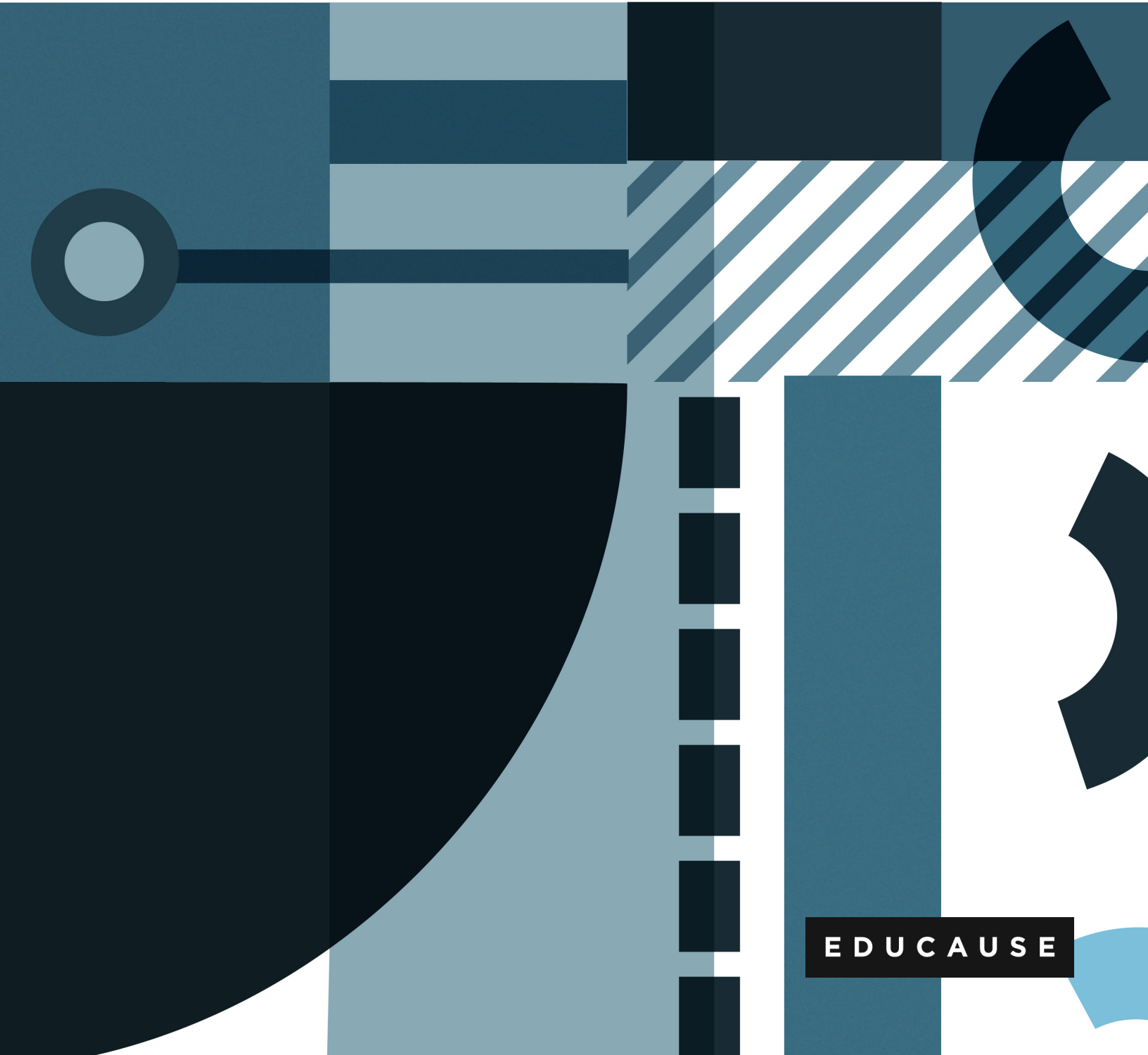


# The Higher Education IT Salary Report, 2019



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### Citation

Shulman, Ben, and D. Christopher Brooks. *The Higher Education IT Salary Report, 2019*. Research report. Louisville, CO: ECAR, August 2019.

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## Introduction

People who work in higher education do so for a variety of reasons, but money isn't typically one of them. Indeed, monetary compensation ranks eleventh among factors keeping higher education IT employees at their current institution—behind such factors as quality of life, the work environment, their boss and campus leadership, occupational stability, and benefits. That said, money does matter. Few of us have the luxury of working for free, and our incomes should ideally be a fair reflection of the work we do and should enable us to meet our needs and live comfortably. And higher education IT employees are paid well, even by private-sector standards; the median of all higher education IT salaries across all position types is \$90,000, or about \$3,700 more than the median salary of computer and IT occupations in the US.<sup>1</sup> There are, of course, some significant differences in salary across organizational levels, with CIOs earning the most (\$140,000) followed by managers (\$100,000) and IT staff (\$70,000).

To better understand how various factors shape the salaries of higher education IT professionals, we published the *Higher Education IT Salary Report, 2016*.<sup>2</sup> In that report, we identified a host of variables related to individual demographics and career paths, characteristics of current positions, and characteristics of current institutions that we thought would have an impact on determining the salaries of IT staff, managers, and CIOs. These included gender, generation, ethnicity, education level, years of experience (in higher education, at current institution, in current position), and Carnegie class. We included presidential cabinet membership for CIOs. For managers and CIOs, we included the number of direct reports. For staff and managers, we also included the IT sector in which their position falls. In this year's report, we build upon these earlier findings by revisiting the original predictors and considering others that help us to understand why and how higher education IT employees earn what they earn.

