



DREXEL UNIVERSITY

College of

Computing &
Informatics

Strategic Plan 2024-2029

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I. Introduction

This strategic plan represents the second iteration in the relatively brief history of the College of Computing & Informatics (CCI) at Drexel University. It builds upon the foundation of the original plan by continuing key initiatives while introducing new complementary ones. The aim is to craft an updated and expanded comprehensive strategic plan that will guide CCI's direction over the next five years. This plan arrives at a pivotal moment, coinciding with the rapid acceleration of the "Fourth Industrial Revolution," where information and technology (I&T) are reshaping our society and economy (refer to Section II, Environmental Scan). This transformative era is also driving changes in I&T education, research, and innovation. Coupled with intensified competition in U.S. higher education, these times present both remarkable opportunities and challenges for our College and University.

It is crucial to emphasize CCI's uniqueness. We are among a select group of I&T programs nationally that consolidate computing, data, cybersecurity, and information sciences within a college-level organization. With our comprehensive array of cutting-edge academic programs, research endeavors, a prominent faculty and professional staff, and a strong commitment to social responsibility, we possess a distinct organizational advantage that positions us to play a pivotal role in meeting the evolving societal needs regionally and nationally.

However, this advantage alone does not guarantee our leadership, impact, or sustainability in this ever-changing landscape. It necessitates a forward-looking vision aligned with the transformative role of I&T in the 21st Century economy, a strategic approach, effective execution to stay ahead of the competition, robust internal and external support systems, and a growing resource base to foster innovative programs, research, organizational development, and infrastructure enhancement.

The three overarching themes of our college's strategic plan are as follows:

- **Build Our Identity:** Continue charting a course that establishes CCI as a leader in 21st Century I&T education and research.
- **Expand Our Impact:** Develop a roadmap to secure CCI's status as a premier provider of modern I&T talent, a hub for groundbreaking and high-impact R&D, a go-to destination for I&T talent and intellectual capital in the region, and an engine for University growth.
- **Drive Strategic and Sustainable Growth:** Formulate strategies for driving the College's growth in enrollment, academic offerings, research funding, and resources in a strategic and sustainable manner.

These elements are vital for scalable growth and impact and for providing the necessary resources to fortify our organization and programs.

II. Environmental Scan

The U.S. and global economies continue to undergo rapid and profound transformations, primarily fueled by advances in information and technology. The recent meteoric rise of artificial intelligence, often referred to as the "Second Machine Age" or the "Fourth Industrial Revolution," exemplifies this dynamic shift. Artificial intelligence and machine learning (AI/ML), exemplified by technologies like ChatGPT, have ushered in an era where AI/ML is catalyzing change across the education and business sectors.

Simultaneously, global society has experienced massive upheaval due to the COVID-19 pandemic and its subsequent effects on employment, transportation, supply chains, and numerous aspects of the global marketplace. These swiftly changing economic demands necessitate substantial adjustments in university education, research, and the broader roles played by universities locally, nationally, and globally.

This ongoing evolution, characterized by its rapid pace and coupled with other significant trends, is presenting both vast opportunities and challenges that are shaping developments across higher education institutions nationwide. These changes have had a profound impact on Drexel University, and the University's response to these changes will have far-reaching implications for the future of Drexel University and the College of Computing & Informatics (CCI). CCI, with our focus on the integration of technology across all disciplines, should play a singular role in helping the University craft its future in this environment.

CCI is uniquely positioned to respond to these seismic shifts in the economy and higher education, leading the charge in redefining computing and informatics education and research for the coming decades of the 21st Century. However, both the College and the University face significant challenges that must be addressed to ensure sustained growth and success.

This strategic plan serves as a five-year roadmap, guiding the College in securing a leadership position in computing and informatics education and research within the new economy. The plan seeks to expand the College's role within the University and the region while enhancing sustainability. Moreover, it underscores the importance of exemplifying and articulating CCI's unique strengths and value proposition.

The following section outlines local conditions and CCI's broader operational environment, providing insights into the College's position within this dynamic context. This summary lays the foundation for CCI's strategic direction and planning.

II.1. Overview

In the 21st Century, every industry is undergoing transformation into an I&T industry, with I&T affecting every facet of people's lives. Industry is now transitioning to a phase where I&T not only provides infrastructure support but also plays a central role in driving all aspects of operations and innovation. This shift positions I&T at the forefront of industry and society, transforming it

from a historically siloed orientation to a cross-cutting and multidisciplinary position, from a vertical to a horizontal structure.

Current technological advances and the proliferation of Big Data have accelerated developments in areas such as cybersecurity, analytics, cloud computing, robotics, and the Internet of Things (IoT), offering unprecedented possibilities for science, engineering, business, and society. Of particular significance is the rapid rise in AI/ML technology, leading to innovations that are already reshaping society. In short, modern society is entering an era of innovation where I&T is becoming inseparable from people and industry.

These changes carry significant implications for both the University and CCI:

- There is a growing demand for Information and Technology (I&T) talent, fueling the expansion of I&T programs.
- Beyond its societal value, diversity and inclusion are essential for increasing the talent pool, bridging a rapidly widening talent gap, and offering new perspectives on the role of technology in society.
- There is a need for a broader range of specialized academic programs to support the explosive growth in the I&T fields. These programs will equip a new generation of workers with deep technical knowledge and skills, creativity, a strong sense of social responsibility, and robust entrepreneurial problem-solving, social, and communication skills.
- As I&T permeates every facet of society and industry, there is a growing demand for specialists across various disciplines, ranging from engineering and business to social sciences and the humanities. Relevant knowledge and skills are crucial to leverage the increasingly complex and indispensable I&T tools available in every profession.
- The nature of work is evolving, incorporating automated decision-making tools like never before. This shift requires a new paradigm of training and education firmly rooted in I&T.
- Problem-driven, multidisciplinary, and team-oriented Research and Development (R&D) is becoming even more critical and prevalent in the modern economy. Similarly, the models for federal and industry research funding have shifted in similar directions.

Meanwhile, higher education institutions in the United States, including Drexel University, face mounting pressure and potentially disruptive changes on multiple fronts:

- Due to lower birth rates and geographic out-migration, it is predicted that colleges and universities in the Northeast will experience a 15% decline in enrollment starting in 2025, with implications for undergraduate enrollment competition, particularly for universities like Drexel that traditionally rely on regional undergraduate enrollment.
- Rising higher education costs and tuition, coupled with stagnant middle-class incomes and declining state funding for public higher education, have raised concerns about college affordability and exacerbated social and political tensions.
- Advancements in technology and rapidly changing job markets are driving growth in online education and alternative revenue sources for education and training, such as

MOOCs and coding schools. Online education is becoming an integral part of the higher education business model, necessitating the integration of online offerings with traditional on-campus education. Partnerships between traditional higher education and the for-profit sector offer sought-after branded degrees at significantly lower costs (e.g. Georgia Tech's online MS in Computer Science is offered through Coursera at a total cost of \$4,500.). Disruptive changes driven by AI, automation, and robotics are also increasing the demand for adult education and skills-oriented training, necessitating substantial changes to higher education organizations.

- There has been an explosion of new delivery methods and educational products, including microcredentials, which have gained popularity due to their just-in-time availability and low cost.
- International students play an indispensable role in the financial well-being and research enterprise of US universities. However, global geopolitical tensions and the lingering effects of the COVID-19 pandemic introduce uncertainties for American higher education institutions.

These environmental factors simultaneously present significant opportunities and challenges and introduce risks for both Drexel and CCI. To capitalize on these opportunities while mitigating the inherent risks, CCI must drive systematic and systemic change across all aspects of the organization, including its structure, academic programming, research, and partnerships. CCI's future depends on its ability to position both CCI and Drexel at the forefront of the new economy, meet market demands, and secure recognition for the College and University as leaders in the evolving higher education landscape.

II.1.1. History and Profile of the College

CCI is a leader in the competitive field of computing and informatics education and research. Few peer institutions offer comprehensive programs in both computing and information science, making CCI's contribution to the field significant and its growth potential virtually limitless. With an enrollment of approximately 2,000 students and a world-class faculty comprising over 60 professors and researchers, CCI is poised for substantial growth over the next five years.

The academic portfolio currently includes undergraduate, graduate, and doctoral-level degrees in areas such as computer science, software engineering, data science, information science, information systems, health informatics, library and information science, and cybersecurity. These programs have propelled CCI to achieve top national rankings in critical areas, including Cybersecurity (ranked in the top 20 for undergraduate cybersecurity degrees by Cyber Security Degrees in 2023), Artificial Intelligence (recognized among the top 10 best online master's programs by MastersInAI.org/Degree Prospects in 2023), Library and Information Science (ranked in the top 15; Information Systems at #4; Digital Librarianship at #5 by U.S. News and World Report in 2021), Computer Science (ranked in the top 40 by College Factual), and Information Science (ranked in the top 10 by College Factual). Additionally, these programs have contributed

to Drexel's inclusion among the top 25 STEM-focused universities in the United States (Forbes, 2018, last year for available data).

