Communications of the Association for Information Systems

Volume 55 Paper 25

11-12-2024

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Recommended Citation
Richardson, B., Kettles, D., Mazzola, D., & Li, H. (2024). Career Trajectory Analysis of Fortune 500 CIOs: A LinkedIn Perspective. Communications of the Association for Information Systems, 55, 654-679.
https://doi.org/10.17705/1CAIS.05525

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Cover Page Footnote

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Communications of the Association for Information Systems

IS for Practitioners Article DOI: 10.17705/1CAIS.05525 ISSN: 1529-3181

Career Trajectory Analysis of Fortune 500 CIOs: A LinkedIn Perspective

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Abstract:

The Chief Information Officer (CIO) plays a pivotal role in shaping the technological strategy and overall success of modern corporations, working in close collaboration with other C-suite executives such as the CEO and CFO. This study offers an analysis of the defining characteristics of Fortune 500 CIOs and compares them to their executive peers. Using an inductive methodology, we examine the career trajectories of 2,821 Fortune 500 executives, including 400 CIOs, through LinkedIn data and leverage interviews with six Fortune 500 CIOs to contextualize the findings. The results highlight several distinct patterns: aspiring CIOs tend to be more racially diverse, work across a greater number of companies, hold more positions over their careers, and take longer to reach executive roles compared to other C-suite members. Through predictive modeling, we identify that CIOs can reduce the time it takes to reach top CIO positions by seeking out internal promotion opportunities at those same companies. This paper concludes with actionable recommendations for aspiring CIOs and outlines how these insights inform both practice and future research on IT leadership.

Keywords: CIO, IT Leadership, Fortune 500, LinkedIn, Career Progression, Mixed Methods.

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1 Introduction

The highest level of corporate leadership, often referred to as the "C-suite," encompasses the top executive positions within a company. These include positions such as the Chief Executive Officer (CEO), Chief Financial Officer (CFO), and Chief Information Officer (CIO), each carrying distinct and significant responsibilities. The effectiveness of individuals in these positions is crucial for organizational success, as effective leadership is directly linked to firm performance (Smith et al., 1984).

The CIO role is uniquely influential in enhancing firm performance. CIOs are primarily responsible for managing firm IT resources (Banker et al., 2022; Noonpakdee et al., 2020), a critical function as IT has become a predominant driver of innovation in most organizations (Sambamurthy et al., 2003). Furthermore, decisions made by CIOs significantly impact key organizational outcomes including profitability (Taylor & Vithayathil, 2018), innovation (Watts & Henderson, 2006), and employee satisfaction (Engelen et al., 2022). Such influence stems from the ever-expanding role of CIOs, who are no longer solely focused on the efficient management of IT infrastructure, but also play a strategic role as executive-level managers involved in long-term organizational planning (Carter et al., 2011; Chun & Mooney, 2009; Kratzer et al., 2023).

Many CIOs and other executives aspire to career success by securing positions at top organizations known for their extensive impact and high profitability. Fortune magazine's annual "Fortune 500" list ranks the 500 largest public and private US companies by revenue, featuring prominent organizations such as Walmart, Amazon, and Apple (Fortune, n.d.). Executives in the C-suite of these companies represent the pinnacle of their respective disciplines, having navigated diverse career paths to reach these prestigious roles. The unique role of the CIO within powerful organizations, such as those in the Fortune 500, raises important questions about how these executives ascend to their positions and how their career paths differ from those of other top executives. Understanding these pathways can provide insight into the skills and experiences necessary to attain such influential roles. While CIOs and other chief officers share some similarities in their paths to reaching the Fortune 500 (Jones et al., 2020), the career trajectories of CIOs are notably distinct due to the technical nature of their responsibilities (Anderson & Ball, 2015; Leidner & Mackay, 2007).

One study by Mazzola et al. (2017) examined the career paths of CIOs, offering valuable insights, but with several limitations including a small sample size of 50 CIOs and an exclusive reliance on descriptive statistics. To further contribute to the knowledge space on the career paths of CIOs, we leveraged a more comprehensive sample of 2,821 chief officers from Fortune 500 organizations, using data from the popular networking site LinkedIn. This sample represents an estimated 60% of the Fortune 500 executive population. We then conducted an exploratory, inductive analysis of this data and identified 14 career path distinctions of CIOs compared to other C-level executives. To complement this descriptive analysis, we conducted in-depth interviews with six Fortune 500 CIOs—four current and two former—from various industries. These qualitative insights enriched the quantitative findings derived from the LinkedIn dataset. The results of these combined analyses, including interview transcripts are published in *MIS Quarterly Executive* (Kettles et al., 2024).

Building on that work, the goal of this paper is to: 1) identify additional descriptive findings that highlight the statistically significant distinctions between CIOs and other top executives; 2) employ predictive modeling to identify strategies for reducing the time prospective CIOs spend advancing to the C-suite; and 3) provide actionable insights for aspiring CIOs, practitioners, and researchers. By achieving these objectives, this research not only fills gaps in knowledge about the specific paths CIOs take to reach executive roles but also offers practical recommendations for accelerating career advancement in a field that is increasingly critical to organizational success. This study thus informs both individual career strategies and organizational development practices, offering data-driven insights into how aspiring CIOs can better navigate the complex landscape of IT leadership.

This paper begins by outlining the data collection process used for both the descriptive and inferential analyses. We then explore the three essential components of a career roadmap for aspiring Fortune 500 CIOs—education, work experience, and the timeline to the top. We empirically identify the characteristics of top executives, including CIOs, that either accelerate or delay their advancement. The paper concludes by outlining strategies for aspiring CIOs, addressing ethical considerations related to using LinkedIn as a data source and proposing directions for future research.

2 Executive Data

The data for this study is derived from public profiles on LinkedIn, the largest professional social network with over 900 million members from 200 countries (McCain, 2023). A 2022 survey reports that 97% of the 352 Fortune 500 CEOs on social media are active on LinkedIn (McIvor, 2022). While not entirely comprehensive of all executives, given these statistics, we consider LinkedIn a sufficiently reliable source for career data on executives in the Fortune 500. The structured LinkedIn profiles generally include information on employment history, education, geographic location, and positions over time. While using LinkedIn as a data source may raise concerns about response bias, such as individuals exaggerating or falsifying their employment histories, the public nature of LinkedIn helps mitigate this issue. The platform's implicit peer monitoring deters dishonesty, as misleading information can be easily scrutinized by one's network. A 2012 study supports this: "Websites such as LinkedIn, which make resume information public and connected to one's network, can encourage greater honesty for resume claims that are most important to employers" (Guillory & Hancock, 2012). Furthermore, because our study population consists of Fortune 500 executives, who are often subject to public scrutiny, we expect the falsification of self-reported data on LinkedIn to be minimal.

This study underwent a systematic data gathering process. First, we identified all organizations listed in the Fortune 500 and visited each organization's website to identify the names and positions of executives within the C-suite. Executives in non-standard positions were excluded to maintain consistency. The C-level executive positions and associated acronyms are detailed in Table 1. Second, we conducted searches for each executive on LinkedIn and scraped the publicly facing profiles. Data collection occurred in 2021, providing a cross-sectional snapshot of the career status of Fortune 500 executives at that time. Executives without LinkedIn profiles, or with profiles lacking sufficient information, were excluded from the final sample. This resulted in a total of 2,821 unique executive profiles, representing an estimated 60% of the Fortune 500 executive population. Each of the nine executive positions had at least 196 profiles, with an average of 313 profiles per position, including 400 CIOs.

Table 1. Profile Availability by Executive Title

Title	Number of Executives	% out of 500
CAO (Chief Accounting Officer)	247	49%
CEO (Chief Executive Officer)	332	66%
CFO (Chief Financial Officer)	388	78%
CHRO (Chief Human Resources Officer)	360	72%
CIO (Chief Information Officer)	400	80%
CISO (Chief Information Security Officer)	248	50%
CLO (Chief Legal Officer)	369	74%
CMO (Chief Marketing Officer)	281	56%
COO (Chief Operating Officer)	196	39%

We also conducted interviews with six Fortune 500 CIOs from different industries and with varying degrees of experience. The interviews were designed to obtain practical and context-informed insight into the patterns identified in the LinkedIn data. Table 2 lists the CIOs interviewed and the pseudonyms used to refer to them in this paper. For a complete transcript of the interviews and additional commentary not included in this paper see Kettles et al., 2024.

Table 2. Characteristics of the Fortune 500 CIOs Interviewed

CIO Identifier	Fortune 500 Industry	Current of Former CIO
Lodging CIO	Lodging	Current
Electronics CIO	Electronic components	Current
Managed Solutions CIO	Office technology solutions	Current
Retail Pharmaceutical CIO	Healthcare and retail pharmaceuticals	Current
Information Technology CIO	IT hardware and software	Former
Convenience Retailing CIO	Convenience retailing	Former

2.1 Ethical Considerations of Using LinkedIn Data

This study adheres to ethical research guidelines to ensure the privacy and confidentiality of participants. For the interview portion of the study, we obtained Institutional Review Board (IRB) approval. The public data collection from LinkedIn did not require IRB approval, as it was based on publicly accessible profiles, and the data were generalized to report on employment trends rather than individual-level information. The trends reported, such as the percentage of executives holding MBAs, are aggregated and benign, making it difficult to link findings to any particular individual. Although LinkedIn profiles are publicly accessible, we recognize the importance of protecting personal information. To that end, all collected data is stored in secure, encrypted repositories, and individual profiles are anonymized to prevent the identification of specific persons. No sensitive data is shared publicly, and care is taken to ensure that all findings are reported at a general level. Moreover, we strictly adhere to platform policies, ensuring that the data is collected and handled with integrity.