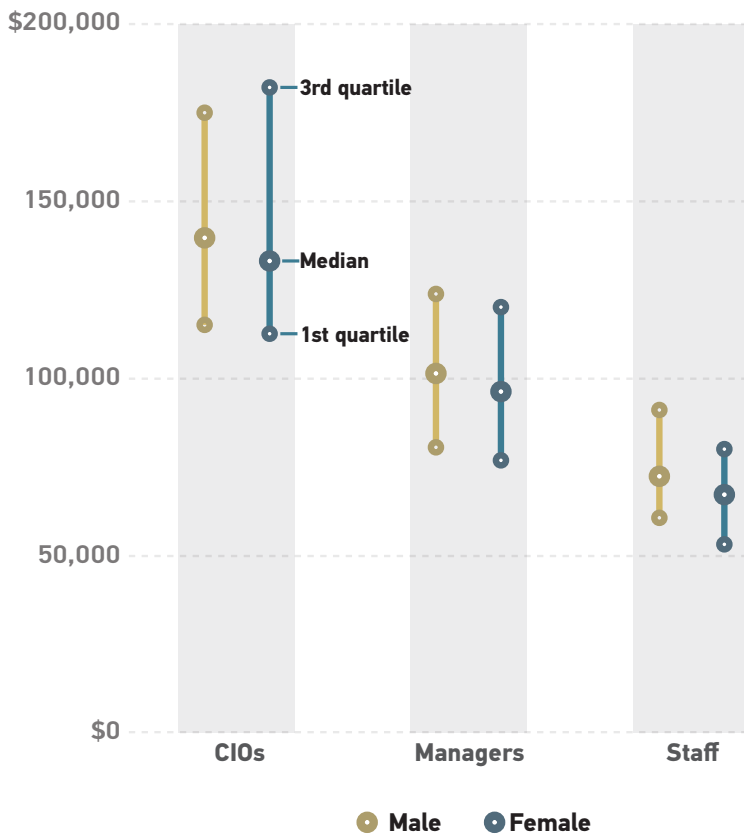
## Key Findings

- **A significant salary gap between men and women persists among IT staff.** There are not statistically significant differences in the salaries of male and female CIOs or managers after controlling for other factors. However, female staff members are paid, on average, \$7,023 less than their male counterparts.
- **Education level, age, and institution type are significantly correlated with salary.** IT professionals who hold master's and PhDs can expect to earn significantly more than those with bachelor's and associate's degrees; older employees with more experience tend to earn more than younger employees with less experience; IT professionals who are employed at doctoral institutions—and especially at private doctorals—earn significantly more than those at other types of institutions.
- **With greater responsibility come greater salaries.** The more direct reports managers have, the more they earn. And CIOs who hold a cabinet position at their institution earn about \$30,000 more per year than their counterparts who do not have “a seat at the table.”
- **Some higher education IT sectors pay better than others.** Higher education IT professionals who hold positions in data, analytics, and business intelligence; information security and services; research computing/cyberinfrastructure; and executive leadership have higher salaries. Those in academic computing/instructional technology; design, media, and web; and desktop services or client support have lower salaries.
- **Institution type, cabinet membership, and years of experience in higher education prior to one's current institution are the only factors among those we considered that predict CIO salaries significantly.** CIOs at doctoral institutions earn the most; AA/BA institution CIOs earn the least. Controlling for other factors, cabinet-level CIOs earn about \$30,000 more than those who do not hold cabinet posts. For each year of prior experience in higher education at another institution, CIOs earn about \$1,200 more.
- **The three strongest predictors of IT managers' salaries are institution type, the sector of one's position, and years of experience in higher education prior to joining one's current institution.** Managers at DR institutions earn more than their AA, BA, and MA counterparts. Managers from IT executive leadership, information security and services, and research computing/cyberinfrastructure earn more than peers in other IT sectors. And each additional year of higher education experience at other institutions is worth about \$800 in additional salary.

- **IT staff salaries are significantly predicted by gender, generation, institution type, education level, IT sector, and experience in higher education prior to joining one's current institution.** Even after controlling for other factors, the observed gender gap persists among IT staff, with male IT staff earning about \$7,000 more than their female peers.

## The Pieces of the Puzzle: Salary Predictors

What impact do demographic factors have on salary?<sup>3</sup> We find evidence that suggests gender inequity is no longer an issue for CIOs and managers at the univariate level. There is no statistically significant difference between the average salaries earned by male (\$150,053) and female (\$150,753) CIOs, nor is there one between average male (\$106,548) and female (\$102,203) IT manager salaries (figure 1). Unfortunately, we find that a salary gap persists between male (\$77,177) and female (\$69,001) staff members. However, there is no single higher education IT sector that is contributing to the overall imbalance between male and female staff members, and we found no statistically significant differences in salary between any of the ethnicities on which we gathered data (Black, White, Hispanic, Asian, or Other/Multiple).



**Figure 1. Median salaries, by gender**

We did find, however, that education level is significantly and positively associated with salary. Higher education IT professionals who have earned a PhD or other terminal degree (\$118,883) earn significantly more than those who hold master’s (\$102,312), bachelor’s (\$92,491), associate’s (\$70,435), or other (\$79,255) degrees.<sup>4</sup>

**Not Too Cool for School**

Average salaries of IT employees, by education level:

- PhD or other terminal degree: \$118,883
- Master’s: \$102,312
- Bachelor’s: \$92,491
- Associate’s: \$70,435
- Other degree: \$79,255

Our analysis also supports the general hypothesis that older employees earn more. We found significant differences in average salaries across the three generations of employees we studied: Baby Boomers (\$112,070) earn significantly more than either Gen Xers (\$97,444) or Millennials (\$70,503). Of course, simply being older does not automatically translate into minting more coin; age, rather, is a proxy for experience, although not necessarily a direct one. We find that years in higher education is significantly but weakly correlated with salary, but that salary is not significantly predicted by years at one's current institution or years in one's current position.