CCI's academic programs hold recognition from accrediting agencies such as the Middle States Commission on Higher Education (accrediting all programs), American Library Association (accrediting the MS in Library and Information Science), Commission on Accreditation for Health Informatics and Information Management Education (accrediting the MS in Health Informatics), and ABET (accrediting the BS in Computer Science, BS in Information Systems, and BS in Software Engineering).

In 2018, Drexel University achieved R1 status, denoting "very high research activity," as classified by the Carnegie Classification of Institutions of Higher Education. This prestigious status was reaffirmed in 2021.

Within the Drexel academic landscape, the College of Computing & Informatics (CCI) maintains an impressive and forward-looking research and development (R&D) portfolio. This portfolio encompasses a diverse range of funding sources, including federal grants, corporate sponsorships, and foundation support. CCI's ability to not only attract but also cultivate enduring partnerships with both industry and academic entities stands as a cornerstone of the College's ongoing success.

The major research domains within CCI encompass computer science, computer security, human-centered computing, informatics & data science, library & information science, and systems & software engineering. CCI distinguishes itself by actively collaborating with various units across the University, spanning multiple disciplines. Notable examples of such collaborations include the Isaac L. Auerbach Cybersecurity Institute at Drexel University and the Internet of Things research program.

Within the realm of information and technology (I&T) education and research, CCI aspires to be an industry trendsetter and is widely acknowledged for its innovation. CCI consistently advances I&T education and research initiatives through a comprehensive array of academic programs in computing and information science.

Additionally, CCI remains committed to its focus on scalable, society- and industry-driven R&D and innovation through initiatives like the Corporate Partners Program and Women in Computing.

Through its endeavors, CCI continues to foster meaningful collaborations across the University, serving as a catalyst for regional growth and development. An outstanding example of this approach is the rapidly expanding Corporate Partners Program (CPP), which exemplifies CCI's dedication to driving industry-fueled collaboration and sustainable growth.

II.2. College Snapshot and SWOT Analysis

A concise summary of the high-level SWOT analysis for CCI's College Resources and Infrastructure follows.

| Strengths | Weaknesses | Opportunities | Threats |
|--|---|---|---|
| CCI's college-level structure comprehensively covers key areas such as computer science, cybersecurity, data, and information sciences, fostering University engagement. | Lack of established and streamlined College organization, policies, and processes, hindering integration and synergy between academic programs and sub-disciplines. | CCI is well-positioned to drive integration and interplay among computer science, cybersecurity, data, and information sciences, offering exciting possibilities. | Failure to rally faculty leadership may hinder CCI's strategic potential, leading to missed opportunities for growth and leadership. |
| Renowned Drexel Co-op education model aligned with market needs, contributing to Drexel's recognition among the top 25 STEM institutions by Forbes in 2018. | Insufficient College support systems, alumni relations, and donor base. | The current climate presents an ideal time for computing and informatics, with a high demand for training and talent, especially in programs like Women in Computing. | Budgetary challenges at the University level and a lack of substantial College-level growth could result in long-term struggles and stagnation. |
| Excellent location in the northeastern corridor within a major metropolitan area, facilitating access to new business development and funding opportunities. | High Drexel tuition price point limiting market access, affecting recruitment and retention. | The College can establish overarching industry partnerships through the Corporate Partners Program (CPP), securing regional pre-eminence. | Increased competition from lower-cost and just-in-time alternatives, such as MOOCs and online degree offerings. |
| Respected faculty and professional staff, with strong reputation in selected disciplines, programs, and research. | Limited agility in academic programs to meet rapidly changing market demands. | Opportunities exist to develop large-scale, society-facing R&D initiatives and academic partnerships | Geopolitical tensions may disrupt the College's international strategy. |
| Strengths | Weaknesses | Opportunities | Threats |
| Organizational structure and faculty expertise position the College well to shape | Lack of large-scale, high-impact team research and funding, as well as challenges | CCI has potential for significant growth in professional and graduate education, | Demographic changes and cost pressures pose threats to Drexel's |

| | | | |
|--|-------------------------------|--|--|
| 21st Century C&I education and research. | in scaling academic programs. | international presence, and new academic programs. | traditional regional undergraduate base. |
| | | | Lack of cross-college collaboration and policy incentives may impede progress. |

III. Mission & Vision Statement

Drexel's College of Computing & Informatics (CCI) has a clear mission and vision:

Mission: CCI's mission is to play a pivotal role both regionally and nationally in training the next generation of information and technology leaders and professionals. It aims to conduct cutting-edge research that advances the field of computing and informatics, thereby strengthening our nation's innovation enterprise while contributing to regional development and growth.

Vision: CCI envisions itself as a leader and powerhouse in pioneering 21st Century computing and informatics education and research. By aligning computer science and information science with contemporary societal and economic needs, CCI seeks to revolutionize computing and informatics education, empower faculty to lead groundbreaking research, and foster multidimensional information and technology talent development across disciplines and professions.

To realize this vision, CCI is committed to strategically reshaping its academic programs, promoting sustainable growth to expand its resources and impact, enhancing organizational capacity to engage in society-facing, significant research initiatives, and establishing itself as a vital enabler and partner within the University and the region.

As the digital transformation sweeps across every sector of the economy and society, the importance of computing and informatics has grown significantly in all disciplines. In the previous five-year plan, we strategically prioritized the transformation of CCI from a collection of vertical subdisciplines into an integrated college characterized by seamless connections and synergies between computer science and information science. Our goal was to position CCI as a crucial partner, facilitator, and catalyst not only within Drexel University but also across various industries.

This strategic direction and priority remain highly relevant in the current five-year plan. The successful execution of this priority will play a defining role in shaping CCI's future, including its identity, growth trajectory, reputation, and impact. Furthermore, the broad realization of this vision will help define Drexel's identity, promote its growth, and strengthen its sustainability.

Over the past five years, we have laid the foundation that has propelled the college in this direction. Key building blocks include the composition of our faculty, the deepening integration of Computer Science and Information Science, redefined orientations for our academic programs, increased collaborations between CCI faculty and the broader university community, significantly enhanced engagement with diverse industries, and the establishment of pioneering interdisciplinary programs in collaboration with the LeBow College of Business.

The development of new academic programs in core CCI areas has now reached a stable and mature state, coinciding with the accelerated digital transformation unfolding across various industries, notably driven by recent advancements in artificial intelligence. As Drexel takes significant steps towards ensuring its future sustainability, the time is ripe for our college to expedite the realization of this strategic priority.

IV. Strategic Areas

The strategic objectives outlined in this section are meticulously designed to drive the realization of CCI's vision. These objectives leverage historical market shifts toward an information and technology-driven economy, capitalize on CCI's unique multidisciplinary structure in conjunction with Drexel's advantageous urban location, and directly address challenges while mitigating potential risks.

IV.1 Area 1: Academic Programming & Affairs

In 2018, CCI set the growth of its academic programs as its primary strategic objective. It has since experienced consistent growth in both graduate and undergraduate programs from AY2018-19 to AY2022-23. Over the next five years, CCI seeks to prioritize and sustain this growth model while enhancing student retention and success in both graduate and undergraduate programs.

To achieve these priorities, CCI's Academic Affairs, working closely with the Information Science (IS) and Computer Science (CS) departments, will implement the following operational strategies:

Invest in undergraduate programs and support systems, aiming to improve student success and retention, enhance program diversity, and bolster program reputation while ensuring continued organic growth.

Expand master's-level graduate programs by diversifying academic offerings, creating new degree programs, enhancing the student experience, and providing academic and student support initiatives.

Utilize data and analytics to identify student needs and areas for improvement, ultimately enhancing program reputation, research opportunities, academic resources, and support services.

Through these strategies, CCI aims to cultivate a vibrant and supportive academic community that fosters growth, success, and achievement for its students.

IV.1.1. Growth of Undergraduate and Graduate Programs

Current State

Over the past five years, CCI's undergraduate programs have demonstrated an annual average growth rate of 7.5%. Notably, the Computer Science (CS) program, the largest undergraduate major, has experienced an average annual growth rate of 6.5% since 2018. The Data Science program has shown the most significant growth with an average annual rate of 29.4%. However, other undergraduate programs, including Software Engineering (SE), Computer Security and Technology (CST), and Information Systems (IS), have experienced slower growth during AY2018-19 to AY2022-23.

There has been a slight shift in this trend for the incoming class of first-time, full-time students in Fall 2023-24. Preliminary results indicate stability in the CS program and SE, nearly a 47% increase in DS, and an impressive 85% growth in CST. These growth rates mark positive developments in achieving a more balanced distribution among incoming undergraduate programs. Nevertheless, the size of the CS program relative to other programs has kept the latest growth rate at around 8%.

Like Drexel University, the majority of CCI's undergraduate students are domestic, with 17.1% of CCI's students being international in AY2022-23. Domestic students primarily hail from neighboring states such as Pennsylvania, New Jersey, New York, and Maryland. In Fall 2022-23, underrepresented minorities (URMs) accounted for 9.9% of CCI students.

Graduate enrollment at CCI has shown an average annual growth rate of 9.1% from AY2018-19 to AY2022-23. Some newly established programs, such as Data Science (94.8% average annual growth) and Human-Computer Interaction (HCI) (171.1% average growth), have contributed to this growth. The CS graduate programs have exhibited steady growth with an average rate of 15.5% during this period.