3 Demographic Characteristics

3.1 Gender and Ethnicity Identification Methodology

This study commences with an examination of the fundamental demographic characteristics of Fortune 500 CIOs in comparison to other C-suite executives. Given that LinkedIn does not explicitly provide demographic identifiers like gender or ethnicity, these variables were manually coded for analysis. This was achieved by downloading publicly available profile pictures from each executive's LinkedIn profile and crowdsourcing the identification of their gender and ethnicity. Surveys were distributed to students at a major public university in the Southwest United States. Each student was assigned a randomly selected set of executive profiles to review, ensuring comprehensive and diverse coding of the images. The reliability of this coding was assessed using the Percent Agreement Index (PAI), which measures the degree of agreement among raters. Profiles with a PAI below 0.8 were excluded from the demographic analysis but were retained for subsequent analyses. On average, each executive profile image was coded by approximately 19 students. For gender coding, the inter-rater reliability, measured by Krippendorff's alpha, was exceptionally high at 0.9681, indicating significant robustness. Ethnicity classifications initially used six distinct racial categories, resulting in a Krippendorff's alpha of 0.6553, indicating a moderate level of agreement. Due to this moderate reliability and the relatively low representation of non-white categories, we simplified the classification to a binary white/non-white variable to improve the clarity and reliability in the reporting of data.

3.2 Demographic Results

Figures 1 and 2 illustrate the gender and ethnicity composition of Fortune 500 executives, respectively. The data reveal a predominant presence of white males among these executives, providing evidence of the ongoing challenges in achieving representative diversity at the highest levels of corporate leadership across practically all disciplines.

Concerning gender distribution, only the position of CHRO is primarily occupied by women, with a representation of 68%. In stark contrast, other executive roles are predominantly male, with an average female representation of about 29%. Notably, the role of CIO features lower female representation at 21%. A Tukey multiple comparisons of means test confirms that female representation among CIOs is significantly greater than that of CEOs (-0.12, $p < .05$), and lower than that of CLOs (.19, $p < .001$), CMOs (0.24, $p < .001$), and CHROs (0.47, $p < .001$). This pattern reflects the broader trend of male dominance in the technology sector, as documented in existing literature (Alfrey & Twine, 2017; Michie & Nelson, 2006; Von Hellens et al., 2003) and even broadly among executives in Fortune 500 firms (Brady et al., 2011).

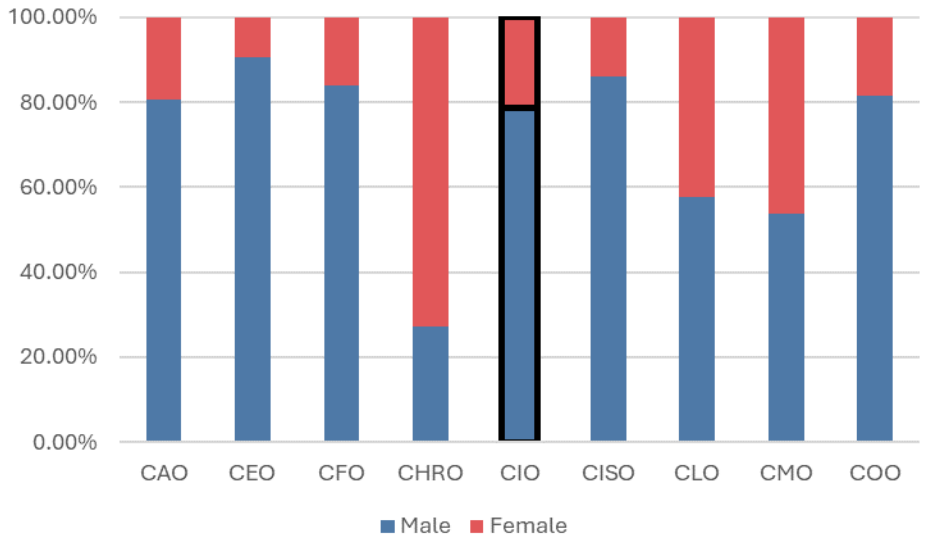

Figure 1. Gender Distribution Among Fortune 500 C-Suite Executives

Regarding ethnic diversity, white individuals hold most C-level positions. Among the various executive roles, CIOs exhibit the highest level of diversity with approximately 25% non-white representation, surpassing the overall average of 16%. A Tukey multiple comparisons of means test provides evidence that non-white representation among CIOs is statistically greater than CAOs, CEOs, and CFOs ($p < .05$), while all other executives are statistically comparable. This suggests that CIO positions may be more inclusive compared to other executive roles. Nonetheless, as indicated by previous research, non-white tech workers still face significantly greater barriers to IT advancement than their white counterparts (McGee, 2018).

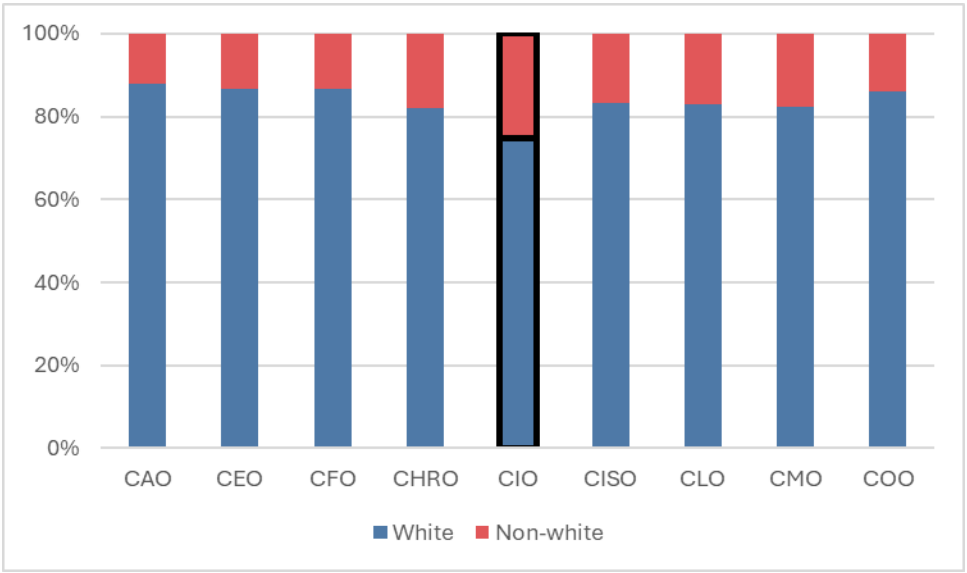

Figure 2. Ethnicity Distribution Among Fortune 500 C-Suite Executives

4 Educational Background

A strong educational background consistently defines the majority of Fortune 500 executives. Among the 1,835 profiles with complete educational histories, 73% hold advanced degrees, amounting to 955 master's degrees and 381 PhDs or JDs. When comparing the educational qualifications of CIOs to other C-suite executives, notable differences emerge in the frequency and perceived value of specific degrees,

as well as the prominence of elite institutions. These distinctions emphasize divergent educational patterns and career paths for CIOs, pointing to a distinctive route to leadership within the field.

4.1 The Degrees CIOs Earn

4.1.1 Undergraduate Degrees

Although the CIO role is predominantly business-oriented, distinct from the technical roles often preceding it, our analysis offers nuanced insights into the educational backgrounds shaping this perception. The educational profiles of Fortune 500 executives span a diverse range of disciplines, broadly divided into business and non-business fields. Business domains include finance, accounting, business management, operations, supply chain management, and information systems, while non-business fields encompass mathematics, psychology, engineering, and the humanities.

Our findings reveal no significant differences in undergraduate majors across these executives, with an equal distribution of bachelor's degrees between business and non-business disciplines (see Table 3). However, CIOs diverge from this pattern, with approximately 70% holding undergraduate degrees in non-business fields. Among CIOs with business degrees, the most common majors are management information systems, accounting, and finance. Thus, a business-focused undergraduate education appears to be less crucial for CIOs compared to other executives.

We also find that 54% of future CIOs in our sample hold at least one technical degree, compared to just 14% of other executives. A t-test confirms the statistical significance of this difference ($t = 15.10$, $p < .001$). We define technical degrees as those in information systems, computer science, or engineering. This result contrasts slightly with previous studies. One study reported that 38% of CIOs had degrees in business topics and 34% had degrees in technical disciplines (Anderson & Ball, 2015). Another study found that 24% of CIOs earned a degree in business and 44% in information systems or computer science (Mazzola et al., 2017).

When asked about the trend of CIOs often holding first degrees unrelated to business, the Electronics CIO stated that a bachelor's degree aligned with their C-suite area of expertise is typically only necessary for CAOs, CFOs, and CMOs. Several CIOs emphasized that the specific field of the first degree is less important than its rigor and the breadth of education it offers.

Table 3. First and Last Degree as Business or Nonbusiness

Chief Officer	Degree Type	First Degree	Highest Degree
All	Business	55.5%	74.6%
	Nonbusiness	44.5%	25.4%
CIO	Business	29.3%	45.6%
	Nonbusiness	70.7%	54.4%

4.1.2 Graduate Degrees

The data also suggest that for CIOs, having a graduate degree may be less important than for other C-suite roles. A substantial proportion of Fortune 500 CEOs (68%) and CFOs (61%) in our sample report obtaining graduate degrees, yet only about half of the CIOs report earning a graduate degree. Some of the interviewed CIOs were surprised that the number was as low as 50%. However, the Convenience Retailing CIO reasoned that the changing business landscape has led to more individuals being appointed to CIO positions without advanced degrees. This CIO noted that while a higher-level degree is beneficial, it is not a necessity. Several other interviewees echoed this sentiment, suggesting that a master's degree often reflects a motivated individual with the drive to achieve goals and rise through the corporate ranks to become a CIO. Therefore, a master's degree can be an early indicator of an individual's ambition and determination.

Among executives who pursue graduate education, approximately 75% select programs in business-related disciplines. However, this trend shifts when considering CIOs, as only about 46% opt for business-focused graduate programs (see Table 3). This calls attention to a distinct educational preference among CIOs. While a business-oriented degree is not essential for a CIO's career, it can offer significant advantages. A higher proportion of CIOs pursue business-related disciplines at the graduate level compared to their undergraduate education (46% vs. 29%). This trend suggests that many CIOs start their

careers with a strong technical foundation, often earning undergraduate degrees in computer science, information technology, or engineering. Interviewed CIOs highlighted that these fields provide the critical technical skills necessary for the roles leading up to a CIO position. As prospective CIOs advance in their careers and transition into leadership roles, the need for strong business acumen grows, prompting a shift toward business education at the graduate level.