In terms of institutional characteristics, salaries of higher education IT employees at most institution types are not significantly different from one another. Doctoral institutions are the one exception, where the average salary (\$115,644 at private doctorals, \$98,833 at public doctorals) is significantly higher than at other institution types (\$92,130).

Two other factors need to be considered for those with managerial responsibilities beyond those of IT staff. First, our data suggest that the number of direct reports an individual has translates into greater responsibilities and that greater responsibility translates into higher salary levels. Since both CIOs and managers have direct reports, we explored the relationship between the number of direct reports and salary and found that there is, in fact, a significant and positive correlation—that is, we would expect that the more direct reports one has, the larger the salary.

The other variable of consideration is for CIOs only. Given the variation in organizational structures across colleges and universities, some CIOs hold a seat on their president's or chancellor's cabinet while others do not. CIOs who hold a cabinet post at their institution (\$163,708) earn more than those who do not (\$139,675). Higher percentages of CIOs on a president's or a chancellor's board engage more in strategic activities—for example, discussing the IT implications of institutional decisions with senior leadership, and shaping or influencing institutional administrative and strategic decisions. The extra responsibilities and greater influence that accompany board membership do, in fact, translate into higher salaries.

Finally, we examined manager and staff positions by IT sector with the notion that different higher education IT sectors would require different skills, levels of education, and experience, and that demand would vary. The results are somewhat complicated, as we identified and asked about 11 higher education IT sectors in our survey; nevertheless, some trends emerged from the bivariate comparisons. In general, higher education IT managers who hold positions in data, analytics, and business intelligence; information security and services; research computing/cyberinfrastructure; and executive leadership have higher salaries. Managers in academic computing/instructional technology; design, media, and web; and desktop services and client support have lower salaries.

## Talkin' 'bout My Generation!

Average salaries of IT employees, based on generation:

- Baby Boomers: \$112,070
- Gen Xers: \$97,444
- Millennials: \$70,503

## Get on Board!

Average salaries of CIOs by cabinet appointment:

- CIOs with cabinet posts: \$163,708
- CIOs without cabinet posts: \$139,675

These bivariate analyses are built on the initial salary research we conducted in 2016. Once again, we found that several of the original demographic and situational factors continue to predict salary, and we identified some new variables that are significantly correlated with recent salary data.<sup>5</sup> However, each of these discrete relationships tells only part of the story, since bivariate summaries allow each individual predictor to be vetted on a superficial level. To really understand the relationship of these factors to salary, we need to consider their *collective* and *simultaneous* impact on salary determination. By including each of these factors in salary models respective of organizational levels, we garner a sense of how important and viable each factor is when accounting for the other factors.



## Putting the Pieces Together: Salary Models

The real magic happens when we combine these variables into separate models for CIOs, managers, and staff. When we do this, some factors that seem to be associated with salary at the bivariate level are no longer significant predictors after controlling for the others. And the effect of some variables that may have been weakly or unassociated may only pop out when considered in the multivariable environment. On the basis of precedent, we began by creating three separate models, one for each of the organizational-level categories: CIOs, managers, and staff. Our general approach to selecting an appropriate multiple regression model was to first build a full model containing all potential predictors of salary and then reduce that model to obtain more precise estimates of the relationships between salary and the significant predictors (table 1).<sup>6</sup> In the following sections, we unpack each of the respective models, providing a more detailed explanation and analysis of the multivariable models for CIOs, managers, and staff.

**Table 1. Factors tested in multivariable salary models**

Category	Factor	CIO	Manager	Staff
Individual demographics	Gender	✗	✗	✓***
	Generation	✗	✓**	✓****
	Ethnicity	✗	✗	✗
Individual career path	Education level (highest achieved)	✗	✓**	✓**
	Years in current position at current institution	✗	✗	✗
	Extra years at current institution in different position(s)	✗	✓**	✗
	Extra years in higher education at different institution(s)	✓***	✓***	✓*
Characteristics of the current position	Cabinet membership (CIOs only)	✓****	N/A	N/A
	Number of direct reports in current position	✗	✓**	N/A
	IT sector (managers and staff only)	N/A	✓****	✓****
Characteristics of the current institution	Institution type	✓****	✓****	✓****
✓ indicates the factor has a significant association with salary ✗ indicates no significant association was found * $p < .05$ ** $p < .01$ *** $p < .001$ **** $p < .0001$				

## The CIOs

CIOs have one of the most complicated jobs in higher education IT, but predicting what a CIO earns is remarkably simple. Only three of the factors in our model predict CIO salaries significantly: institution type, cabinet membership, and years of experience in higher education prior to one’s current institution. That is, after controlling for all of the other factors we considered, only these three significantly predict CIO salaries. As may be expected, CIOs at certain types of institutions—and particularly doctorals—earn more than those at other types. An average CIO at a doctoral institution is estimated to earn \$63,608 more than a similar CIO at an AA institution. The increased influence that accompanies a seat on the president’s or chancellor’s cabinet is associated with a salary increase of \$30,138. Previous ECAR workforce research found that one must often change institutions to obtain the coveted CIO position.<sup>7</sup> Additionally, we find that the number of years of experience at previous institutions is associated with higher salaries once in a CIO position. We estimate that each additional year of experience is associated with a higher salary in the amount of \$1,182 upon moving into a CIO position at a different institution. Figure 2 shows estimated average salaries for CIOs.