However, certain existing graduate programs, including SE, Information Systems, Library and Information Science, and Health Informatics, have either experienced stagnant or negative growth. Newly launched programs, such as the graduate program in Artificial Intelligence and Machine Learning and Business Information Technology, have also faced slower growth for one to two years.

While international applications to CCI's graduate programs have increased slightly, there has been a minor decline in domestic applications. The graduate-to-undergraduate student ratio has remained stable at approximately 30% over the past three years, with no significant shifts in the number of domestic versus international students in our graduate programs.

Goal

Our overarching goal is to sustain and further enhance enrollment growth across all our academic programs while simultaneously improving the graduate-to-undergraduate student ratio, fostering a diverse student body, and elevating the quality and reputation of all graduate and undergraduate programs within CCI.

Strategy

To accomplish these ambitious goals, we have carefully developed a comprehensive strategy with several key actions:

Faculty and Support Scaling: We will systematically increase the number of full-time CCI faculty members, both Tenure Track and Teaching, while also bolstering departmental-level support structures and college-level Academic Affairs groups, including academic operations, academic advising and student success, and the recruitment team. This initiative aims to accommodate the steady growth of all academic programs while maintaining selectivity and enhancing program diversity and reputation.

Admission Process Enhancement: CCI's Academic Affairs, in close collaboration with the Information Science (IS) and Computer Science (CS) leadership, along with the CCI marketing and communication team, will refine admission processes. This includes the development of innovative yield and anti-melt strategies tailored to different degree programs and modalities, as well as the implementation of country-specific recruitment plans for international students.

Alignment with Market Trends: We will utilize model-based planning to respond effectively to global market and academic research trends in technology. This will ensure our programs remain competitive and relevant in a rapidly evolving computing and information landscape. We will link these activities to curriculum planning and refinement, introducing new learning modules in our modular degree programs and establishing joint multi-disciplinary programs.

Tuition Discounting Policy Evaluation: CCI's Academic Affairs, in collaboration with departmental leadership and CCI's finance group, will conduct a thorough evaluation of our tuition discounting policies. This analysis will be market-driven, with the goal of optimizing enrollment while maximizing net tuition revenue (NTR). To attract high-quality, research-oriented students who contribute to CCI's academic and research missions, we will focus on merit-based fellowships as the foundation for any revisions to the discount model.

Metrics

- a. Student-to-faculty ratio.
- b. Student-to-advisor ratio.
- c. Year-over-year growth: HC, FTE, DEI indicators, % international, corporate partnerships.
- d. Admissions funnel metrics: complete applications, admit rates, yield, and melt.

IV.1.2 Enhance Student Retention and Student Success

Current State

As an academic unit, CCI aims to create a supportive environment for students to progress toward their degrees. Key to evaluating this objective is academic retention, which measures the percentage of a cohort starting an academic year that remains enrolled at the beginning of the following academic year.

Our average annual retention rate for CCI's graduate programs, spanning AY2017-2018 through AY 2021-2022, has been 89% for face-to-face (F2F) programs and 70% for online programs. This indicates a 19% discrepancy between the two modalities. Recent data for the past two years show the F2F annual retention rate has decreased to 86%, while online retention remains steady at 70%.

For CCI's undergraduate programs, the combined average annual retention rate from AY2017-2018 through AY 2021-2022 has been 90%, compared to 88% for the same period. However, CCI's first-year, full-time retention rate for the past two years has decreased to 89%, in contrast to the university's 88% for the same period.

These data highlight the need for improved academic success for both undergraduate and graduate students through proactive advising tailored to individual needs and enhanced educational supports and services. To address this, we established an academic advising and student success unit in 2022 and streamlined PhD services by transitioning program management to Academic Affairs and PhD admissions to the recruiting group.

Goal

Our primary goal within this domain is to significantly enhance academic success for undergraduate and graduate students. This will be achieved by ensuring that all students receive proactive advising based on their individual needs and benefit from improved educational support and services. These measures will contribute to increased retention rates and timely degree completion.

Strategy

To realize CCI's goal of ensuring student success, we will implement the following strategic actions over the next five years:

Holistic Service Model: CCI's Academic Affairs, in collaboration with departments, will develop a comprehensive service model to enhance graduate and undergraduate student retention. This model will focus on providing support services for at-risk students identified through early warning systems. Additionally, it will introduce innovative support services such as individual or small-group tutoring, graduate peer-mentors, and extended academic services supported by TAs, CAs, DAs, and CLC support.

Population-Specific Service Model: CCI's Academic Affairs will transition to a population-specific service model. This involves expanding customized advising practices for online learners and establishing CCI-centric online student/faculty engagement activities. Ensuring accessibility of all CCI services and support systems to campus-based, online, and corporate-partner students will be a top priority.

Benchmarks for Success: Academic Affairs at CCI will establish well-defined benchmarks for success by following best practices for retention. Leveraging existing Drexel technology platforms and expanding the early warning system for at-risk student identification and support will be integral to this process.

Professional Development: CCI's Academic Affairs, with support from college leadership, will continue investing in staff professional development, particularly regarding diversity, equity, and inclusion (DEI) in academic programs. Additionally, CCI leadership will maintain manageable student-to-staff and staff-to-program ratios to promote a high-quality working and educational environment.

Metrics

- a. Retention rates
- b. 6-year graduation rates
- c. Student satisfaction data
- d. Use rates for offered support services

IV.1.3 Program Quality and Operations

Current State

CCI enjoys a diverse portfolio of programs, including seven undergraduate programs, one joint undergraduate program with the LeBow College of Business, nine face-to-face (F2F) graduate MS programs, eleven online graduate master's programs, one joint graduate program with LeBow College of Business, and two PhD programs.

In the past five years, CCI has achieved success in the realm of partnership programs, establishing five corporate partner programs at the MS level solely administered by CCI. Additionally, CCI has supported a 3+2 transfer program with Lanzhou University in China.

Several areas of concern require attention within this plan:

Some undergraduate programs, notably Computer Science and Software Engineering, exhibit high complexity with long chains of prerequisite dependencies extending beyond the first two years of the program. This complexity can challenge students and create planning difficulties for CCI Academic Operations.

Ensuring consistent instructional quality across different programs is a major concern due to the range of program offerings, sections, and students. The lack of coordination and evaluation mechanisms impacts student learning outcomes, satisfaction, and retention.

The current ratio of full-time to adjunct faculty at CCI, both at the undergraduate and graduate levels, is suboptimal for maintaining a strong reputation.

The limited geographic diversity of available students, particularly at the undergraduate level, poses challenges, especially given the anticipated "enrollment cliff" starting in 2025.

Goal

Our goal is to elevate the reputation and quality of all CCI academic programs by implementing enhanced oversight of course content, instructional quality, integrated scholarly activities, and outcome measures.

Strategy

In alignment with our established goals, we will adapt CCI's Academic Operations practice in the following ways:

Program Health and Viability Review: CCI's Academic Affairs, in collaboration with departmental curriculum committees and CCI's marketing and communication team, will develop and implement mechanisms to regularly measure the health, viability, and potential restructuring of individual academic programs. Specific actions include:

Regular review of standalone certificates, which serve as building blocks for degree programs, with a focus on improving enrollments.

Establishment of processes to identify and phase out underperforming programs while planning course and program updates based on reviews of structural complexities and evolving technologies.

Identification of future areas of academic growth and alignment of faculty growth with those areas.

Monitoring of modular programs for viability and alignment within the degree portfolio.

Enhancement of communication plans for prospective and current students to increase understanding and appreciation of modular degree programs.

Operational Collaboration: CCI's Academic Affairs will closely collaborate and coordinate with CCI College Operations to enhance operational and logistical support, including education and research spaces, classroom scheduling, and technological resources.

Course and Program Enhancement: CCI's Academic Affairs, in collaboration with departments, will develop a plan for reviewing and updating course evaluations, course and program

objectives, and managing deficiencies and new program enhancements such as graduate co-ops. Systems and workflows will be established to evaluate the quality of instruction and promote best practices across all CCI programs.

Process Optimization: CCI's Academic Affairs, working with departments and the CCI finance team, will identify Drexel processes negatively impacting CCI priorities, including growth, student outcomes, and student satisfaction. Models will be devised to balance the ratio of full-time and adjunct faculty in all programs, improve academic support, and enhance faculty-to-student and TA/CA support ratios.

Strategic Growth in PhD Programs: CCI's Academic Affairs, in coordination with departments and CCI research operations, will establish strategic objectives for enhancing the PhD program. This includes providing advanced scholarly and academic activities at the graduate level, ensuring all programs have necessary resources to promote excellence in PhD research and scholarship, and investing in graduate education to elevate program reputations and attract top talent.

Metrics

- a. Trend analysis of individual program results: enrollment (HC and FTE), NTR, retention, graduate rates, and enrollment in key courses.
- b. Complexity analysis comparison over time.
- c. Course evaluation results and completion rates.
- d. Operational efficiencies related to course offerings, classroom/facility usage, and event attendance.