4.1.3 MBA

It is commonly assumed that a Master of Business Administration (MBA) degree is essential for reaching a top executive position in a major organization. However, our data suggest otherwise; only 19% of the executives in our sample hold an MBA. A closer examination by role reveals notable differences. CFOs have the highest MBA attainment rate at 34.5%, followed by COOs at 27.4% and CMOs at 22.8% (see Figure 1). Many executives already hold undergraduate degrees in business-related fields, such as accounting or finance, which may reduce the perceived need for an MBA and allow them to explore alternative educational paths for professional development.

For CIOs, the MBA attainment rate aligns closely with the overall average at 18%. While an MBA can complement a CIO's technical expertise by providing a deeper understanding of business operations, this study challenges the belief that an MBA is indispensable for executive leadership in Fortune 500 companies. Although about half of CIOs hold a graduate degree, only 38% of these are MBAs. Thus, the path to CIO leadership emerges as a multifaceted combination of diverse educational experiences, with an MBA being just one of many possible components.

In our interviews with Fortune 500 CIOs, we examined the perceived importance of an MBA for those in the CIO role. Responses varied based on the type of CIO position and the organization's expectations. In some companies, particularly where CIOs report to the CFO (Jones et al., 2020), CIOs are expected to focus on managing infrastructure without engaging in strategic or financial discussions. In these contexts, an MBA may be seen as less critical, as the role is more operational than strategic. For example, the Electronics CIO, who did not have an MBA, was valued for his ability to enhance processes through technology, without being expected to contribute beyond that scope. In contrast, the Managed Solutions CIO noted that market forces increasingly make an MBA or equivalent knowledge more important. Despite these differences, all interviewed CIOs emphasized the necessity of understanding business concepts, particularly in finance, value creation, and strategy. An MBA is often viewed as a valuable tool for CIOs who advanced through technical roles and lack formal business education.

This raises the question of whether all CIOs should pursue an MBA. Nevertheless, the interviewees provided several reasons against this notion. One CIO mentioned that many large firms offer internal education programs to develop business knowledge for employees being prepared for leadership roles. Another noted that business acumen can be acquired on the job over time.

Overall, our interviews align with the earlier analysis, emphasizing that while technical expertise remains essential for CIOs, business acumen—whether gained through an MBA or other means—is increasingly important for the strategic dimensions of the role.

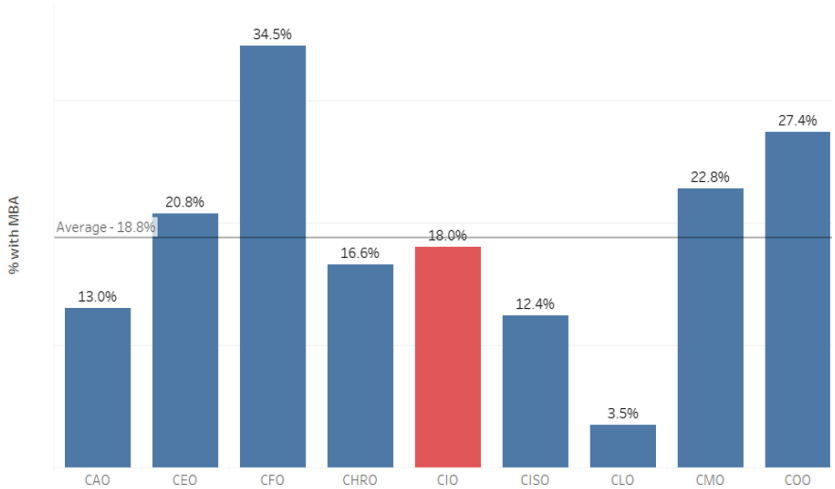

Figure 3. Percentage of Fortune 500 Executives with an MBA Degree

4.2 Schools CIOs Attend

A key educational trend identified in our analysis of Fortune 500 executives is their frequent attendance at elite universities. For this study, a university is classified as "elite" if it ranks in the top 100 of the 2022 U.S. News & World Report Best National University Rankings (see U.S. News, 2022). Elite universities, as characterized by U.S. News and similar rankings, garner reputations through rigorous academic standards, distinguished faculty, and exceptional research opportunities. They attract high-achieving students and offer diverse academic programs, state-of-the-art facilities, extensive resources, and comprehensive library collections. Additionally, their focus on diversity, inclusivity, and the development of critical thinking, innovation, and leadership skills aligns well with the demands of talent-driven Fortune 500 companies.

Table 4. Degrees Earned from Elite Universities by Fortune 500 Executives

Degree	% of Total Degrees
Bachelor - BA	50%
Bachelor - BS	41%
Master	49%
MBA	69%
JD	75%
PhD	59%

Approximately half of Fortune 500 executives receive their undergraduate education from elite institutions (see Table 4). This proportion increases significantly among those with advanced degrees, indicating that education from an elite institution, particularly at the graduate level, is often seen as a key factor for reaching executive leadership in major corporations.

In contrast, the reputation of undergraduate institutions holds less sway for Fortune 500 CIOs. Only 32% of CIOs obtain their bachelor's degrees from elite universities, a rate significantly lower than that of their C-suite counterparts. However, the emphasis on elite education shifts notably at the graduate level, with 64% of CIOs pursuing advanced degrees at top institutions. This suggests that CIOs may place greater value on attending elite schools for postgraduate education.

In interviews, half of the CIOs cited financial limitations as a reason for not attending top-100 universities at the undergraduate level. Their motivations for attending elite institutions for graduate degrees varied. Some emphasized the prestige of a higher degree from a top school as crucial for hiring, while others downplayed the significance of differentiating between top-100 and other institutions, noting that the majority of graduate programs are housed within elite schools. One interviewee mentioned that their choice of school was dictated by their employer. Despite these differing views, most agreed that a master's or Ph.D. from a top-100 university carries substantial weight on the market. Table 5 highlights the top ten universities most frequently attended by current Fortune 500 CIOs for their advanced degrees.

Table 5. Degrees Earned from Elite Universities by Fortune 500 CIOs

Institution	Count of Fortune 500 CIO
Harvard University	26
University of Pennsylvania	13
Stanford University	11
Northwestern University	11
Massachusetts Institute of Technology	11
University of Michigan	9
The University of Texas at Austin	9
The University of Chicago	8
Rensselaer Polytechnic Institute	8
Columbia University	7

We also find that approximately 20% of executives were appointed to C-suite positions in companies where another top executive shared the same alma mater (see Figure 4). These educational connections may indicate a common level of education or similar skill sets, fostering greater confidence among chief officers in the capabilities of potential hires.

However, this trend is less pronounced among CIOs. Only 11% of CIOs share an alma mater with another executive in their company—the lowest proportion among all C-suite roles. This difference likely reflects the unique demands of the CIO position, which prioritizes specialized technical skills and the ability to manage IT infrastructure and lead digital transformation. As a result, recruitment for CIOs tends to focus on technical expertise rather than on prestigious or shared educational backgrounds.

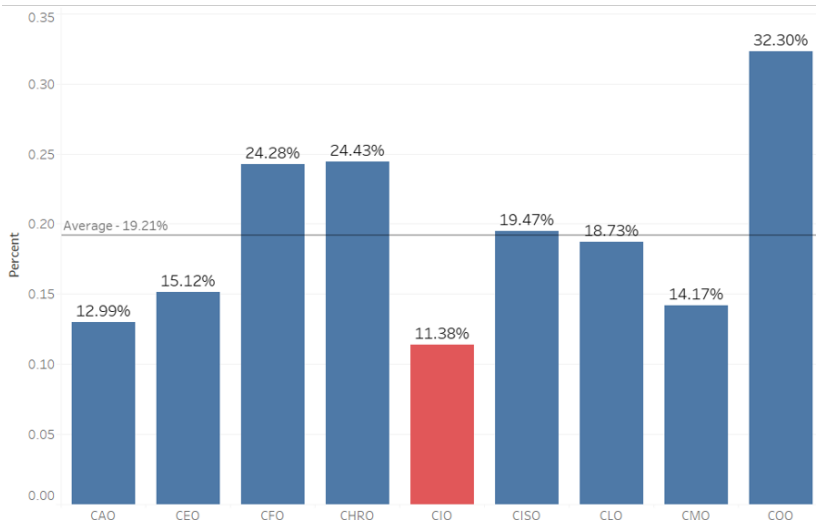

Figure 4. Percentage of Executives who were Hired into a Fortune 500 Organization with Another Chief Officer in the C-Suite who Attended the Same University

5 Work Experience

Fortune 500 chief executives follow diverse career paths to reach the top. Some executives work their way up the corporate ladder at a single organization while others jump from job to job and from company to company in search of promotion and advancement. Understandably, it is rare for aspiring chief officers to begin their first job out of school at the helm of one of the most profitable corporations in the world. Our analysis of LinkedIn profiles for current Fortune 500 executives identifies distinct patterns in the experiences and career moves that contribute to attaining leadership roles within top organizations.

5.1 Where CIOs Work and for How Long

In the dynamic corporate environment, it is common for professionals, including Fortune 500 executives, to change companies, roles, and even career paths. On average, a Fortune 500 executive works at nearly five different companies before securing a C-suite position. However, career mobility varies across executive titles. CIOs typically work at more companies, averaging around six, compared to CEOs, CAOs, and COOs, who average closer to four (see Figure 5). A t-test confirms that the difference in the number of companies between CIOs and other executives is statistically significant ($t = 5.19$, $p < .001$). Additionally, the average tenure per company differs; CIOs typically stay about six years per organization, while CEOs remain for approximately nine years. This suggests that prospective CIOs often work at more companies than their counterparts to reach executive leadership.