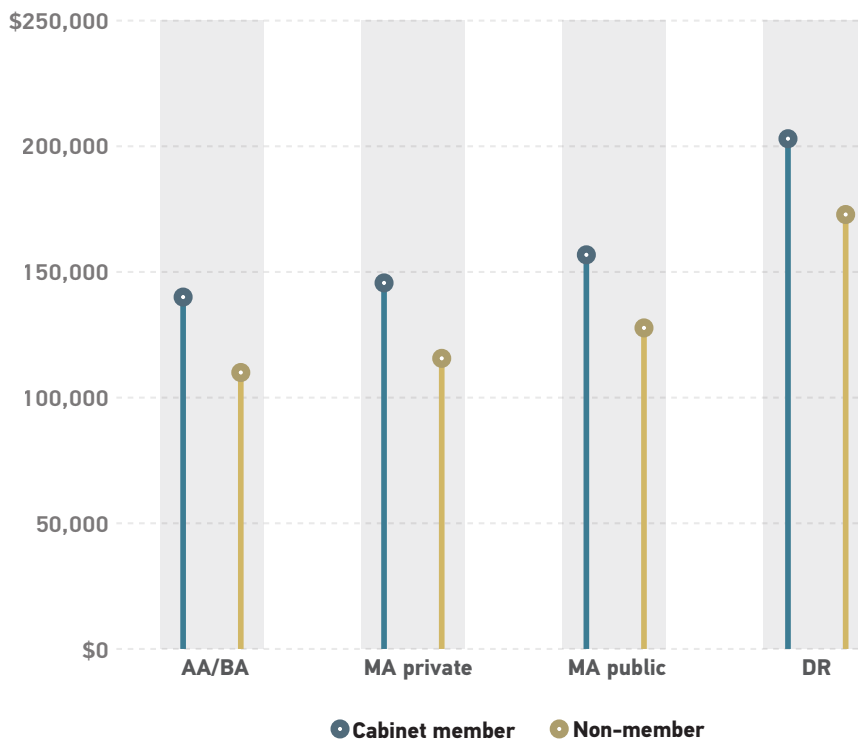
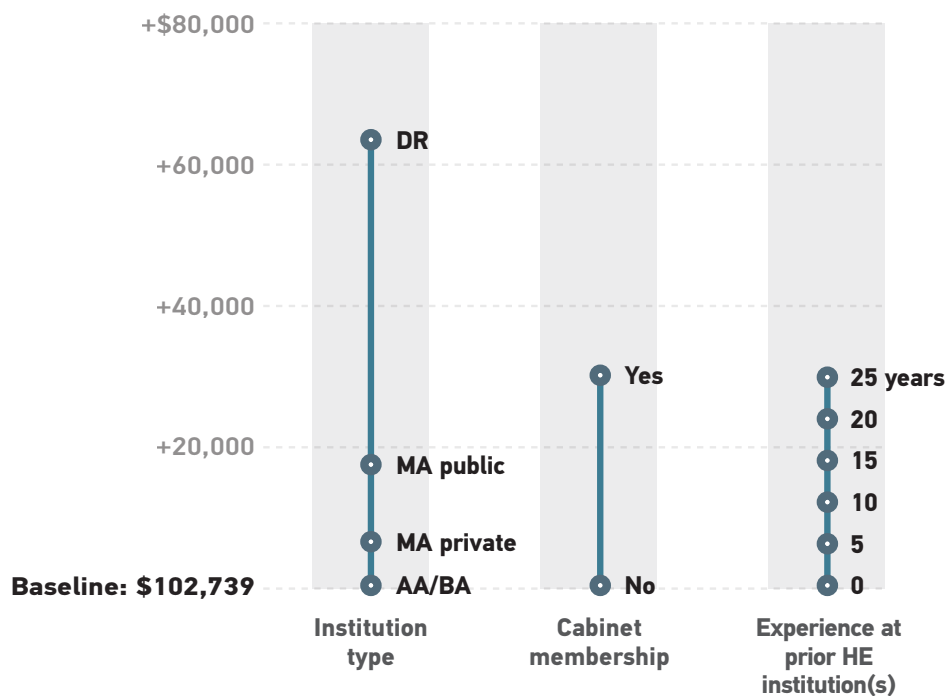


Figure 2. Estimated average salaries for CIOs<sup>8</sup>

Though institution type, cabinet membership, and years of experience at prior institutions are strongly associated with CIO salaries (figure 3), this model accounts for only 34% of observed variability in CIO salaries. That is, two-thirds of the variation in CIO salary remains unexplained. The uncertainty in predictions resulting from this model suggests that there are factors beyond those captured in this survey that affect CIO salaries. While some of those factors may be random, unmeasurable, and/or unknowable, we can speculate about the ones that might improve our ability to predict CIO salaries. For example, we know that political and critical-thinking skills, relationship-building and collaborative skills, business skills, and other skills are deemed important.<sup>9</sup> Understanding the variations in CIOs’ possession of these skills might improve our modeling of how CIO salaries are determined. In the meantime, we recommend that CIOs who want to improve their salary consider (1) seeking a position with an institution that has the capacity to pay its CIO more, (2) seeking a position with an institution at which the CIO is a cabinet-level position, and/or (3) advocating that one’s current responsibilities include a position on the president’s or the chancellor’s cabinet.



**Figure 3. Relative size of the effects of significant factors on CIOs’ average salaries**

## The Managers

The picture of managerial salaries is more complex than for CIOs, involving seven significant predictors. The three strongest predictors of IT managers' salaries are institution type, the sector of one's position, and years of experience in higher education prior to joining one's current institution. Institution type is consistently a strong predictor across organizational levels (figure 4), with those at more complex institutions expected to earn a higher salary, on average. Managers at AA, BA, and MA institutions tend to earn similar amounts, while managers at private doctorals are the clear standouts, earning \$28,907 more than their AA/BA/MA counterparts. Managers at public doctorals earn, on average, \$11,895 more than those at AA/BA/MA institutions.