IV.1.4. Inter-College Partnerships and New Markets

Current State

Between AY2018-19 and AY2022-23, CCI has increasingly engaged in collaborative efforts with other academic units to create joint academic programs. To date, these efforts have resulted in the establishment of two new programs: one undergraduate (BSECDS) and one graduate (MSBIT) program in partnership with the LeBow College of Business. The MSBIT program has also been a core component of a robust academic collaboration between CCI and Comcast.

Furthermore, CCI has participated in two memoranda of understanding (MOUs) with the College of Arts and Sciences (CoAS), exploring potential joint programs between CCI departments and the psychology department.

Regarding new markets, CCI currently enrolls a relatively small percentage of international students at both the graduate and undergraduate levels. For instance, in the Fall of 2022, the

international percentage for undergraduates was 17.1%, while it stood at 26.7% for our graduate programs. We aspire to increase international student participation in the future.

Over the past five years, CCI has been a partner in two industry-centric programs. Our strategic goal is to enhance CCI's offerings by expanding the number of corporate partners interested in collaborating on academic and research programs. Stronger industry partnerships will ensure that CCI programs align more closely with job market needs. As emphasized in Section IV.3.7 to achieve our growth objective, we aim to create financially viable joint programs that offer students novel and sought-after educational opportunities. Leveraging the strengths of multiple units will enable us to develop comprehensive and interdisciplinary programs.

Goal

Our objective is to identify new partnerships, both within and outside of Drexel University, with the aim of developing sustainable joint programs, attracting high-caliber international students, and engaging potential markets and collaborators. Through these efforts, we aspire to expand the academic offerings of the College of Computing & Informatics (CCI), enhance the diversity of our student body, and establish mutually beneficial relationships with corporate partners and other academic units within Drexel University.

Strategy

Achieving this strategic priority involves the implementation of new initiatives and realignments within CCI, forming strategic partnerships with corporate entities, and coordinating priorities at the university level.

CCI Academic Recruitment: In collaboration with college leadership, our academic recruiting team will formulate strategic initiatives to augment the international student population and elevate the quality of their educational experiences. This will entail restructuring our international recruitment operations and intensifying collaborations with the marketing team to effectively target international markets. Additionally, we will establish partnerships with international institutions to facilitate undergraduate-to-graduate transfers and direct recruitment into our graduate programs.

Direct International Recruitment: CCI's recruiting efforts will encompass an increase in on-the-ground international recruitment activities. We will also evaluate and explore partnerships with recruitment companies, working to develop structured cohorts of international students for CCI.

Interdisciplinary Program Development: We will identify existing curricular components ripe for integration or create innovative programs in collaboration with other colleges and schools within Drexel. These endeavors are expected to yield a substantial portfolio of joint interdisciplinary (and potentially modular) undergraduate and graduate programs, similar to the successful collaborations with the LeBow College of Business on the BS in Economics and Data Science and MS in Business Information Technology.

Academic Engagement with Corporate Partners: CCI's Academic Affairs team, in partnership with departments and the CCI Corporate Partnership team, will devise strategic priorities aimed at strengthening our academic engagement with corporate partners. This entails streamlining academic programs in tandem with industry partners, utilizing modular degree programs, and exploring multi-partner student cohorts to extend our reach and impact within the regional industry landscape. We will concurrently collaborate with multiple partners and academic units to create and deliver joint educational programs that provide diverse opportunities for students. Finally, we will work on the development of potential certificate programs to address workforce reskilling needs.

IV.2 Area 2. Research & Funding

Current State

- a. Since the start of FY 22, 27 out of 40 tenure/tenure-track faculty members have served as the Principal Investigator (PI) for external research expenditures within CCI. Additionally, teaching faculty and faculty emeriti have acted as the PI of record for awards that have significantly contributed to CCI's external research expenditures.
- b. The majority of CCI's PIs for externally funded awards work individually or in very small teams, with few collaborating with more than two CCI peers.
- c. While some CCI faculty members participate in large proposal efforts, few faculty members lead proposal efforts exceeding \$1 million.
- d. Over the past several years, CCI faculty members have invested substantial effort in supporting the development and improvement of academic programs and enrollment growth.
- e. While CCI's research support system efficiently handles transactional aspects of pre-/post-awards and reporting, it lacks the capacity for project development, project management, and other strategic activities.
- f. Despite recent improvements, CCI's research expenditures remain low relative to the number of tenure/tenure-track faculty members and the scale of the college.
- g. A strong organizational mandate, including support and incentives, to foster large-scale research funding has been absent. (Note: "Large-scale" refers to projects and funding where CCI faculty members serve as the PI or key Co-PI with substantial funding and responsibilities.)

Goals

- a. Enhance expectations, incentives, and support systems to stimulate large-scale research and funding within CCI.

- b. Cultivate and sustain a culture that systematically pursues major projects, focusing on bottom-up excellence in niche areas that leverage our existing academic and research strengths.
- c. Encourage internal and external collaborations and dialogues on research among CCI faculty, external research scholars, industry partners, and CCI doctoral students.
- d. Promote and sustain nationally and internationally recognized research and scholarship in niche areas.
- e. Foster a college-wide culture of research

Strategy

- a. Revise the faculty assignment policy and/or practices (See Section IV.3.3) to allow for greater flexibility and time allocation for faculty members to pursue and execute large-scale projects.
- b. Revise the faculty reporting, review, tenure/promotion, and merit raise policies to duly recognize and reward faculty members who undertake and succeed in organizing and leading large-scale funded projects.
- c. Establish a resource pool or bootstrap funding mechanism to provide support for the development of large-scale funding proposals.
- d. Develop the college's capacity to assist faculty members in the development of large-scale research proposals.
- e. Elevate the priority of large-scale funding at the college level.
- f. Establish the college's capability and an effective mechanism for identifying large-scale funding opportunities and supporting the pursuit of such opportunities.
- g. Strategically identify and invest in faculty and research clusters situated at the intersection of computer science, data, and information sciences, fostering synergy, mutual support, and leveraging the strengths of our college, university, and the broader geographic region.
- h. Identify incentives to promote partnerships that facilitate faculty participation within and outside CCI, including collaborations with external partners.
- i. Create a resource pool for the collection of data required for training grants, broader participation initiatives, and other research-related opportunities.
- j. Establish a resource pool to support research project management and post-award transactional activities.

- k. Enhance early-stage faculty development and mentoring, encompassing the entire research life cycle rather than focusing solely on proposal writing.
- l. Facilitate college-wide research seminars to engage established external and internal researchers, promoting priority areas in computing and informatics.
- m. Foster an informal research brainstorming culture through activities such as brown-bag sessions involving faculty, research staff, and doctoral students.

Resources and Support

- a. Provide resources and tools to facilitate the identification of collaborative funding opportunities, including enhanced training in the utilization of Drexel's research networking tools like SciVal.
- b. Identify university resources available to assist in research proposal development.
- c. Offer tools and repositories containing templates, samples, and boilerplates for proposal sections.
- d. Provide services for proposal idea brainstorming.
- e. Offer services for proposal preparation and review.
- f. Support data collection, analysis, and dissemination for training grants, broader impacts required for NSF awards, and other purposes.
- g. Support data collection, analysis, and dissemination for PI, department, and college-level reporting and decision-making.
- h. Enhance post-award tracking and reporting for research expenditures, PhD student support, faculty summer and academic year support, co-op programs, REUs, subcontracts, and other categories.
- i. Provide training and support for research project management.
- j. Enhance support for the payment of participant costs, honoraria, and advisory boards.
- k. Improve support for tracking cost share/match.
- l. Enhance support for collaboration with units outside of the college for research-related activities, such as NDAs, contract negotiations, and support for subcontract preparation and invoicing.
- m. Promote research events for faculty, postdocs, and students, where potential collaborators can be invited to foster a culture of unique expertise niches and to encourage the planning and preparation of large-scale proposals.

Metrics

- a. Track the number of large-scale proposals and funding initiatives led by CCI faculty members.
- b. Monitor CCI research expenditures and overhead yield.
- c. Assess the number of individual PIs initiating new, larger collaborations as a process measure for large-scale research funding.
- d. Record the number of college events dedicated to promoting, planning, and preparing large-scale research proposals as a process measure for large-scale research funding.
- e. Evaluate the number of high-quality, peer-reviewed publications.
- f. Track the number of CCI post-doctoral associates, doctoral-level research associates, undergraduate research associates, and staff positions funded.
- g. Measure the months of faculty summer and academic year time supported by externally funded awards.

IV.3 Area 3: College Operations

IV.3.1 College Staffing and Resources

Current State

Over the past five years, we have successfully executed a comprehensive plan to drive CCI's growth, resulting in significant expansions in college enrollment, net tuition revenue, research expenditures, and fundraising efforts. Despite the university's ongoing financial challenges, characterized by declining revenue and rising expenses, CCI has emerged as the fastest-growing college at Drexel University.