In interviews, CIOs offered several reasons for their higher mobility: the transferability of IT skills across companies, the desire for new challenges, opportunities for advancement, pressure from recruiters, the need for multidisciplinary experience, and organizational restructuring. The Managed Solutions CIO stressed the importance of diverse experiences for aspiring CIOs, noting that moving to different companies is often necessary to gain the required expertise. For example, a skilled analyst might not have access to project management opportunities at their current company, making it essential to seek out roles elsewhere to advance their career.

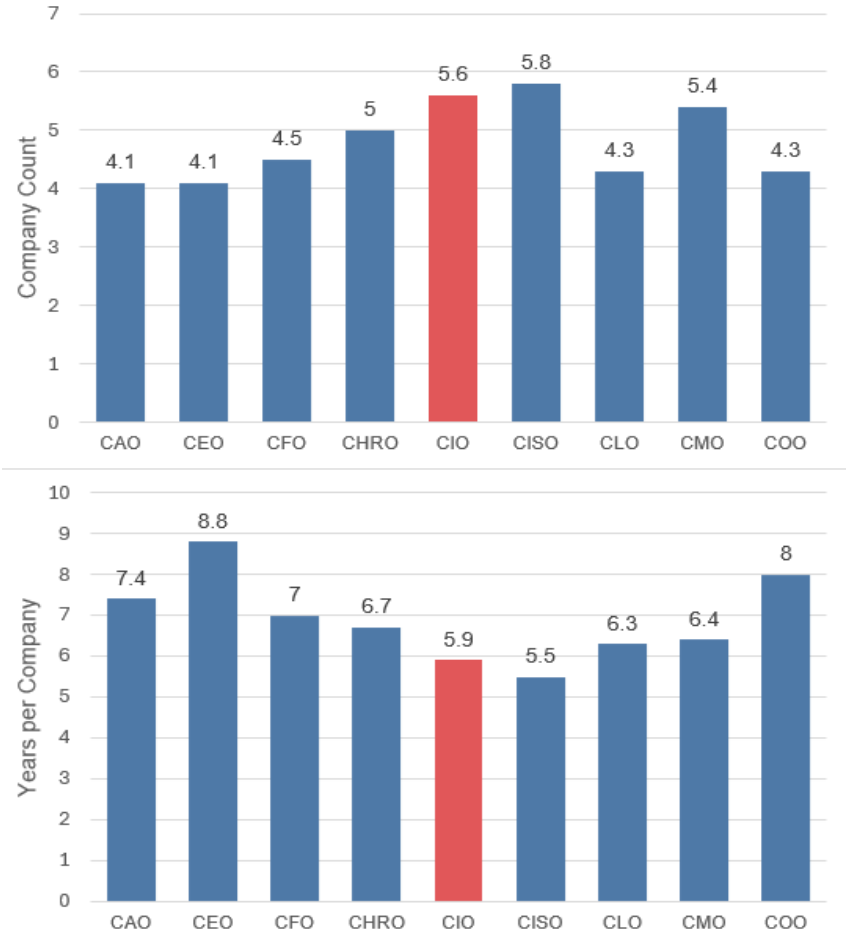

Figure 5. Average Number of Companies and Time in Each Company Prior to Becoming a Fortune 500 Executive

Table 6 presents the most common companies where Fortune 500 CIOs worked before assuming their current executive roles. Due to the relatively low counts, we conclude that no single employer offers a clear advantage in achieving a Fortune 500 CIO position. This conclusion is further supported by our data, which shows that current Fortune 500 CIOs were employed by 1,690 distinct companies across a broad range of industries. These findings suggest that neither the specific industry nor individual employer provides a definitive path to becoming a Fortune 500 CIO.

Table 6. Most Common Companies for Future Fortune 500 CIOs to Work For

Company	Industry	Count of Future Fortune 500 CIOs
Accenture	Business Consulting and Services	14
IBM, IT	IT Services and IT Consulting	14
Ingersoll-Rand PLC	Diversified machinery	10
GE, manufacturing	Industrial Machinery Manufacturing	10
Lam Research	Semiconductor Manufacturing	9
Kraft Heinz Co	Food and Beverage Services	9
PayPal	Technology, Information and Internet	9
Micron Technology	Semiconductor Manufacturing	8
Duke Energy	Utilities	8
Sysco Corp	Food and Beverage Services	8
Zimmer Biomet Holdings	Medical Equipment Manufacturing	8

Baker Hughes	Oil & Gas	8
Southern Co	Utilities	8
Corning Inc	Glass, Ceramics and Concrete Manufacturing	8
McKesson Corp	Hospitals and Health Care	8
MSCI Inc	Financial Services	8

We also examine whether individuals in our sample were hired into the C-suite from within the same company (internal hire) or from a different company (external hire). The results show that 13.6% of CIOs were internal hires for their Fortune 500 positions, compared to 17.8% of other executives. A t-test confirms that this difference is statistically significant ($t = 2.17$, $p = .03$).

5.2 The Loyalty Reward

Loyalty to a company often reflects a deep commitment to the organization's growth and success, as demonstrated by an employee's prolonged tenure and efforts to advance within the same company. This commitment usually involves foregoing opportunities at other companies, which might offer higher salaries or more influential positions, in favor of long-term career development within a single organization.

In our sample of Fortune 500 executives, only 13% had a single company listed on their profile. This suggests that ascending the corporate ladder within a single organization to attain a prestigious C-suite position is relatively rare among top executives. While certain aspirants, such as aspiring CEOs (24%), may occasionally benefit from sustained long-term employment within the same organization, less than 10% of Fortune 500 CIOs exemplify this traditional notion of company loyalty (see Figure 7).

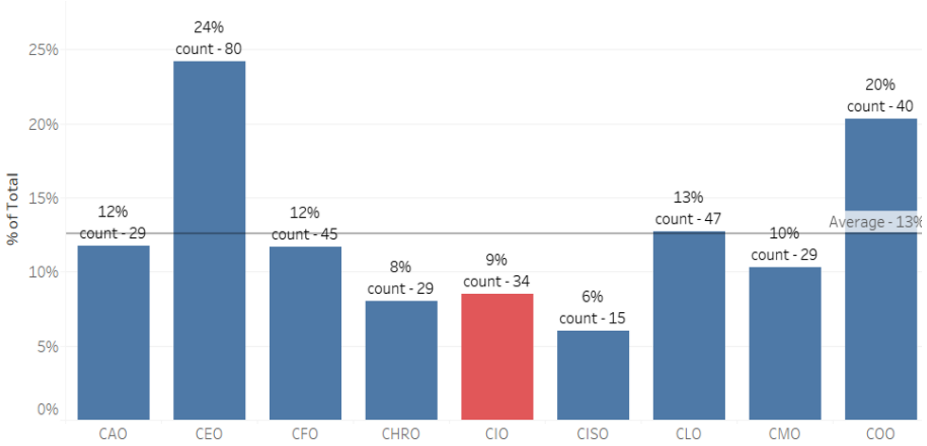

Figure 6. Percentage of Executives Who Ascended to Fortune 500 Leadership Within the Same Company

These findings suggest that prior executive experience in different organizations significantly increases the likelihood of securing a top position at a prestigious company, particularly for CIOs. Interviewed CIOs reinforced this, noting that Fortune 500 companies prefer to make safe hires by selecting experienced CIOs with proven track records. The Information Technology CIO explained that working as a CIO in a smaller organization often involves overcoming substantial challenges. The ability to navigate these difficulties, maintain composure, and implement improvements is crucial for success at the Fortune 500 level.

While it is not impossible to rise from an entry-level position to the executive suite within a Fortune 500 company, this path is relatively uncommon, especially for CIOs. For technical leaders, success appears to come from gaining executive experience at smaller organizations before advancing to higher-impact roles within larger, more prestigious firms.

5.3 Positions CIOs Work In

Having experience across a variety of roles (e.g. project manager, junior programmer, etc.) appears to be associated with the ability to ascend the corporate ladder. Career progression typically involves changing roles, either through promotions within the same company or by transitioning to different companies or

industries. Our data show that for CIOs, a broader range of experiences across multiple roles is particularly crucial for reaching senior leadership positions.

CIOs in our sample averaged 4.5 years per position and held approximately eight different roles before securing an executive position within a Fortune 500 company (see Figure 6). In comparison, other executives averaged 5.3 years per position and held 7.2 roles before achieving executive status. A t-test confirms that the difference in the number of positions held between CIOs and other executives is statistically significant ($t = 3.35$, $p < .001$). This provides evidence that CIOs tend to be more transient than their peers. Moreover, CIOs hold an average of 1.4 positions at each company they work for.

We find that approximately 34% of the positions held by CIOs in our sample are technical, compared to an average of 7% for all other executives. A t-test confirms this difference is statistically significant ($t = 18.33$, $p < .001$). We classify a position as technical if it includes terms such as "analyst," "engineer," "data," "software," "technical," or "technology," capturing titles like "software engineer" and "data analyst." While CIOs hold significantly more technical roles than other executives, the vast majority of their positions prior to becoming CIOs are non-technical.

In response to these findings, the interviewed CIOs consistently emphasized the distinct nature of the CIO role. CIOs manage a broader range of functions than other executives and require a deeper understanding of diverse roles within the IT department. Consequently, CIOs need more varied work experiences, which take longer to acquire. To effectively manage an organization's IT function, CIOs must comprehend the responsibilities of the many different roles under their supervision. For example, the Lodging CIO noted that a diversity of IT roles reports to the CIO, which is not the case with other executives. He stressed that to be an effective leader, a CIO must be capable of leading all the roles within their division. Consequently, CIOs should gain experience in more roles than their C-suite counterparts before they are sufficiently equipped to lead the IT function of an organization.