**IT Sector:** Academic computing/instructional technology; design, media, and web; desktop services or client support; IT operations and service delivery; other

	AA/BA/MA	DR public	DR private
Millennials	\$64,714	\$76,609	\$93,621
Gen Xers	\$74,782	\$86,677	\$103,689
Baby Boomers	\$79,912	\$91,807	\$108,820

**IT Sector:** Administrative/enterprise IT; applications development or operations; data, analytics, and business intelligence; networks and systems

	AA/BA/MA	DR public	DR private
Millennials	\$83,137	\$95,032	\$112,044
Gen Xers	\$93,205	\$105,100	\$122,112
Baby Boomers	\$98,335	\$110,231	\$127,243

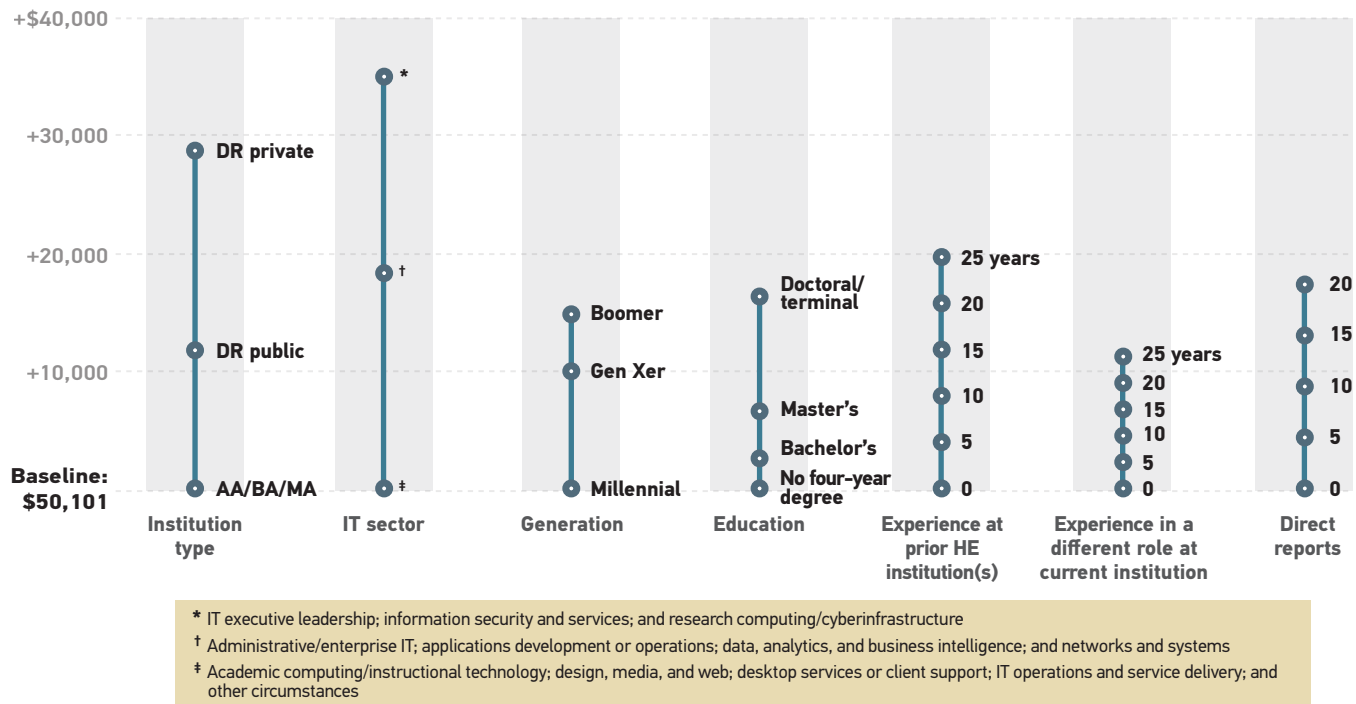
**IT Sector:** IT executive leadership; information security and services; research computing/cyberinfrastructure

	AA/BA/MA	DR public	DR private
Millennials	\$100,403	\$112,299	\$129,311
Gen Xers	\$110,471	\$122,366	\$139,378
Baby Boomers	\$115,602	\$127,497	\$144,509

**Figure 4. Estimated average salaries for IT managers, by institution type, sector, and generation<sup>10</sup>**

It should come as no surprise that a manager on the executive leadership team is expected to earn more than average. We grouped IT positions into 11 sectors plus an “other” category.<sup>11</sup> Our model places managerial salaries into 3 groups comprising these 12 categories. Managers from academic computing/instructional technology; design, media, and web; desktop services or client support; IT operations and service delivery; and other circumstances earn salaries at a similar level, depending on institution type. Managers from administrative/enterprise IT; applications development or operations; data, analytics, and business intelligence; and networks and systems are expected to earn an additional \$18,423 over those in the first group. And managers from IT executive leadership; information security and services; and research computing/cyberinfrastructure earn, on average, an additional \$17,266 above that (or \$35,690 more than those in the lowest-sector group).