College Headcounts

| Headcounts | 201715 (FY18) | 201815 (FY19) | 201915 (FY20) | 202015 (FY21) | 202115 (FY22) | 202215 (FY23) |
|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Student | 1,685 | 1,860 | 2,147 | 2,222 | 2,402 | 2,509 |
| Faculty (full-time) | 57 | 55 | 59 | 63 | 68 | 71 |
| Staff | 39 | 36 | 42 | 38 | 38 | 38 |
| Faculty (FT) to Student Ratio | 30 | 34 | 36 | 35 | 35 | 35 |

Research Expenditures by Department

| Department | FY18 | FY19 | FY20 | FY21 | FY22 |
|-------------------|-------------|-------------|-------------|-------------|-------------|
| CS | 2,683,544 | 1,911,699 | 1,167,233 | 1,382,359 | 1,369,622 |
| IS | 1,954,541 | 1,141,218 | 1,528,263 | 3,011,114 | 3,968,367 |

| | | | | | |
|--------------------|------------------|------------------|------------------|------------------|------------------|
| Grand Total | 4,638,085 | 3,052,917 | 2,695,496 | 4,393,473 | 5,337,990 |
|--------------------|------------------|------------------|------------------|------------------|------------------|

Resource and Staffing Enhancement

Resource and staffing enhancements for the College of Computing & Informatics (CCI) serve a dual purpose. They not only ensure the seamless continuation of day-to-day operations but also provide the essential foundation for CCI's sustained growth. This encompasses the creation and launch of new academic programs, the management of industry and international partnerships, and the facilitation of various support functions, including marketing, communications, recruitment, and college operations.

Our remarkable track record of growth and relentless advocacy has yielded substantial support and resource allocations from university leadership. Notable among these achievements are the acquisition of a state-of-the-art facility at 3675 Market Street, the addition of new faculty and professional staff positions, all of which bear particular significance given the financial challenges that have beset the university. Through diligent fiscal stewardship, we have measurably and meaningfully bolstered the college's cash flow and operating budget compared to our position five years ago. This financial strength has been pivotal in supporting CCI's ongoing operations and ambitious initiatives.

Nevertheless, it is imperative to acknowledge that the expansion of CCI's faculty, professional staff, leadership, physical space, and infrastructure has not kept pace with the remarkable growth in our college's enrollment, academic offerings, revenue-generating endeavors, industry and international collaborations, and the concurrent augmentation of support functions such as marketing, communications, recruitment, and college operations.

For instance, during the period spanning FY2018 to FY2022, while our enrollment and revenue surged by 42.5% and 21%, respectively, the number of full-time faculty increased by only 19%. Our college's leadership structure and team, though instrumental in managing day-to-day operations, also bear the responsibility of spearheading, initiating, overseeing, and leading the implementation of numerous new initiatives, programs, and endeavors. This central role has placed increasing demands on our leadership team, which remains comparable in size to its composition five years ago. Similarly, the move to 3675 Market Street has witnessed CCI's enrollment grow by nearly 40%, straining our current physical capacity to its limits.

The current state of college staff and resources presents a two-fold situation. While our existing staffing and space allow us to maintain college operations with relative stability, our human capital capacity is increasingly becoming a bottleneck that impedes our ability to explore and capitalize on new opportunities essential for fueling future growth. This challenge must be addressed systematically and sustainably, as the continued growth of CCI holds immense importance for both the future of our college and Drexel University as a whole. There exist ample opportunities for CCI to thrive independently and in collaboration with other colleges and schools within the university, as outlined in this strategic plan.

Goal

Our overarching goal is to identify and execute a comprehensive strategy that enables the expansion and effective management of CCI's human, financial, and infrastructural resources. This strategy should facilitate the sustained growth of CCI across multiple dimensions, including enrollment, revenue generation, academic programming, research, and reputation, all while ensuring the sustainability and strategic direction of this growth.

Strategy

To establish a more stable, predictable, and sustainable state for college staffing and resources, supporting ongoing and sustained growth, we will implement a strategy that encompasses the following:

Selective Growth Prioritization: Recognizing that CCI has numerous growth opportunities across various dimensions and market segments, we must adopt a more selective and strategic approach to our growth path. This approach will enable us to allocate limited resources more efficiently and achieve the desired return on investment (ROI) and impact. These growth priorities are discussed in detail in Section IV.

Enhanced Fiscal Planning and Management: Building upon our significant improvements in revenue forecasting, budgeting, and fiscal management, we will further enhance CCI's position and capability in fiscal planning and management. This includes establishing a well-articulated growth roadmap endorsed by both CCI and university leadership. This roadmap aims to strengthen investments in CCI, increase CCI's financial contributions to the university, clarify growth objectives, resource needs, budgeting, and expenditure management, systematically allocate resources to priority areas as outlined in this plan, and ensure effective cash flow management.

Operational Efficiency and Effectiveness: To accommodate the rapid and sustained growth experienced in recent years, we have already made strides in enhancing operational efficiency. Continued improvements in this domain are imperative for sustaining CCI's growth and impact. Priority areas include organizational efficiency and effectiveness through refining the college's management structure and staffing, streamlining operational processes to eliminate bottlenecks, fostering synergies among distinct groups to break down silos, and promoting an outcome-driven culture within CCI.

Systematic Resource Management: Addressing CCI's resource needs involves the systematic and predictable management of both human and physical capacities. Achieving this state necessitates a clearer understanding and coordination between CCI and Drexel University leadership. In recent years, we have secured university investments to support and sustain CCI's growth and operations. However, the lack of clarity and planning in these investments hampers our ability to plan effectively. Given the multitude of growth opportunities and resource constraints in the coming years, a priority for CCI is to establish a multi-year growth roadmap

endorsed and supported by university leadership. This roadmap should provide a clearer understanding of resource allocation to drive and sustain growth.

IV.3.2 Support System for Stimulating Large-Scale Research and Funding

Current State

In recent years, the College of Computing & Informatics (CCI) has witnessed notable growth in research and funding, particularly in extramural research expenditures. Our CCI faculty has maintained a highly competitive research and funding program, although a majority of awards tend to be individual and small-scale. The influx of tenure-track hires and the expansion of federal funding opportunities related to CCI areas have positioned the College uniquely to experience further growth in expenditures over the next five years. To bolster the reputation and impact of CCI's research endeavors, it is imperative to nurture medium- and large-scale funded research initiatives where CCI faculty assume prominent roles as Principal Investigators (PI) or major Co-PIs. These projects play a pivotal role in establishing CCI faculty leadership in high-impact initiatives, often spanning college or university boundaries. They also secure the resources necessary for expanding the college's research capabilities and capacity while enhancing the university's return on investment (ROI) in research.

Goal

Our goal is to enhance expectations, incentives, and the support system for stimulating the development of large-scale research projects and grant writing within CCI.

Strategies

To encourage the initiation of large-scale research initiatives, we will employ a multi-faceted approach that encompasses various dimensions: faculty incentives and support, financial resources, and operational infrastructure (refer also to the research operations plan).

a. Faculty Development and Support

- i. Identify and promote professional development opportunities for faculty to acquire the skills required to plan, propose, and manage large-scale projects.
- ii. Revise faculty assignment policies and practices (See Section IV.3.3) to provide faculty with the flexibility and time needed to pursue and execute large-scale projects.
- iii. Modify faculty reporting, review, tenure/promotion, and merit raise policies to duly acknowledge and reward faculty members who undertake and succeed in organizing and leading large-scale funded projects.

b. Resource Allocation

- i. Establish a bootstrap funding source to facilitate the development of large-scale proposals.

- c. Operational Infrastructure

- i. Develop the college's capacity to assist faculty in the development of large-scale proposals while maintaining current levels of day-to-day support.

- ii. Establish the college's capability and effective mechanisms for identifying large-scale funding opportunities and supporting the pursuit of such opportunities.

Metrics

- a. Monitor the number of large-scale proposals and funding initiatives led by CCI faculty.

- b. Evaluate CCI research expenditures and overhead yield.

IV.3.3 Faculty Assignment, Reporting, and Review

Current State

CCI's current policies and practices pertaining to faculty assignment, reporting, and review have remained largely unchanged since the college's inception in AY2013-14. However, significant shifts have occurred both locally and nationally, encompassing the landscape of higher education in the United States and conditions at the university and college levels. These changes have led to evolving expectations, opportunities, and challenges for both Drexel and CCI. This presents an opportune moment to review and adjust our college's policies and practices to ensure alignment with new realities, better support our faculty, foster a culture of excellence, and reflect the priorities of both the university and the college.

Goal

During this strategic planning period, we intend to review and potentially revise CCI's practices regarding faculty assignments, reporting, and review in alignment with the following principles and priorities:

- a. Enhancing student retention and success.

- b. Aligning faculty assignments, reporting, and reviews to accurately reflect individual faculty members' interests, strengths, performance, as well as Drexel's and CCI's priorities.

- c. Elevating the expectation of quality teaching, student retention, and establishing a baseline for quality assurance in teaching.

- d. Providing incentives and flexibility for faculty to initiate, pursue, and lead large-scale research funding and projects.