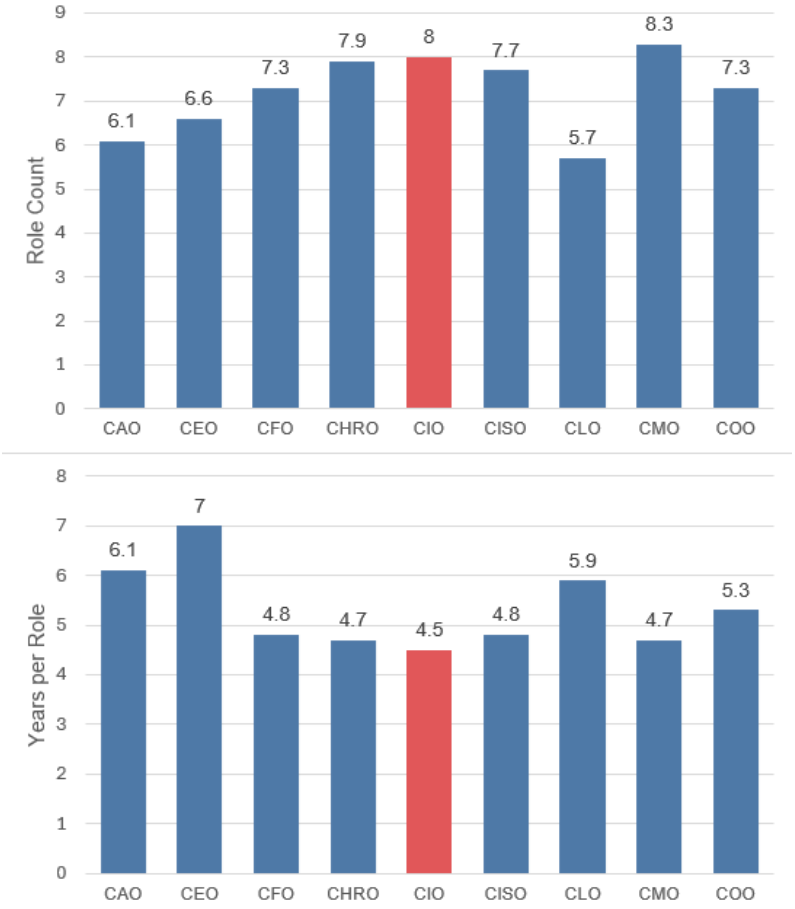

Figure 7. Average Number of Roles and Time Spent in Each Role prior to becoming a Fortune 500 Executive

As prospective CIOs progress through various roles, securing a CIO position at a Fortune 500 company as their first appointment in this capacity is relatively rare. We find that only 10% of Fortune 500 CIOs begin their executive careers within a Fortune 500 company. More commonly, these individuals first serve as CIOs at firms outside the Fortune 500, gaining experience that later qualifies them for recruitment into these top-ranked organizations. This figure is significantly lower than for other C-suite roles, such as CAOs (32%), CISOs (29%), and CLOs (27%).

This disparity suggests that while previous executive experience within the Fortune 500 is less critical for other roles when transitioning into leadership, Fortune 500 companies place considerable emphasis on prior CIO experience when recruiting for their top IT leadership positions.

6 Time to The Top

Securing a chief officer position, such as a CIO role, typically represents a significant career milestone requiring substantial time and dedication. A considerable investment of time and meaningful experiences are often prerequisites for any executive level position, with additional time usually required to ascend to top-tier leadership roles, such as those in Fortune 500 companies.

For the executives in our sample, obtaining a chief officer position is rarely a quick process. On average, it takes about 11 years for an aspiring executive to attain their first C-suite role after graduating from university. CIOs generally take longer, averaging 12.5 years, while CEOs and CFOs ascend more quickly, averaging 9.2 and 9.8 years, respectively (see Figure 8). The faster progression of CEOs and CFOs compared to CIOs suggests a difference in the experience required for these roles. Organizations recruiting CIOs or other technology-focused officers, such as CISOs (who average 13.7 years), tend to prioritize extensive experience. This reflects the additional time needed to develop the specialized technical skills and expertise essential for the CIO role, compared to those of a CEO or CFO.

Interviewees highlighted that the CIO position requires a broader range of knowledge than other C-suite roles, necessitating a longer and more varied career path. Many were surprised to learn that the average time to secure a first CIO role is only 12.5 years, believing it generally takes take longer.

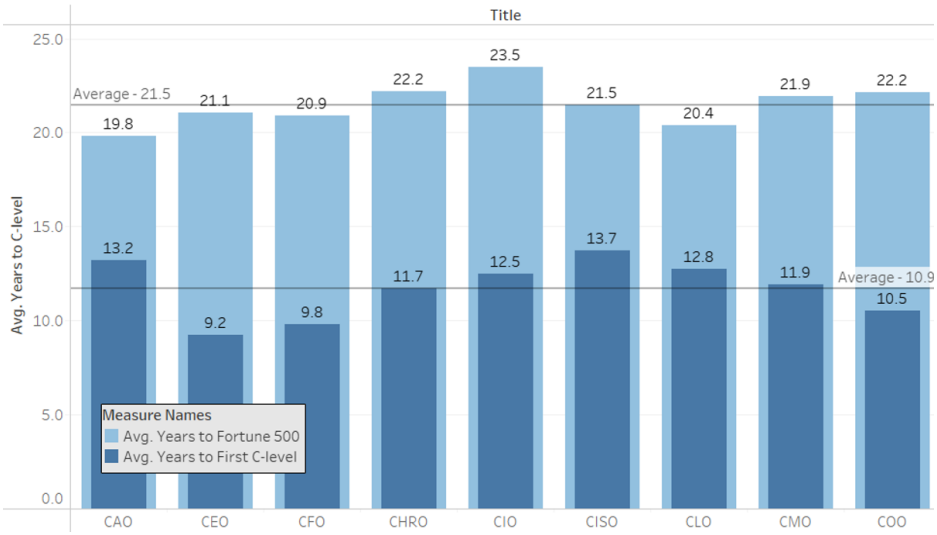

Figure 8. Average Years to Reach First C-Level Position (bottom bars) and Average Years to Reach the Fortune 500 (top bars)

Becoming an executive at any organization demands a substantial investment of time, and this duration typically extends further for those aspiring to join the ranks of a Fortune 500 company. On average, it takes 21.5 years from the start of an executive's career—or roughly 9.8 years after entering a C-level role—to reach a position within a Fortune 500 company. The path to a Fortune 500 CIO role is notably longer, averaging 23.5 years from career commencement, or around 11 years after securing the first C-level position. A t-test reveals a statistically significant difference in the time it takes CIOs versus other executives to attain Fortune 500 roles ($t = 4.01$, $p < .001$).

A recurring theme in interviews with Fortune 500 CIOs was the extended time technical professionals need to develop a strategic, value-oriented understanding of the businesses they serve, beyond a purely

technical perspective. In addition to acquiring business acumen, these professionals must also learn to communicate effectively within that context. Ironically, while technical expertise can accelerate early career progression, it becomes less relevant as the CIO role increasingly demands strategic thinking and leadership capabilities. The interviewees noted that professionals in business roles like accounting, finance, and marketing tend to grasp the language and values of business more quickly than their technical counterparts, who may remain focused on different skill sets for much of their careers. This suggests that ascending to the top in a technical field is more challenging and time-consuming, as it requires mastering both technical and business domains.

The Lodging CIO added that vacancies for top CIO positions are rare because many incumbent CIOs remain in their roles due to their desirability. He emphasized that the company's perception of technology influences CIO tenure. When technology is viewed as a cost center, the role is less demanding, leading to longer tenures. In contrast, when technology is seen as a business enabler, the role becomes more demanding, and entrepreneurial CIOs often seek new opportunities, resulting in shorter tenures.

7 Reducing the Time to the Top

Although there is no guaranteed path for rapid advancement to the executive level, identifying key career milestones that significantly influence the time it takes prospective CIOs to reach the C-suite can provide insights for potentially accelerating the process. To explore these milestones, we apply ordinary least squares (OLS) multiple regression analysis to compare the career characteristics of CIOs to those of other executives, enabling us to determine which factors expedite or delay an individual's progression to 1) their first C-level position, and 2) their C-level position at a Fortune 500 company.

7.1 Regression Data

We use LinkedIn data, as discussed throughout this paper, for the predictive analysis. Observations missing our two dependent variables were excluded while missing values in independent variables were imputed using the mean for normally distributed variables and the median for highly skewed variables. This yielded a final sample of 383 CIOs and 2,606 total executives. Additionally, we integrated organizational-level data from Compustat, an S&P database containing financial and market information on publicly traded companies. We merged the Compustat data with our LinkedIn sample based on the Fortune 500 company where each executive is employed. As a result, the analysis includes two dependent variables, eleven predictor variables, and four organization-specific variables. Table 7 provides an overview of the variables included in the regression analysis and details their measurement types and corresponding definitions.

7.2 Measures

7.2.1 Dependent Variables

The primary aim of this analysis is to identify the career characteristics most predictive of the time it takes to attain CIO positions, specifically focusing on two outcomes: the time to first CIO position and the time to a CIO position in the Fortune 500. The dependent variables are defined as follows: *Time to First* refers to the number of years from the start of an executive's career to their first C-level position, while *Time to Fortune 500* captures the number of years until the executive secures their first executive role in a Fortune 500 company.

7.2.2 Predictor Variables

Key career characteristics, identified in the prior sections as distinguishing factors between CIOs and other executives, are included in the analysis. These include educational attributes, such as the number of *Degrees* earned, attending elite universities (*Elite University*)—operationalized as the ratio of total degrees earned to degrees from elite institutions—or obtaining an *MBA*. Additionally, the analysis accounts for having earned a *Technical Degree*, defined as a degree in information systems, computer science, or engineering.

Other career characteristics considered include the number of *Positions* held, the number of *Companies* worked for, and a history of working in technical roles. *Technical Positions* are defined as the ratio of technical positions held to the total number of positions held. Current Fortune 500 executive positions are excluded from the ratio because they are inherently non-technical in nature. Technical positions were

identified by labeling positions that contain the terms “analyst,” “engineer,” “data,” “software,” “technical,” or “technology.” This allowed us to capture position technical position titles like “software engineer” and “data analyst.” We also consider the *Internal Promotion* variable, a binary indicator where 1 denotes that the position prior to the Fortune 500 C-level role was within the same company (internal hire), and 0 denotes an external hire.

