<td>81</td>
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<tr>
<td>Percentage Retiring in next 10</td>
<td>NM</td>
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<td>45</td>
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</tr>
<tr>
<td>Gender percentage</td>
<td>NM</td>
<td>NM</td>
<td>NM</td>
<td>26 female</td>
<td>24 female</td>
<td>23 female</td>
<td>23 female</td>
<td>22 female</td>
<td>21 female</td>
<td>22 female</td>
<td>25 female</td>
<td>28 female</td>
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<td>24 female</td>
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<tr>
<td>Percentage</td>
<td></td>
<td></td>
<td></td>
<td>74 male</td>
<td>76 male</td>
<td>77 male</td>
<td>77 male</td>
<td>78 male</td>
<td>79 male</td>
<td>78 male</td>
<td>75 male</td>
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<td>Minority Percentage</td>
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NM - Not measured
REFERENCES

(2015a, January 5). 2015 State of the CIO. CIO.


ABOUT CHECS

CHECS was founded in 2009 by Dr. Wayne A. Brown to enable continued studies focusing on higher education CIOs’ attributes, education, experience and effectiveness. The research is unique from other CIO studies in that it is a two-part survey involving the CIO as well as other members of the institution management team. The annual study invites participation from the CIO (or senior technology person) at every two- and four-year higher education institution in the United States and other international institutions. Survey responses are analyzed in aggregate and statistical data is extracted and synthesized into an annual report. The CIO study has been conducted since 2003.

In 2009, CHECS launched a second study focusing on those individuals in the next organizational layer down from the CIO. This survey is administered to higher education technology leaders and CIOs are asked some of the same questions to create the Higher Education Technology Leadership Study: The Chief Information Officers of the Future.

CHECS also conducts a chief information security officer (CISO) study that began in 2014. Like the other two reports, the CISO research is based on multiple perspectives, gathered through one survey completed by higher education CISOs and a similar survey completed by CIOs.

CHECS is a nonprofit (501c3) organization dedicated to the education and development of the higher education chief information officer. The organization and studies are funded through report sales, subscriptions, and sponsor donations.

To help future technology leaders, CHECS has endowed scholarships. To date, nearly $100,000 has been donated to these endowments. In 2010, CHECS began funding a scholarship endowment to benefit higher education technology management doctoral students at Nova Southeastern University. CHECS funds a second scholarship endowment at University of Texas, Austin, to benefit undergraduate students seeking a higher education technology management degree. In 2014, CHECS began funding a third scholarship at Florida State University to benefit students in the Management Information Systems programs. CHECS also endowed a scholarship at Excelsior College.

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ABOUT WAYNE BROWN

Wayne A. Brown, Ph.D., is the Chief Executive Officer and Founder of CHECS. He worked as a chief information officer since the mid-1990s and worked in higher education at colleges in San Francisco, Kansas, and New York. In 2017, he was named Excelsior College’s Vice President for Information Technology Emeritus. Prior to his academic career, he was in the U.S. Air Force for more than 20 years, serving in the Medical Service Corps, Education and Training, and Security Forces. In addition to serving as a CIO, Dr. Brown has been a higher education instructor for more than a decade. He is an online instructor for Purdue University Global and Excelsior College, teaching leadership and technology management.

Dr. Brown began researching the higher education chief information officer roles and effectiveness as a doctoral dissertation. He found that others in the field shared his keen interest in the topic, but it was not well served or researched. He has continued the surveys almost every year since 2003. Dr. Brown’s work has been widely published in higher education and technology publications, such as Chronicle for Higher Education, Information Week, CIO, Inside Higher Ed, Public CIO, EDUCAUSE Quarterly, League of Innovation in the Community College, Gartner, EDUCAUSE Review, CIO, and Campus Technology, and he has presented research findings at technology conferences throughout the United States.