Strategy

In alignment with our established goals, we will adapt CCI's faculty management practices as follows:

a. Student Retention and Success

i. Recognizing the growing importance of student retention and success within Drexel's and CCI's core mission, we will develop a system and process for evidence-based teaching evaluation and quality assurance. This may include collecting data on course management, such as syllabus currency, instructional plans, timely assignment submission, grading, and teaching quality. These data will become an integral part of the annual faculty review. We will also review and enhance the current survey-based teaching evaluation to make it more reliable, balanced, and effective.

b. Individualized Faculty Assignments

i. We will explore and potentially implement a more individualized faculty assignment policy and practice, particularly for post-tenured faculty members. This approach will grant department heads greater flexibility in determining faculty assignments based on individual faculty members' interests, strengths, performance, career paths, and organizational needs. The policy and practice of annual faculty review, merit raises, and promotions will closely align with faculty assignments.

c. Incentives for Large-Scale Research Initiatives

i. As discussed above, success securing and executing large-scale research funding, which often involves multidisciplinary and team-oriented efforts, is critical to the future of CCI's research enterprise, impact, and reputation. We acknowledge that conceiving, organizing, pursuing, and executing such initiatives is time-consuming, often spanning multiple years, and comes with a relatively high risk of failure, necessitating increased administrative and organizational support. To stimulate CCI faculty to undertake these high-impact ventures, we will develop mechanisms within faculty assignment and review that provide incentives, flexibility, support, and recognition for such pursuits.

IV.3.4 Marketing and Communications

Current State

The mission of CCI's Marketing & Communications (M&C) function is to bolster and facilitate the primary objectives of the College. The strategic plan underscores a strong commitment to growth and reputation enhancement, achieved in part through a professional, focused, and

effective marketing and communications operation. Several preparatory measures were taken to position this team for success before the launch of the current CCI strategic plan, including:

- a. Implementation of a new technological infrastructure for project management, social media management, international recruitment, and graphic design.
- b. Adoption of a 12-point "Strategic Areas of Focus" plan, serving as a roadmap for the team's future direction.
- c. Strengthening relationships within the University and College to leverage new assets and opportunities.
- d. Establishment of a new team structure, defining roles and responsibilities to optimize both human talent and technological innovation.

Goal

Our objective is to support and facilitate the College's priority goals as outlined in this strategic plan.

Strategy

Each of the strategies outlined below is interconnected with the others and should be viewed as mutually dependent.

- a. Build upon the successful trial brand positioning for master's degrees and introduce the "Ingenuity at Work" brand across the College and in all marketing and communications efforts.

To reach and engage both new and existing audiences, as well as enhance the College's reputation with targeted stakeholders, it is imperative to establish a clear, distinctive, and compelling brand positioning. The brand, which was softly launched with graduate programs in Fall 2022, will be carefully and assertively introduced to the CCI community, the University as a whole, and all other audiences through our various communication channels, with particular emphasis on the CCI website. This brand positioning, along with its supporting proof points, will serve as the cornerstone for all marketing and communications efforts.

- b. Undertake a comprehensive renewal of the CCI website.

As the central marketing asset of the College, the website must prominently and comprehensively showcase the College's distinguished educational, professional, and research offerings. The revitalization of the CCI website will focus on visual storytelling rather than lengthy narratives, highlighting co-op and experiential learning, faculty achievements, student and faculty research, Diversity, Equity, and Inclusion initiatives,

and corporate partnerships that provide opportunities for CCI students. This content will be designed to enhance search engine optimization (SEO) efforts.

Synchronizing the website with social media outreach, advertising, recruitment communications, and all other communication and marketing strategies, while implementing an integrated data collection and analysis strategy, will be critical to assessing effectiveness and making necessary adjustments.

c. Develop a data-driven marketing plan to enhance the effectiveness of the current recruitment marketing strategy.

In collaboration with CCI's Recruitment Team, we will evaluate existing recruitment marketing and communication strategies and recommend new or modified approaches. Key target audiences for prospective students will include international students, corporate/industry employers, working professionals, and other potential graduate students and undergraduates. The plan will rely on historical application and enrollment data, as well as real-time insights into emerging trends in prospective students' college search and social media behavior.

d. Create a brand awareness communications plan to elevate CCI's reputation and research profile by targeting faculty peers nationally and globally, as well as industry leaders through regular communications.

CCI has a compelling story to tell about the innovation and productivity of its research activities and the achievements of its faculty and staff. Expanding the website's real estate dedicated to faculty and research will be a key asset to support all other communication tactics. These tactics may include the development and execution of regular communications to faculty at peer and aspirational institutions, select corporate and grant-making entities, a regional/national advertising campaign, and increased digital media coverage to amplify the faculty's voice.

e. Continually expand CCI's alumni engagement communications plan.

CCI boasts a sizable, accomplished alumni community eager to become more involved with the College. Keeping these alumni informed of the College's activities and accomplishments is essential, as is actively engaging them in promoting the College through participation in events, interviews for the website, and other communication channels. Additionally, promoting their individual professional achievements through various forms of earned media is crucial.

Prior to the new strategic plan, CCI initiated an alumni newsletter that received positive feedback. We intend to expand this offering and explore additional avenues for involving alumni actively in the College's marketing and communication initiatives.

Resources

In an environment constrained by various factors, maintaining a sharp focus on priorities, collaboration, and the optimal allocation of limited resources, both human and otherwise, is crucial. Striking a delicate balance between day-to-day demands and the long-term execution of our strategic vision is an ongoing challenge.

We will continue to prioritize the prudent management of all our assets to achieve our marketing and communication goals.

Metrics

An operational, tactical plan has been developed for each of the strategies discussed above. Each tactic in this plan includes metrics suitable for its evaluation. The success of each tactic will be assessed in terms of its individual performance and its contribution to the overall success of the strategy it was designed to advance.

IV.3.5 Diversity, Equity, and Inclusion (DEI)

Current State

At CCI, our guiding principles of diversity, equity, and inclusion (DEI) are governed by our mission and vision. The College places a high priority on attracting and retaining a diverse community of students, faculty, and professional staff. Through a supportive and inclusive learning and working environment, we aim to cultivate a culture of inclusion and belonging for all members of our community.

a. CCI has witnessed a growing diversity in its student population, and ongoing efforts are dedicated to diversifying faculty and professional staff roles. As the college expands, our student body becomes more diverse, although there are still underrepresented communities. The successful Women in Tech (WiT) program has contributed significantly to this growth and diversification. While our faculty and professional staff have also become more diverse, there remains work to be done to align faculty diversity with that of our students.

b. In the academic year 2022-23, a new Diversity in Tech (DiT) working group was initiated, organized into several sub-groups with designated leads and specific goals (details provided in subsequent sections). Given the critical role of CCI's Leadership Team in the success of this initiative, it is imperative to clarify the Leadership Team's involvement in the administration of DiT.

We aim to continue discussions about the role of the Women in Tech (WiT) initiative within the broader Diversity in Tech (DiT) framework. While WiT has evolved from being the core DEI program to a key priority under the Diversity in Tech umbrella, this transition provides an opportunity to further expand the WiT initiative while establishing a foundation and framework for the broader Diversity in Tech program.

The newly developed National Science Foundation (NSF) Broadening Participation in Computing (BPC) plan needs to be seamlessly integrated into the college's Diversity in Tech plan. The BPC plan not only plays a crucial role in faculty grant proposals and meets NSF requirements but also offers a metric-driven framework for quantitatively measuring CCI's progress in DEI goals (details provided in subsequent sections).

c. The role of the CCI Diversity Officer and other DEI leadership positions is not confined to standalone responsibilities but is integrated into their existing roles. Across Drexel's central administration, colleges, and departments, a consistent model for the role of the Diversity Officer or other DEI leadership positions has yet to be established. This lack of a central model adds an administrative burden on CCI faculty and professional staff.

d. The CCI Diversity, Equity, and Inclusion (DEI) Council, established in 2020, comprises volunteer CCI students, faculty, and professional staff members. While the Council serves as a cornerstone for DEI work, its volunteer-based nature limits its capacity. As the college grows and its student population diversifies, additional support is needed to sustain and scale this model effectively.

e. Within CCI, pockets of engagement and commitment to DEI issues among faculty and professional staff have emerged. Although slow, there is observable positive cultural change, primarily qualitative, but lacking quantitative data. Since 2020, there have been notable shifts in CCI's culture and climate. While individual leadership in this area has been evident, formal culture-focused efforts were only initiated in 2020. Establishing quantitative goals and metrics would provide more tangible evidence and support for measurable improvement.

f. CCI actively collaborates and builds relationships across the campus. The college is engaged in the pilot phase of Drexel's Anti-Racism Task Force (ARTF) Commitments. The Diversity Officer is involved with the DEI Academic Leads Council, led by the Vice Provost of DEI, and the Drexel DEI Partners, led by the Office of Equity and Inclusive Culture. Over time, CCI has emerged as a lead unit committed to DEI efforts at Drexel, maintaining consistent engagement, messaging, and representation with key Drexel stakeholders.

Goal

Our goal is to support CCI's overarching objectives, as outlined in its strategic plan, with a particular focus on fostering and supporting diversity, equity, inclusion, and belonging across the College. Concentrating on key areas, as detailed below, to support our prospective and current students, faculty, and professional staff will contribute to an inclusive environment that provides opportunities for growth and achievement throughout the organization and with our partners.

Strategy

a. Diversity in Tech Plan: CCI's Diversity in Tech Plan serves as a comprehensive framework to promote and support diversity, equity, inclusion, and belonging across the College. This plan also emphasizes specific areas that bolster our students, faculty, and professional staff, including fundraising, outreach and recruitment, retention and student success, mentoring and professional development, doctoral recruitment and retention, culture and climate, as well as marketing and communications. Fostering an inclusive environment opens avenues for growth and achievement throughout the organization.