Demographic controls for *Gender* and *Ethnicity - White, Ethnicity- Nonwhite,* and *Ethnicity - Indetermined* are included in the analysis. For a detailed explanation of how these variables were derived from the LinkedIn data, refer to the ‘Gender and Ethnicity Identification Methodology’ section of this paper.

7.2.3 Organizational Variables

We also account for the impact of various organizational characteristics on the time it takes to reach an executive position in the Fortune 500. Given the limited and variable nature of organizational-level information on LinkedIn, we supplemented it with data from the Compustat database. We first identified companies classified within the technology industry, as indicated by the Global Industry Classification Standard (GICS) sector code 45. This category includes firms in IT services, software, communications equipment, technology hardware, storage and peripherals, electronic equipment, instruments and components, and semiconductors. The *Tech Industry* variable is included in the analysis as this sector is characterized by rapid innovation, high competition, and a strong demand for effective technical leadership. We anticipate that these factors may necessitate more experienced CIOs, as companies prioritize leaders with technical expertise and the ability to navigate fast-paced technological advancements.

We also consider key financial rankings: *Revenue* and *CapX*, which reflect each company’s revenue and capital expenditures, respectively, during the fiscal year. These variables were logged to normalize the heavily right-skewed distribution of the two measures. While all Fortune 500 companies are, by definition, high-revenue organizations, there is considerable variation in revenue among the highest and lowest-grossing firms. Capital expenditures, defined as the funds a company allocates to acquire, upgrade, or maintain physical assets such as property, buildings, or equipment, are essential for growth and operational expansion. Companies with higher capital expenditures and revenue often require more experienced or specialized leadership, which may influence the time it takes for executives to ascend top positions.

We also consider the geographic region of the company’s headquarters as regional factors may influence the time it takes to reach an executive role. Variations in economic activity, industry presence, and the size of local job markets can affect career advancement opportunities. Regions with a higher concentration of Fortune 500 companies or technology firms, along with differences in cost of living, access to professional networks, and competitive pressures, may provide faster career progression. Headquarters locations were categorized into five regions: *Northwest, Northeast, Southwest, Southeast,* and *Midwest* (see Appendix B for state classifications within each region).

Table 7. Variables used in the Regression

Variable	Measurement	Definition	Source
Dependent Variables			
Time to First	Continuous	Number of years from the start of an executive’s career to their first C-level position	LinkedIn
Time to Fortune 500	Continuous	Number of years from the start of an executive’s career to their C-level position in the Fortune 500	LinkedIn
Executive Predictor Variables			
Gender	Binary	1 = male, 0 = female	LinkedIn
White	Binary	1 = ethnicity is coded as white	LinkedIn
Nonwhite	Binary	1 = ethnicity is coded as non-white (0 = ethnicity is undetermined)	LinkedIn
Companies	Continuous	Total number of companies worked for (inclusive of current company)	LinkedIn
Positions	Continuous	Total number of positions worked in (inclusive of current position)	LinkedIn

Tech Positions	Ratio	Total number of positions worked in (not inclusive of current position) divided by the number of positions identified as being technical in nature	LinkedIn
Internal Promotion	Binary	1 = position prior to F-500 C-level position was in the same company, 0 = external hire to F-500 company	LinkedIn
Degrees	Continuous	Total number of degrees earned	LinkedIn
Elite Univ	Ratio	Total number of degrees earned divided by the number of degrees earned from an elite university (U.S. News top 100)	LinkedIn
MBA	Binary	1 = earned an MBA, 0 = no MBA	LinkedIn
Tech Degree	Binary	1 = executive earned a technical degree, which includes degrees such as Information Systems, Computer Science, or Engineering	LinkedIn
*Organizational Variables**			
Revenue	Continuous	log + 1 of company revenue in the fiscal year (1 = high)	Compustat
CapX	Continuous	log + 1 of company capital expenditures in the fiscal year (1 = high)	Compustat
Tech Industry	Binary	1 = Company classified as being within the technology industry	Compustat
Northwest Southwest Northeast Southeast Midwest	Binary	1 = Company headquarters is located in the geographic region	Compustat
Note: * organizational variables are only included when regressed on Time to Fortune 500			

7.3 Results

Descriptive statistics for the measures included in the regression analyses, including means, standard deviations, and correlations are reported in Appendix B.

To identify career characteristics predictive of the time it takes to reach executive positions and to compare CIOs with other executives, we estimate four models, reported in Table 8. The dependent variable for Models 1 and 2 is the time it takes to attain a first C-level position, with Model 1 including all executives and Model 2 focusing solely on CIOs. Models 3 and 4 predict the time to reach a C-level position within a Fortune 500 company, with Model 3 encompassing all executives and Model 4 specific to CIOs. Models 1 and 3 exhibit robustness, with significant F-statistics of 11.56 and 20.94 ($p < .001$), respectively. Model 2, which focuses on CIOs, shows a lower F-statistic of 2.195 ($p < .05$), while Model 4, also specific to CIOs, has an F-statistic of 1.802 ($p < .05$).

All four models have relatively low R-squared values: 0.043 for Model 1, 0.056 for Model 2, and 0.124 and 0.082 for Models 3 and 4, respectively. However, in the context of career trajectories, low R-squared values are not necessarily problematic. The complexity of career paths—where time to a senior leadership position is influenced by numerous factors that are difficult to quantify (e.g., personal characteristics, organizational culture, and external factors)—often results in lower explanatory power. Despite this, the statistical significance of the independent variables in our models indicates that they still exert a meaningful influence on career progression and offer valuable insights. We now identify the individual career characteristics that impact time to the top for each model.

Table 8. Regression Models for Time to the Top

Variables	Dependent Variables			
	Years to First C-level Position		**Years to Fortune 500 C-level Position**	
	Model 1 - All	*Model 2 - CIO*	*Model 3 - All*	*Model 4 - CIO*
Gender	-0.324	-0.627	-0.186	-0.145
	(0.342)	(1.020)	(0.311)	(0.871)
White	-0.576	-0.903	-0.120	0.036
	(0.431)	(1.266)	(0.392)	(1.078)

Nonwhite	**-0.948†**	-0.717	**-1.078***	-0.944
	(0.572)	(1.495)	(0.522)	(1.282)
Companies	0.020	**-0.427†**	**0.184*****	**0.123†**
	(0.085)	(0.224)	(0.078)	(0.194)
Positions	**0.310*****	**0.585****	**0.559*****	0.316
	(0.064)	(0.184)	(0.059)	(0.158)
Tech Positions	**2.542****	**2.764†**	1.038	1.646
	(0.862)	(1.512)	(0.786)	(1.314)
Internal Promotion			**-1.550*****	**-2.471***
			(0.413	(1.152)
MBA	**-2.007*****	-1.503	-0.359	-0.664
	(0.362)	(0.996)	(0.329)	(0.854)
Degrees	**0.875*****	0.187	0.212	0.366
	(0.223)	(0.588)	(0.203)	(0.509)
Elite Univ	-0.044	1.213	0.578	-0.310
	(0.403)	(1.170)	(0.367)	(1.003)
Tech Degree	0.113	-0.384	0.446	0.735
	(0.421)	(0.872)	(0.383)	(0.751)
Tech Industry			-0.551	-1.383
			(0.450)	(1.243)
Revenue			0.275	0.832
			(0.310)	(0.774)
CapX			**-0.632***	-0.739
			(0.286)	(0.722)
Northwest			**1.333†**	0.391
			(0.772)	(2.007)
Southwest			-0.023	-0.867
			(0.436)	(1.110)
Northeast			**0.589†**	-0.418
			(0.355)	(0.914)
Southeast			-0.190	-0.091
			(0.474)	(1.170)
Constant	9.144***	10.587***	17.631***	18.668***
	(0.664)	(1.985)	(1.011)	(2.729)
Observations	2,606	383	2,606	383
R^2	0.043	0.056	0.124	0.082
Residual SE	7.868 (df = 2595)	8.062 (df = 372)	7.138 (df = 2587)	6.829 (df = 364)
F Statistic	11.561*** (df = 10)	2.195*(df = 10)	20.403*** (df = 18)	1.802* (df = 18)
Note: † p < .1, * p < .05, ** p < .01, *** p < .001				

The results of Model 1 identify several statistically significant career characteristics that predict the time it takes for most executives to reach their first C-level position. First, holding a greater number of positions (B = 0.310, p < .001), particularly in technical roles (B = 2.542, p < .01), is positively associated with a longer time to reach the C-suite. Second, earning an MBA reduces the time to the C-suite by approximately two years (B = -2.007, p < .001). However, for each additional degree earned, the time to reach a C-level position increases by 0.875 years (B = 0.875, p < .001). Third, non-white executives tend to reach the C-suite nearly one year earlier (B = -0.948), though this finding is marginally significant (p < .1).

While some trends persist for CIOs, others diminish or reverse. Like Model 1, Model 2 shows that the number of positions held (B = 0.585, p < .001), particularly in technical roles (B = 2.764, p < .1), is associated with a longer time to reach a C-level position. However, the effect of earning an MBA and the statistical significance of ethnicity disappears for CIOs. Notably, for aspiring CIOs, working at more companies is linked to a reduced time to secure their first CIO role (B = -0.427, p < .1).

Model 3, which predicts the time to reach a C-level position in a Fortune 500 company, reveals that holding more positions is significantly associated with an increase in time to reach the top (B = 0.559, p < .001), though the effect of technical roles is no longer statistically significant. Working at more companies is linked to a longer time to reach the C-suite (B = 0.184, p < .001). Notably, the effect of non-white ethnicity remains significant and is even stronger compared to reaching the first C-level position (B = -1.078, p < .05), indicating that non-white executives tend to reach Fortune 500 C-level roles more quickly.