Each year of prior experience at another institution is associated with an expected increase in salary of \$799. The additional factors found to associate with managerial salaries are generation, education level, number of direct reports, and years of experience at one’s current institution in a different position. Figure 5 shows the relative effects of these and other factors on managers’ salaries. Each year of experience at one’s current institution prior to obtaining the current managerial position is associated with an expected increase in salary of \$456. The typical (median) manager in our sample has eight years of experience at the current institution prior to obtaining the current position, which would translate to an additional \$3,651 of salary. Even after controlling for years of experience, we find that members of the older generations earn more: compared with Millennials, Gen Xers earn an average of \$10,068 more, and Boomers earn an average of \$15,198 more. These discrepancies might be explained by the additional wisdom and experience that comes with age. Or perhaps these older employees are being rewarded for professional experience they have gained outside higher education IT.



**Figure 5. Relative size of the effects of significant factors on IT managers' average salaries**

The plurality (49%) of IT managers in our sample have a master’s degree as their highest level of education completed. They earn, on average, \$6,550 more than those with no four-year degree, and \$4,019 more than those whose highest degree is a bachelor’s. A doctoral or other terminal degree can be expected to earn a manager an additional \$10,006 above those with a master’s. Last but not least, each additional direct report is associated with an expected increase in salary of \$882. Figure 4 contains estimated average salaries for IT managers. As with the CIO model, only about a third (38%) of the observed variability in managerial salaries is explained by these predictors.

So, based on what we see in our data, what advice can we offer IT managers who would like to improve their earning power? The answer is that it depends on how fast one wants to realize the increase in salary, the amount of effort one wants to put into leveling up their skills and knowledge, and their personal comfort with disrupting their lives. The most expedient approach to securing a higher base salary would be to move to a doctoral institution (assuming that one is not already working at one). However, opportunities to do so might be limited by a host of factors, including geographic proximity to a DR institution, available positions in one’s field, and (if a move is required) the willingness to uproot and disrupt one’s life.

Another possibility might be to consider retraining or developing a skill set in one of the higher-paying higher education IT sectors and make a lateral move. We know that higher education IT employees tend to stay in the same fields, having specialized and cultivated knowledge, skills, and reputations in those spaces. While breaking out of these molds may be difficult and potentially time-consuming, taking advantage of naturally occurring partnerships and interactions that are part of the daily workflow to learn about other sectors and to develop a plan with a mentor to pursue such lines may not just increase salary but may also make one a more likely candidate for securing a CIO position down the road.<sup>12</sup>

Finally, a longer-term option may be to earn another, higher degree. With some institutions offering tuition remission or tuition discounts, earning a master's, doctoral, or other terminal degree in a field related to one's current or aspirational position may take a while longer than the aforementioned options, but education is always a wise investment in oneself.

## The Staff

Predicting staff salaries is a little more complicated, given that the bulk of the higher education IT workforce performs many jobs that vary considerably more than those of CIOs or managers. Yet, despite this complexity, we are able to significantly predict IT staff salaries with six basic factors: gender, generation, institution type, education level, IT sector, and experience in higher education prior to joining one’s current institution. Figure 6 shows estimated average salaries for staff.

<b>Female</b>			
	<b>AA/BA/MA private</b>	<b>MA public/ DR public</b>	<b>DR private</b>
<b>Millennials</b>	<b>\$43,430</b>	<b>\$49,796</b>	<b>\$68,607</b>
<b>Gen Xers</b>	<b>\$53,419</b>	<b>\$59,785</b>	<b>\$78,596</b>
<b>Baby Boomers</b>	<b>\$59,434</b>	<b>\$65,800</b>	<b>\$84,611</b>

<b>Male</b>			
	<b>AA/BA/MA private</b>	<b>MA public/ DR public</b>	<b>DR private</b>
<b>Millennials</b>	<b>\$50,453</b>	<b>\$56,819</b>	<b>\$75,630</b>
<b>Gen Xers</b>	<b>\$60,442</b>	<b>\$66,808</b>	<b>\$85,619</b>
<b>Baby Boomers</b>	<b>\$66,457</b>	<b>\$72,823</b>	<b>\$91,634</b>

**Figure 6. Estimated average salaries for IT staff<sup>13</sup>**

Consistent with the previous models, IT staff who work at doctoral institutions have significantly higher average salary levels compared with other types of institutions. And, like their managerial counterparts, staff at private doctorals earn the most, to the tune of \$25,177 more than their peers at AA, BA, and private master’s institutions. Public master’s staff are on par with those at public doctorals, \$6,366 above the salaries of those at AA, BA, and private MA institutions.

Additional advantages accrue to those in the older generations. Compared with Millennials, Gen Xers earn an additional \$9,990. And the average Boomer is expected to earn another \$6,015 on top of that. At the same time, IT staff see an additional \$349 on average for each year of experience gained in higher education prior to joining their current institution.