Fundraising: Fundraising plays a pivotal role in CCI's Diversity in Tech (DiT) efforts. The primary objective of fundraising is to secure philanthropic resources to support a comprehensive DiT initiative for the College.

Priorities:

- i. Initiate prospecting for Diversity in Tech supporters, conducting research, ratings, and qualification visits
- ii. Launch an annual fund appeal, sent in November 2022 to CCI alumni, highlighting the DiT initiative and its need for support.
- iii. Develop a case for support targeting Women in Tech donors to encourage their support for Diversity in Tech, emphasizing their alignment as part of the same initiative.

b. Recruitment: The DiT recruitment effort aligns with CCI's recruitment team's current strategy. The overarching goal is to build relationships with targeted pipeline schools.

Priorities:

- i. Commence relationship-building with selected pipeline schools.
- ii. Develop a mission statement for the WiT/DiT Scholarship.
- iii. Increase yield for diverse populations through engagement events.
- iv. Reduce the attrition rate of confirmed diverse students through mentorship, engagement, and inclusive messaging.

c. Retention and Student Success: The focus here is on creating and supporting existing programs and initiatives that help students adapt and succeed in a university learning environment.

Priorities:

- i. Utilize the Gateway Initiative/Early Warning System to identify and support at-risk students on a quarterly basis.

- ii. Establish and implement an Early Warning System for graduate students to identify at-risk students and enhance first-year retention for both face-to-face and online students.

d. Mentoring and Professional Development: This program aims to connect students with industry mentors as they learn to articulate and pursue their academic and career goals effectively.

Priorities:

- i. Expand the mentoring pilot initiated in collaboration with Johnson & Johnson and Drexel's College of Arts and Sciences in AY22-23 to include the Dean's Executive Advisory Council and CCI Corporate Partners in AY23-24.

- ii. Collaborate with the DEI Council to provide faculty and professional staff with training on best practices for working with minoritized students.

e. PhD Pipeline: Increasing the diversity of the CCI PhD cohort involves three key steps: informing potential candidates about the PhD opportunities at CCI, providing incentives for them to choose CCI upon acceptance, and offering support systems to ensure their success and retention while studying at CCI.

Priorities:

- i. Establish a funding pipeline, which may include fellowships or scholarships, in addition to grants.

- ii. Utilize the NSF BPC plan as a guiding framework to expand the PhD pipeline by department.

f. Culture & Climate: The DEI Council serves as the foundation for a culture of diversity, equity, inclusion, and belonging at CCI.

Priorities:

- i. Under the leadership of the DEI Council, continue to focus on educational and community-based programming to promote inclusion and belonging. This includes events, a social media plan/presence, and consistent communication through mediums like the DEI Council's monthly newsletter.
- b. With support from the University, develop a college-wide education/training plan tailored to different populations, including students, faculty, and professional staff. This plan will equip them with the necessary skills to influence culture and climate, fostering a sense of inclusion, belonging, and equity.

a. This initiative is already underway for student employees in CCI and will be expanded to all student leaders to ensure consistent communication of DEI priorities and educational values.

b. Special attention will be given to faculty and inclusive instructional pedagogies. c. Create and launch a climate survey or a similar tool to gather input and track progress across different populations. Drexel's second climate survey, scheduled for Fall 2023, presents an opportunity for CCI to collaborate with the Office of Equity and Inclusive Culture on a pilot climate survey.

g. Marketing and Communications: Robust marketing efforts will be vital for the success of the Diversity in Tech initiative, necessitating collaboration with CCI's Marketing and Communications team.

Priorities:

i. Incorporate DEI themes throughout the website and social media platforms, when relevant, including refreshing the DiT (WiT) website.

ii. Support fundraising efforts led by the Dean and Institutional Advancement through website, social media, and content.

iii. Aid in the solicitation of industry mentors through communication. d. Develop a comprehensive communications plan for DEI initiatives, including event/program support and general education.

iv. Resources/Support

It is imperative for the college to consider the expanding scope and impact of DEI initiatives at CCI and Drexel and adjust human capital and support systems accordingly. The initial step is to establish a formal budget for CCI's DEI initiatives. Other objectives include:

Developing a plan for cross-functional organizational support for DEI initiatives, including the Leadership Team. The NSF BPC plan and the Diversity in Tech initiative are extensive organizational undertakings that require faculty, professional staff, and the Leadership Team's involvement. A facilitation and support framework should be developed.

Increasing faculty engagement in groups like the DEI Council, including the appointment of a co-chair. Faculty participation on the DEI Council, which became part of faculty governance in AY22-23, will be further evaluated for formal opportunities to enhance faculty leadership and participation. DEI faculty leaders can exert a significant influence on their peers.

Establishing a DEI Dean's Fellows Program to make formal assignments supporting college DEI, Diversity in Tech, and Women in Tech initiatives. Fellows would apply for these roles and represent students, faculty, and professional staff. These positions would be formally assigned to projects that advance CCI's DEI initiatives and come with a stipend.

Metrics

Establishing DEI metrics is crucial, encompassing both quantitative (to be determined) and qualitative measures. HR data will be used to track faculty and professional staff recruitment and retention. Enrollment data will help monitor the recruitment and retention of diverse and underrepresented student communities. Additionally, a climate survey will measure levels of inclusion and belonging among CCI's students, faculty, and professional staff. Ongoing qualitative feedback from the college community regarding CCI's culture is essential to assess progress.

IV.3.6 Industry Partnerships

The CCI Corporate Partners Program (CPP), launched in 2017, serves three primary objectives:

Foster Large-Scale Industry Partnerships: CPP aims to cultivate substantial partnerships with industry leaders.

Complement Drexel's Successful Cooperative Education Model: It complements Drexel's well-established and thriving cooperative education model.

Expand Talent Development and Recruitment Opportunities: The program seeks to broaden talent development and recruitment avenues for both students and industry partners.

CPP necessitates both a sponsorship and partnership commitment from industry collaborators. It establishes comprehensive programming to involve the industry in CCI curriculum and teaching, provides professional development opportunities for CCI students, facilitates capstone projects, and conducts marketing and promotional activities to enhance brand awareness. Additionally, the program offers engagement avenues for partners to interact with CCI students and faculty through various networking events and activities.

This program delivers multifaceted value to both the College and the University. The continued success of CPP will solidify Drexel and CCI's position as the foremost talent provider in the region. It will enhance the market competitiveness of CCI students, secure enduring industry support for education and talent development at Drexel, and create a platform for expanding CCI's graduate and professional training programs.

Current State

- a. CCI has made significant strides in positioning itself as the premier magnet for the industry, serving as the foremost provider of tech talent not only for the local region but

also on a broader scale. Since the inception of CPP in 2017, CCI has established strategic partnerships with a diverse array of organizations, ranging from dynamic startups to Fortune 500 giants. At present, CCI proudly boasts 40 corporate partners. In the autumn of 2021, we made a strategic shift from a fee-based model to an engagement-based approach. This transformation has been met with an overwhelmingly positive response from the industry, leading to a substantial increase in our partner network throughout 2022-2023. We remain committed to nurturing new collaborations while solidifying existing partnerships.

b. Our efforts have culminated in the establishment of robust industry alliances dedicated to talent development and pipeline expansion through CPP. Programs such as the Senior Project, along with signature events like Career Networking sessions and the prestigious Philly Codefest hackathon, have significantly amplified access to talent development opportunities and professional roles for both companies and our students. Furthermore, CCI has deepened its collaboration with the Steinbright Career Development Center through enhanced communication and joint initiatives. Our next strategic thrust is to expand our rapport with CCI alumni occupying senior positions within companies, thereby broadening our partner network and augmenting the talent pipeline.

c. We have successfully conceived and implemented innovative, high-impact industry partnerships with industry titans like DXC and Comcast. These collaborations were initially rooted in academic programming, responding to companies' needs for upskilling and reskilling to meet the surging demand for tech talent and to stay abreast of emerging technologies. An exemplar of such a partnership is Comcast, serving as a paradigm for prospective collaborators. The Comcast collaboration is multifaceted and scalable. This academic partnership has organically evolved into college-wide engagement. Notable instances include their prestigious title sponsorship of Philly Codefest, an exclusive recruitment day for CCI students, and a synergistic association with the Women in Cable and Telecommunications (WiCT) group. The latter works in tandem with CCI's Diversity, Equity, and Inclusion (DEI) Council to champion women in tech and foster diversity within the tech sector.

d. We have instituted all-encompassing industry engagements, stemming from the aforementioned initiatives and facilitated by the CCI Dean's Advisory Council (DEAC). Distinguished C-suite executives and other corporate leaders, who concurrently serve as DEAC members, often transition into active participants in the Corporate Partners Program due to the value they discern in their relationship with CCI and the caliber of talent within our ecosystem. CCI, in turn, benefits immensely from the thought leadership of these DEAC members, as well as their proactive involvement with CPP. The DEAC, as a collective, shares their invaluable industry insights, which directly shape our curriculum development in real-time, particularly for our professional degree programs.