One of the most striking findings in this model is the time-reducing effect of internal versus external promotion. Being promoted internally to a C-level position within a Fortune 500 company is associated with a reduction of approximately 1.5 years (B = -1.550, p < .001). Company-specific variables are also considered in Models 3 and 4. In Model 3, higher capital expenditures are linked to a shorter time to reach a C-level position (B = -0.632, p < .05). Additionally, the geographic region plays a marginally significant role, with executives in the Northwest (B = 1.333, p < .1) and Northeast (B = 0.589, p < .1) experiencing slightly longer times to ascend to C-level roles.

Model 4, which examines the time to reach a C-level position in a Fortune 500 company specifically for CIOs, identifies relatively few statistically significant predictors. However, internal promotion within a Fortune 500 company stands out as a strong predictor of a faster ascent. With a coefficient of -2.471 (p < .05), internal promotion reduces the time to reach a C-level role by nearly 2.5 years compared to external hires. Additionally, working at more companies is associated with a longer trajectory to a Fortune 500 executive position, though this effect is only marginally significant (B = 0.123, p < .1). The absence of other significant predictors for CIOs in this model is notable in itself.

For a comparison of the results for CIOs, as shown in Models 2 and 4, with those of CEOs, refer to Appendix B.

8 Recommendations for Prospective CIOs

Based on the evidence presented in this study, we offer several recommendations for aspiring CIOs.

First, our descriptive analysis highlights key norms central to the career identity of top CIOs. These norms include earning a non-business undergraduate degree, receiving a graduate degree from an elite institution, working across multiple companies and roles, and gaining diverse experiences throughout one's career. Understanding and aligning with these norms can provide a solid foundation for following the traditional career trajectory of a top-level CIO.

Second, differentiating oneself through alternative strategies likely plays a decisive role in career advancement. Although our predictive models do not identify many clear paths to accelerate the journey to a top CIO position, this does not mean such strategies do not exist. The data in this study do not capture several vital characteristics of top executives, such as management style, specific skill sets, professional networks, or personality traits, which may also significantly influence career progression.

Interviews with current and former CIOs underscore the importance of these attributes. The Managed Solutions CIO highlights the emphasis on management education, such as MBAs and formal training, but notes that leadership—far more difficult to learn—receives less attention. Aspiring CIOs may need to seek leadership development opportunities outside traditional academic settings, which is often not reflected on platforms like LinkedIn. Similarly, the IT CIO stresses that the ability to communicate effectively, think critically, and synthesize ideas is the most sought-after competency by organizations. Additionally, the Lodging CIO advises aspiring CIOs to broaden their sphere of influence by assuming responsibility for neglected tasks and building a network of advocates and mentors. While the impact of a strong professional network is difficult to quantify, it undoubtedly plays a pivotal role in career advancement. The Pharmaceutical CIO further emphasized the critical importance of soft skills, particularly for CIO candidates with a technical background.

Third, aspiring CIOs should recognize that reaching the top of the corporate ladder requires time. Among executive roles, CIO positions take the longest to attain, especially within top-tier organizations. Our

regression analyses reveal that while there are strategies to shorten the time to executive roles for most positions—such as earning an MBA or working in fewer roles—there are few effective strategies for reducing the time to a CIO position, particularly for the most prestigious ones.

For aspiring CIOs seeking their first executive role, as evidenced by regression Model 2, we recommend gaining experience across multiple companies and avoiding an overemphasis on technical positions. This strategy is reinforced by insights from interviewed CIOs who expressed that while a technology background is essential for a CIO role, it is equally important for candidates to demonstrate their ability to prioritize broader business objectives in their work. The Lodging CIO suggests this can be achieved by taking on non-technology roles or pursuing non-technical education. Additionally, the Convenience Retailing CIO emphasizes that in the technology field, upward mobility often requires lateral movement to broaden one's experience.

The regression analysis provides evidence that the most significant factor in reducing the time to secure a CIO position within Fortune 500 companies is internal promotion. The model suggests that being promoted from within, rather than recruited externally, can shorten the path to an executive role by nearly 2.5 years. This accelerated progression likely stems from the advantage internal candidates have, as they are already familiar with the company's operations, culture, and key stakeholders. Executives aiming for these roles should focus on building strong internal networks, consistently demonstrating high performance, and strategically positioning themselves for promotion within their organizations.

However, it is important to note that the majority of aspiring CIOs will not secure positions in prestigious organizations such as the Fortune 500, given the high level of competition and the limited number of such roles. For those who do aspire to these elite positions, the journey is particularly long for CIOs. Based on insights from our CIO interviewees, individuals aiming for these roles should start early, cultivate the right motivations, and acquire a diverse range of experiences.

9 Contributions to Practice

This article examines the demographic, educational, and career characteristics of Fortune 500 CIOs, comparing them to other C-suite executives. Our analysis uncovers several statistically significant differences between CIOs and their executive counterparts. These findings, along with qualitative insights from interviews with Fortune 500 CIOs and results from regression analyses, provide valuable guidance for those aspiring to reach top-tier CIO positions.

This research also advances the understanding of diversity in upper management by highlighting the pronounced lack of ethnic and gender diversity among CIOs. Only 21% of Fortune 500 CIOs are women, and although CIOs are the most racially diverse group among executives, with 25% identified as non-white, this still falls short of broader diversity goals. These findings align with previous studies that have documented the dominance of male workers and the barriers faced by nonwhite individuals in the technology sector (Alfrey & Twine, 2017; McGee, 2018; Michie & Nelson, 2006; Von Hellens et al., 2003) as well as across executive roles in Fortune 500 firms (Brady et al., 2011). Together, these results suggest that significant obstacles persist for underrepresented groups in reaching prestigious leadership positions. This emphasizes the need for strategies that promote the recruitment and development of diverse candidates for CIO and other executive roles. Companies may benefit from adopting initiatives such as mentorship programs, leadership training focused on underrepresented groups, and diversity-focused recruitment strategies to improve representation at the highest levels.

Educational institutions can use these findings to refine their curricula, ensuring that students with aspirations for technical leadership develop both the technical and business-oriented skills required for the evolving demands of CIO roles. Specifically, given that 70% of CIOs hold undergraduate degrees in non-business disciplines, educational programs should incorporate multidisciplinary training that blends technical expertise with leadership and business management skills. The increasing demand for CIOs to possess a strategic business outlook suggests that technical programs should introduce business concepts earlier in students' academic journeys. Additionally, the fact that only 32% of CIOs earned their bachelor's degrees from elite institutions, but more than 60% obtained graduate degrees from such institutions, indicates the importance of encouraging continuous education, particularly at the graduate level, to enhance career prospects.

The study also provides benchmarks for industry standards regarding the career trajectories and educational backgrounds of leading CIOs. Organizations can leverage this data to evaluate their practices

against those of top companies and create more effective career development maps for employees aspiring to become CIOs. For instance, as our findings show that CIOs take an average of 12.5 years to reach their first CIO position and 23.5 years to reach a Fortune 500 position, and typically gain their first CIO role outside of the Fortune 500, companies should focus on providing varied experiences early in an employee's career to expedite advancement. Furthermore, organizations could consider implementing internal leadership programs that encourage cross-functional exposure and reduce the over-reliance on technical roles to help future CIOs develop the broader business acumen needed for leadership. By aligning HR strategies with these benchmarks, companies can better support the growth of their future CIOs, contributing to a more skilled and diverse leadership pipeline.

10 Contributions to Research

This paper demonstrates the utility of LinkedIn data as a valuable resource for identifying trends and patterns among working professionals. Using a large sample of 2,821 Fortune 500 executives, including 400 CIOs, allows for a more robust analysis, enabling the identification of statistically significant findings about their career characteristics. Future studies can replicate this methodology to investigate other careers, industries, or educational trends. By leveraging publicly available LinkedIn data, researchers can explore a wide range of questions related to job trajectories, skill development, and professional networking. This approach offers a scalable and cost-effective framework for understanding career progression in a dynamic labor market, where technological advances and organizational restructuring are common.

However, the use of LinkedIn data for research presents important ethical considerations. Although LinkedIn profiles are publicly accessible to anyone with an account, it is imperative to prevent the identification of specific individuals and anonymize any sensitive information. In this study, all data was aggregated, and no individual-level data was reported, ensuring the protection of personal information. Researchers must continue to follow these principles, particularly when analyzing smaller or niche datasets where identification risks are higher. Adherence to platform policies and ethical research practices is essential to maintain the integrity of studies utilizing LinkedIn and similar platform-based data sources.

This study opens several novel and potentially impactful avenues for future research. One compelling direction is to delve deeper into diversity within the ranks of CIOs and other C-suite roles. Our findings indicate that while CIOs are the most racially diverse group among Fortune 500 executives, with 25% being non-white, significant gaps in gender and ethnic representation remain. Further research could explore how different demographic groups navigate their career trajectories, the specific barriers they encounter, and how organizations can promote more inclusive leadership pipelines. Understanding the unique challenges faced by underrepresented groups could offer valuable insights for promoting diversity and equity in executive leadership.

Furthermore, the observed job mobility among CIOs, who work at an average of 5.6 companies and hold 8 different positions before securing a Fortune 500 role, points to the need for more granular research on the drivers of frequent role transitions. Investigating the career experiences that prompt executives to change companies or industries, and how this mobility impacts their progression, can offer deeper insights into organizational stability and career development. Future studies could also explore the tension between technical specialization and the broader business competencies required as CIOs advance into more strategic roles.

11 Limitations

The low R-squared values across all four regression models indicate that a substantial portion of the variability in career trajectories remains unexplained by the included variables. This limitation is inherent to OLS models when examining complex phenomena like career progression, which is shaped by numerous factors that are difficult to capture quantitatively. Future research could enhance explanatory power by incorporating additional variables, such as organizational culture, mentorship experiences, and professional networks. Researchers might also consider non-linear models to capture threshold effects in career progression, where rapid promotions may occur after achieving a certain level of experience or education.