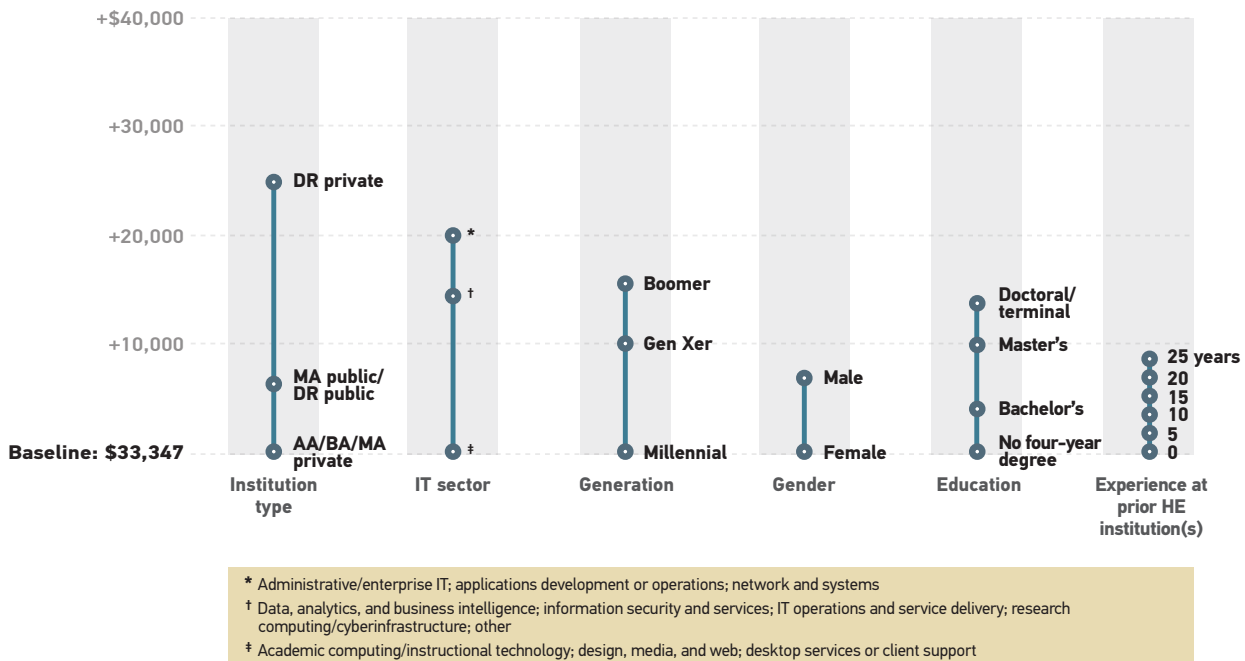
Unfortunately, the salary gender gap is most pronounced among IT staff. In fact, staff is the only group that has a salary imbalance associated with gender and



for which the difference is statistically significant even after adjusting for other factors. Our model predicts that male IT staff will earn an additional \$7,023 on average above the average female IT staff salary after adjusting for other factors.

The plurality (41%) of IT staff surveyed reported that their highest degree is a master’s. Earning a doctoral or other terminal degree is associated with a salary increase of \$4,073 above those with a master’s. A similar difference is seen between those with a bachelor’s and those with a master’s (\$5,712), and again between those with a bachelor’s and those without a four-year degree (\$4,371). In other words, pursuing that next level in your educational path could be the ticket to a salary bump of \$4,000–5,000, not to mention an increased opportunity to move into a managerial position.

As with the managerial model, the 11 IT sectors<sup>14</sup> settle into 3 groups for predicting staff salaries (figure 7). Compared with a baseline of positions within academic computing/instructional technology; design, media, and web; and desktop services or client support, IT staff in data, analytics, and business intelligence; information security and services; IT operations and service delivery; research computing/cyberinfrastructure; and other circumstances earn an average of \$14,655 more. And staff in administrative/enterprise IT, applications development or operations, and network and systems earn an additional \$5,669.



**Figure 7. Relative size of the effects of significant factors on IT staff average salaries**

This model accounts for 36% of the variability observed among IT staff salaries. Clearly there are other factors, some beyond our ability to measure, that affect the salary of an individual IT staff member. Figure 6 contains estimated average salaries for IT staff.

When it comes to higher education IT staff salaries, little can be done about the generational differences or the type of institution at which one works. For the former, generation likely reflects a combination of years of experience and a cumulative effect of annual salary increases that push the average salary upward as one ages. For the latter, it is not reasonable to expect institutions in the lower salary categories to be able to meet the salaries of those blessed with greater resources. However, one could seek employment at institution types that pay more, but such shifts are complicated for individuals and their families, especially if relocation is required to secure a new position. One of the most important things that higher education IT organizations can do is work to close the salary gap between men and women. Our results suggest that there continues to be a systematic pattern in which female staff members are paid significantly lower wages than their male counterparts, even after controlling for other salary predictors. IT organizations should consider auditing their compensation packages by gender to guarantee that equitable salaries are paid for equitable work.

## Conclusion

Higher education IT employees tend to be paid pretty well, but a host of factors contribute to the determination of how well they are paid. Generally speaking, one's age, education level, experience in higher education, the IT sector in which one works, the type of institution at which one works, and organizational position (staff, manager, or CIO) will affect how much someone gets paid. In specific cases, more discrete predictors such as cabinet-level positions for CIOs, number of direct reports for managers, and gender for staff will shape salary. Many of the factors we identify are actionable (one can change institutions, positions, sectors, organizational levels, education levels) and afford agency to the higher education IT employee; other demographic characteristics are somewhat more fixed and difficult to address. For example, generational differences in salary persist for managers and staff but are less likely due to systematic discrimination against Gen Xers and Millennials than to some aspect of experience and wisdom that come with age. However, if evidence indicated that Millennial staff were systematically paid less because of their age, then we would recommend a corrective similar to the one we suggest for guaranteeing equal pay for equal work between men and women. Certainly, a lot more research can and should be done to explain the variability in salary for which our research does not account. But, given what we know about higher education IT workforce salaries, we are confident in the recommendations we offer to employees who want to maximize compensation.