Goals

- a. Increase the Number and Diversity of CCI Industry Partnerships: Our objective is to continue expanding the quantity and diversity of industry partnerships within CCI, solidifying our reputation as the preferred destination for talent and innovation across various sectors. The relaunch of CPP in fall 2023 has significantly broadened its reach, encompassing not only traditional tech companies but also those in sectors like healthcare, sports, and both domestic and international partners. To achieve this, we will diversify our portfolio by leveraging our existing network and cultivating new leads and contacts through our program offerings and access to tech talent.
- b. Expand Purpose-Driven Industry Partnerships: Our goal is to systematically expand purpose-driven industry partnerships that deliver measurable ROI in terms of revenue, funding, reputation, and impact. CCI's role as the primary provider of tech talent in the region continues to grow, transcending the tech industry into other sectors. Our CPP programming caters to both industry and student needs, offering companies access to intellectual capital, including students, faculty, and research, while providing our students with valuable hands-on experiences in tech and emerging industries.

Strategy

- a. Elevate CPP's Scale, Substance, and Impact: We aim to elevate CPP to a higher level of scale, substance, and impact. Through Drexel partnerships with Steinbright and Drexel Solutions Institute, coupled with external collaborations with organizations such as the Science Center and other regional leaders, CCI is expanding its influence and establishing expertise as the go-to resource for tech talent in the Greater Philadelphia region. CPP is developing a plan to establish an academic advisory board with select partners, allowing them to share industry needs and requirements to inform our curriculum planning.
- b. Establish Multiple Comcast-Like Partnerships: We intend to build multiple partnerships akin to the successful model with Comcast. This approach will provide stability, scale of enrollment, revenue growth, and position CCI as a recognized leader in workforce reskilling and upskilling. The well-established academic model with Comcast can be adapted for other large companies. Additionally, we are exploring cohort models that allow smaller companies to collaborate in educating their workforce collectively.
- c. Energize Industry-Sponsored R&D Partnerships: We will focus on invigorating our industry-sponsored research and development partnerships. We aim to align some of these partnerships with our pursuit of large-scale federal funding opportunities and vice versa.
- d. Integrate Industry Relationship Development with CCI Priorities: The Comcast partnership serves as a model for cross-functional relationships that impact various CCI priority areas. We are also considering a tailored approach for smaller companies

interested in forming cohorts. Furthermore, we are exploring the possibility of hosting an annual forum for our current corporate partners, providing a platform for them to share insights that may influence our recruitment, curriculum, and research/funding efforts.

Metrics

Success in the Corporate Partners Program will be assessed by measuring the number of partners and the depth of their engagement with CCI. Tracking co-op and employment data for graduates will be essential, as CCI remains the primary tech talent provider in the region. Comcast's academic partnership will serve as a model for building new relationships and corporate student cohorts. Continuous feedback from companies and employee satisfaction data will be critical for program success.

IV.3.7 Inter-College Partnerships and CCI's Role at Drexel

Current State

As noted earlier, and at length, in the “Mission & Vision” section of this plan, CCI has worked diligently to respond to both the rapidly changing nature of work and life that has been propelled by technology and to Drexel's imperative as a university to respond as well. Our last strategic plan positioned the College to contribute uniquely and at a large scale to Drexel's mission to change as an institution to match the ways in which the world is changing.

As the digital transformation sweeps across every sector of the economy and society at large, the relevance of computing and informatics has become increasingly pronounced across all disciplines. In the previous five-year plan, we strategically prioritized the transformation of CCI from a collection of vertical subdisciplines into an integrated college characterized by seamless crossroads and synergies between computer science and information science. Our aim was to position CCI as a pivotal partner, enabler, and catalyst not only within Drexel University but also across various industries.

Goal

There are potentially four major goals to achieve. Success in any of these endeavors will yield profound benefits, while comprehensive success will have transformative effects on CCI and Drexel as a whole.

Design and implement a university-wide curriculum that equips every Drexel student with robust knowledge and skills pertaining to the digital economy. Our Drexel TechForce proposal, in need of revision and updating, offers a blueprint for this initiative.

Cultivate extensive partnerships with other colleges and schools to create and launch a substantial portfolio of interdisciplinary programs. Notable examples include the BS in Economics and Data Science and the MS in Business Information Technology, which we successfully launched in collaboration with the Lebow College of Business.

Foster broad information and technology-enabled or -driven interdisciplinary research and development funding, with a particular emphasis on large-scale research endeavors involving CCI faculty in leadership or major roles.

Continue expanding CCI's outreach to industry partners and establish CCI as the premier destination for talent and innovation in the region. While we have made significant strides in forging industry talent partnerships in recent years, significant untapped opportunities remain.

Strategy

The realization of this strategic priority encompasses several components, including CCI's role, university-level priority setting, consensus building, and subsequent action. Additionally, several complex balancing acts and challenges must be addressed and overcome.

We will explore the feasibility of collaborating with the Provost's Office and the broader Drexel community to develop a plan for an Information and Technology (I&T) curriculum aimed at equipping every Drexel undergraduate student with essential competencies in the digital economy. The feasibility and implementation of such a curriculum hinge on university-wide decisions regarding the adoption of a core curriculum.

We will chart a multi-year roadmap to design and launch a portfolio of graduate-level computing and informatics academic programs that are inter-college and interdisciplinary in nature.

We will systematically expand research and funding collaborations with other colleges and schools, with a special focus on pursuing large-scale funding opportunities in alignment with the priority outlined in Section II.

We will embark on an ambitious expansion of our comprehensive industry partnership program. This program aims to create an ecosystem that enhances tech talent development across diverse industries, expand large-scale partnerships similar to our successful collaboration with Comcast, and explore and expand industry partnerships in research and development, particularly those aligned with federal funding priorities.

To effectively develop and implement plans in the aforementioned areas, we must also address several key challenges:

Balancing development with capacity: After several years of continuous and robust growth, CCI's capacity is facing challenges. Collaborative efforts with university leadership are required to establish a sustainable approach to address this issue.

Managing an expanding academic program portfolio: As we explore new opportunities, managing the existing academic program portfolio becomes increasingly challenging. This includes maintaining program clarity, identity, economies of scale, effective marketing, communication, recruitment, and support system management.

Transforming the university's business model: Successfully implementing interdisciplinary programs at scale necessitates substantial changes in the university's business model, encompassing governance, processes, communication, coordination, and staffing. Effective university-level communication and marketing are essential to raise awareness and garner support for these programs among prospective students and partners.

Building consensus and prioritization: Broader consensus, support, agreement, and prioritization from university leadership and peers across the institution are vital to the successful implementation of our vision on a wide scale and scope.

IV.3.8 Future Organization of CCI

Current State

In the past five years, CCI has experienced sustained growth across all operational facets, encompassing academic programs, research endeavors, enrollment figures, faculty, and staff. CCI's evolution from a relatively modest unit to an increasingly influential presence within Drexel, as well as a substantial contributor to the regional talent pool, is undeniable. The College consistently ranks among the University's fastest-growing units. Given the centrality of the domains served by CCI in driving social transformation and economic prosperity, this expansion is poised to persist. As our footprint has expanded, our organizational and managerial structure has undergone minor adaptations to accommodate this growth. Sustaining our ongoing success hinges on maintaining a robust organizational framework capable of effectively supporting a larger, more diversified CCI.

Goal

Our primary goal is to formulate an informed, actionable, and practical roadmap delineating CCI's future scope, focus, organizational structure, management practices, and staffing requirements. This roadmap should serve as the foundation for guiding CCI's continued development, growth, and impact.

Strategies

We will establish a CCI Futures taskforce tasked with evaluating potential organizational changes and offering recommendations to address the following key areas:

- a. College Structure: The taskforce will explore several structural development possibilities. These may include the continuation of our existing college structure with ongoing adjustments to accommodate expansion, the incorporation of new academic department(s), or the reevaluation of the current departmental framework.
- b. Leadership Structure and Management: An examination of the structure and allocation of responsibilities related to the management of activities within academic departments, as well as the coordination of activities across these departments and

external engagements, will be conducted in conjunction with the assessment of departmental structure.

c. Orientation, Scope, and Key Focus Areas: The present composition of CCI has evolved, influenced both by past constituent groups and the evolving landscape of market demand and hiring trends. A comprehensive review and assessment of CCI's character are imperative, not merely to facilitate growth, but to strategically position ourselves for deliberate and purposeful growth in line with our mission and vision.

V. Conclusion

As we recognize our tremendous growth since the creation of the College of Computing & Informatics ten years ago, this plan identifies our strategic objectives, priorities and strategies for CCI for the next five years to achieve even more growth and better align with the transformative roles of I&T in the modern economy. This plan represents a roadmap for the College to advance its core missions in education and research, to serve as a key growth engine for the University, and to help support University-wide growth and advancement. The plan calls for a major expansion of CCI in the next five years, not only in scale, but also in identity, competitiveness and impact, to position the College as a pillar in support of the economic growth of the region and beyond.

This document also represents a living plan for the College. We will continue to develop and adjust operational and implementation strategies in accordance with the priorities set forth in this plan. Each year, we will assess our progress, evaluate major developments internally and externally, and adjust our priorities, strategies and implementations as necessary.