Another limitation of this study is its exclusion of individuals who did not reach CIO positions, which precludes direct comparison between the career paths of those who succeeded in attaining CIO roles and those who did not. Without this broader perspective, it becomes difficult to fully understand the distinguishing factors that contribute to a candidate's success or failure in reaching the top IT leadership positions. The absence of this comparison limits our ability to pinpoint the critical differences in experiences, skills, or opportunities that might separate successful CIOs from their peers. Nonetheless, the descriptive and inferential analyses provide new and valuable insight into the career trajectories of the most accomplished CIOs, thereby shedding light on the patterns and strategies associated with the attainment of top CIO roles.

Additionally, the reliance on self-reported LinkedIn data may compromise the reliability and comprehensiveness of the findings. Individuals may selectively report only certain aspects of their professional background, such as listing a single degree or job position while omitting other relevant experiences. This variability in reporting at times leads to gaps in the data, reducing the completeness of the career trajectories we analyze. While the aggregation of LinkedIn profiles enables us to construct a broader picture of the executive landscape, self-reporting biases still influence the overall accuracy of the data. Some individuals may exaggerate accomplishments, underreport lateral career moves, or selectively emphasize achievements, all of which skew interpretations of career progression patterns. Despite these limitations, we believe this data offers a valuable, though imperfect lens through which to view trends and patterns in CIO career paths.

12 Conclusion

This paper fulfills three primary objectives. First, we identify key descriptive findings that underscore statistically significant distinctions between CIOs and other top executives. Second, we employ predictive modeling to explore strategies for reducing the time it takes for prospective CIOs to ascend to the C-level positions. Third, we provide actionable insights for aspiring CIOs and practitioners and generate directions for future research endeavors. Our results reveal that CIOs are more racially diverse, work at more companies, hold more positions throughout their careers, and take longer to reach executive roles in the Fortune 500 compared to their C-suite counterparts. Additionally, CIOs are more likely to have a technical educational background and attend elite universities at lower rates than other executives. The predictive analyses confirm that there are few ways, outside of internal promotion at top organizations, to expedite a CIO's journey to the top.

Acknowledgments

An earlier version of this paper was presented at the 2023 ACM SIGMIS Conference on Computers and People Research. We thank the attendees for their developmental feedback. Additionally, the CIO interviews discussed in this paper are more comprehensively reported in the 2024 MIS Quarterly Executive paper titled, 'The Path to Becoming a Fortune 500 CIO.' That paper focuses specifically on the CIOs' perspectives on their career paths, which contrasts with the descriptive and inferential empirical findings derived from LinkedIn reported in this paper.

Declaration of AI

During the preparation of this work the authors used generative AI models to serve as copyeditors to assist in correcting grammatical and syntactical errors in the writing. All ideas and work presented in this paper are the sole efforts and intellectual contributions of the authors.

References

Alfrey, L., & Twine, F. W. (2017). Gender-fluid geek girls: Negotiating inequality regimes in the tech industry. *Gender & Society*, *31*(1), 28–50.

Anderson, J., & Ball, N. (2015). The educational and career backgrounds of CIOs. *Issues In Information Systems*, *16*(IV), 178-182.

Banker, R. D., (Qian) Feng, C., & Pavlou, P. A. (2022). Businessperson or technologist: Stock market reaction to the alignment between CIO background and firm strategy. *Journal of Management Information Systems*, *39*(4), 1006–1036.

Brady, D., Isaacs, K., Reeves, M., Burroway, R., & Reynolds, M. (2011). Sector, size, stability, and scandal: Explaining the presence of female executives in Fortune 500 firms. *Gender in Management: An International Journal*, *26*(1), 84–105.

Carter, M., Grover, V., & Thatcher, J. B. (2011). The emerging CIO Role of business technology strategist. *MIS Quarterly Executive*, *10*(1), 19–29.

Chun, M., & Mooney, J. (2009). CIO roles and responsibilities: Twenty-five years of evolution and change. *Information & Management*, *46*(6), 323–334.

Engelen, A., Rieger, V., Wehner, M. C., & Heidemann, F. (2022). Is organizational commitment to IT good for employees? The role of industry dynamism and concentration. *MIS Quarterly*, *46*(4), 2387–2404.

Fortune. (n.d.). *Fortune 500 – The largest companies in the U.S. by revenue.* Fortune. https://fortune.com/ranking/fortune500/

Guillory, J., & Hancock, J. T. (2012). The effect of LinkedIN on deception in resumes. *Cyberpsychology, Behavior, and Social Networking*, *15*(3), 135–140.

Jones, M. C., Kappelman, L., Pavur, R., Nguyen, Q. N., & Johnson, V. L. (2020). Pathways to being CIO: The role of background revisited. *Information & Management*, *57*(5), 103234.

Kettles, D., Mazzola, D., & Richardson, B. (2024). The path to becoming a fortune 500 CIO. *MIS Quarterly Executive*, *23*(2).

Kratzer, S., Westner, M., & Strahringer, S. (2023). Four decades of chief information officer research: A literature review and research agenda based on main path analysis. *ACM SIGMIS Database: The DATABASE for Advances in Information Systems*, *54*(3), 37–74.

Leidner, D. E., & Mackay, J. M. (2007). How incoming CIOs transition into their new jobs. *MIS Quarterly Executive*, *6*(1), 17–28.

Mazzola, D. J., Louis, R. D. St., & Tanniru, M. R. (2017). The path to the top: Insights from career histories of top CIOs. *Communications of the ACM*, *60*(3), 60–68.

McCain, A. (2023, March 6). *35+ key LinkedIN statistics [2023]: Users, businesses, and must-know recruiter facts*. Zippia. https://www.zippia.com/advice/linkedin-statistics/

McGee, K. (2018). The influence of gender, and race/ethnicity on advancement in information technology (IT). *Information and Organization*, *28*(1), 1–36.

McIvor, M. (2022, September 2). *How many fortune 500 CEOs are on social media in 2022?* Influential Executive. https://influentialexecutive.com/how-many-fortune-500-ceos-social-media-2022/

Michie, S., & Nelson, D. L. (2006). Barriers women face in information technology careers: Self-efficacy, passion and gender biases. *Women in Management Review*, *21*(1), 10–27.

Noonpakdee, W., Phothichai, A., Khunkornsiri, T., & Nuntree, A. (2020). CIO competency in digital era: A comparative study between government organizations and private enterprises. In *2020 IEEE 7th International Conference on Industrial Engineering and Applications (ICIEA)* (pp. 948–952).

Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. *MIS Quarterly*, *27*(2), 237–263.

Smith, J. E., Carson, K. P., & Alexander, R. A. (1984). Leadership: It can make a difference. *Academy of Management Journal*, *27*(4), 765–776.

Taylor, J., & Vithayathil, J. (2018). Who delivers the bigger bang for the buck: CMO or CIO? *The Journal of Strategic Information Systems*, *27*(3), 207–220.

U.S. News. (2022). *The best national universities in America*. US News & World Report. https://www.usnews.com/best-colleges/rankings/national-universities

Von Hellens, L., Nielsen, S., & Beekhuyzen, J. (2003). Women working in the IT industry: Challenges for the new millennium. *Journal of Business & Economics Research (JBER)*, *1*(11).

Watts, S., & Henderson, J. C. (2006). Innovative IT climates: CIO perspectives. *The Journal of Strategic Information Systems*, *15*(2), 125–151.

Appendix A

Table A1. Summary of CIO-Specific Findings

Topic	Finding
Demographics	79% of CIOs are male
	CIOs are the most diverse among all executive roles with 25% of CIOs being non-white
Education – Degrees	Only 29% of CIOs earn a business-focused bachelor's degree
	46% of CIOs earn a business-focused graduate degree
	Approximately half of all CIOs earn a graduate degree
	CIOs are exactly average for getting an MBA at 18%
	54% of CIOs earned at least one technical degree
Education – Schools	Only 32% of bachelor's degrees earned by CIOs are from elite institutions
	Over 60% of graduate degrees earned by CIOs are from elite institutions
	The most popular institutions for Fortune 500 CIOs to attend include Harvard and UPenn
	Only 11% of CIOs were hired into a Fortune 500 organization with another executive from their alma mater
Companies	CIOs work at more companies in their career than most other executives (avg = 5.6)
	There is no clear company or industry that leads to a Fortune 500 CIO position
	CIOs spend less time at each company they work for than most other executives (avg. = 5.9 years)
	13.6% of CIOs at Fortune 500 companies were internal hires
	Less than 10% of CIOs worked their way up the ladder at a single company during their career
Positions	CIOs work in a greater number of positions than other executives (avg = 8)
	CIOs spend less time than other executives in each position they hold (avg = 4.5 years)
	34% of the positions held by CIOs are technical in nature
	10% of CIOs began their careers as chief officers at a Fortune 500 company
Time to the Top	CIOs take an average of 12.5 years to reach their first C-level position
	CIOs take the longest time to reach the Fortune 500 at 21.5 years
	Prospective CIOs may reduce the time to their first C-level position by working at more companies, holding fewer roles, and particularly by working in fewer technical positions.
	Prospective CIOs may reduce the time to a top C-level position by seeking out internal promotion opportunities at those same companies

Appendix B

Table B1. Geographic Area Classifications

Geographic Area	States
Northwest	Washington (WA), Oregon (OR), Idaho (ID), Montana (MT), Wyoming (WY)
Southwest	California (CA), Nevada (NV), Utah (UT), Arizona (AZ), New Mexico (NM)
Northeast	New York (NY), New Jersey (NJ), Pennsylvania (PA), Connecticut (CT), Massachusetts (MA), Vermont (VT), New Hampshire (NH), Maine (ME)
Southeast	Florida (FL), Georgia (GA), South Carolina (SC), North Carolina (NC), Alabama (AL), Mississippi (MS), Louisiana (LA)
Midwest	Illinois (IL), Indiana (IN), Ohio (OH), Michigan (MI), Wisconsin (WI), Minnesota (MN), Iowa (IA), Missouri (MO), Kansas (KS), Nebraska (NE), North Dakota (ND), South Dakota (SD)

About the Authors

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