## Recommendations

- **Higher education IT departments need to perform a systematic and thorough audit of staff salaries to correct for gender-based wage imbalances.** Work closely with HR to determine the best approach for rendering salary adjustments to equalize pay for men and women performing the same roles. Furthermore, take steps to guarantee that equitable salaries are established at the point of hire, as lower starting salaries may result in a lifetime of lower compensation rates and retirement benefits. Establishing equitable compensation packages may generate longer-term benefits such as boosted employee morale and increased retention by signaling to the workforce the organization's commitment to diversity, equity, and inclusion (DEI).
- **CIOs who want to improve their salary may need to consider leaving their current institution.** Since the significant determinants of CIO salary are few and the CIO position resides at the top of the IT organization chart, the options for bringing home more bacon are limited—finding a new position at another institution, perhaps one that has established the CIO as a cabinet-level position, might be the best option for many. A CIO could also lobby to have one's current position approved for a seat on the president's or the chancellor's cabinet (and request a commensurate bump in pay).
- **Managers who seek to increase their salaries should consider finding a position at a doctoral institution, take steps to develop the requisite skills and knowledge to move into a more lucrative IT sector, or earn a degree beyond their current level of education.** The paths managers choose to increase their earning power are highly individualized, depend on one's threshold of tolerance for disrupting family life (e.g., moving away for a job at another institution), and/or require patience in realizing a higher salary (e.g., earning a PhD over the course of several years).
- **To increase their salaries, IT staff should consider developing a skill and knowledge set that would allow them to move to an IT sector that pays better than their current one, earn a degree higher than their current one, or move to another institution.** A strategy that incorporates several of these efforts may help chart a career path that not only leads to salary increases as a staff member but also allows one to move up the pecking order of IT organizations. For example, completing coursework toward a degree may increase opportunities to switch IT sectors, which may in turn lead to management or executive opportunities at one's current or another institution.

## **Methodology**

Survey invitations were sent to 40,317 IT professionals in the EDUCAUSE database. A total of 1,592 respondents provided data that could be used for analysis, resulting in a response rate of 4%. Respondents were from all 50 US states (plus the District of Columbia, Puerto Rico, and Guam) and from 35 countries outside the United States; 815 institutions of higher education were represented. Non-US respondents made up 10% of the sample. Data collection took place in April and May of 2018.

## **Acknowledgments**

The authors would like to acknowledge the contributions of other members of the EDUCAUSE research team to this report: Dana C. Gierdowski and Joseph D. Galanek offered their research expertise and constructive feedback on previous drafts, and Kate Roesch developed the graphics and figures for the report. Additionally, we would like to thank our EDUCAUSE colleagues Gregory Dobbin for his careful review, copyedit, and layout of this report and Lisa Gesner for developing the marketing strategy behind its release. Mark McCormack and Susan Grajek offered constructive feedback, vision, and leadership on the workforce research projects.

## Notes

1. According to the US Bureau of Labor Statistics, the median salary of computer and information technology occupations was \$86,320 in May 2018.
2. D. Christopher Brooks and Pam Arroya, Higher Education IT Salary Report, 2016, research report (Louisville, CO: ECAR, October 2016).
3. We first explore the bivariate relationships between these factors and salary at each organizational level. While these are valuable for understanding the impact of certain factors one at a time, they are limited, as the impact of one variable can mask the impact of others. To overcome these limitations, we use a multiple regression model in the second half of the report to adjust for the impact of our independent factors on salary simultaneously. This can have the effect of amplifying certain relationships and muting others. The model selection method we use in this report results in reduced theoretical models in a similar fashion to those developed in the 2016 report.
4. “Other” is defined as vocational or occupational school certificate, high school diploma or equivalent, or other degree/credential.
5. Brooks and Arroya, Higher Education IT Salary Report, 2016.
6. Statistical testing of this full model allows us to identify and remove factors that do not have a significant association with salary in the presence of the other ones. The simplified, reduced model then gives more accurate estimates of the relationship between salary and each significant predictor, controlling for the effects of the other significant predictors. Especially in cases of marginal statistical significance, further combinations of predictors were explored, including adding predictors back to the reduced model to reevaluate their potential contribution in the absence of other nonsignificant predictors. Here the art of quantitative research meets its science. Finding consistency in statistical conclusions among these additional models lends additional confidence to the appropriateness of the predictors included and excluded in each of the final models.
7. Joseph D. Galanek, Dana C. Gierdowski, and D. Christopher Brooks, The Higher Education IT Workforce Landscape, 2019, research report (Louisville, CO: ECAR, February 2019): 31.
8. Estimated average salaries represent a CIO with six years of prior experience in higher education at another institution (add/subtract \$1,182 for each year).
9. Jeffrey Pomerantz, IT Leadership in Higher Education, 2016: The Chief Information Officer, research report (Louisville, CO: ECAR, March 2017).
10. Estimated average salaries represent an IT manager with a master’s degree (subtract \$6,550 for no four-year degree; subtract \$4,019 for bachelor’s; add \$10,006 for doctoral/other terminal degree), 5 direct reports (add/subtract \$882 each), 8 years of experience in a different position at their current institution (add/subtract \$456 per year), and 0 years of experience at another higher education institution prior to their current institution (add \$799 per year).
11. In addition to the general “other circumstances” category, the 11 named higher education IT sectors that we identified and on which we collected data are as follows: IT executive leadership; academic computing/instructional technology; administrative/enterprise IT; applications development or operations; data, analytics, and business intelligence; design, media, and web; desktop services or client support; information security and services; IT operations and service delivery; networks and systems; and research computing/cyberinfrastructure.
12. See Career Paths: Higher Education CIOs.

13. Estimated average salaries represent an IT staff member with a master's degree (subtract \$10,083 for no four-year degree; subtract \$5,712 for bachelor's; add \$4,073 for doctoral/other terminal degree) in academic computing/instructional technology; design, media, and web; desktop services or client support (add \$14,655 for data, analytics, and business intelligence; information security and services; IT operations and service delivery; research computing/cyberinfrastructure; and other circumstances, or add \$20,324 for administrative/enterprise IT; applications development or operations; and network and systems) and 0 years of experience at another higher education institution prior to their current institution (add \$349 per year).
14. We excluded the executive leadership sector for our analysis of staff salaries.