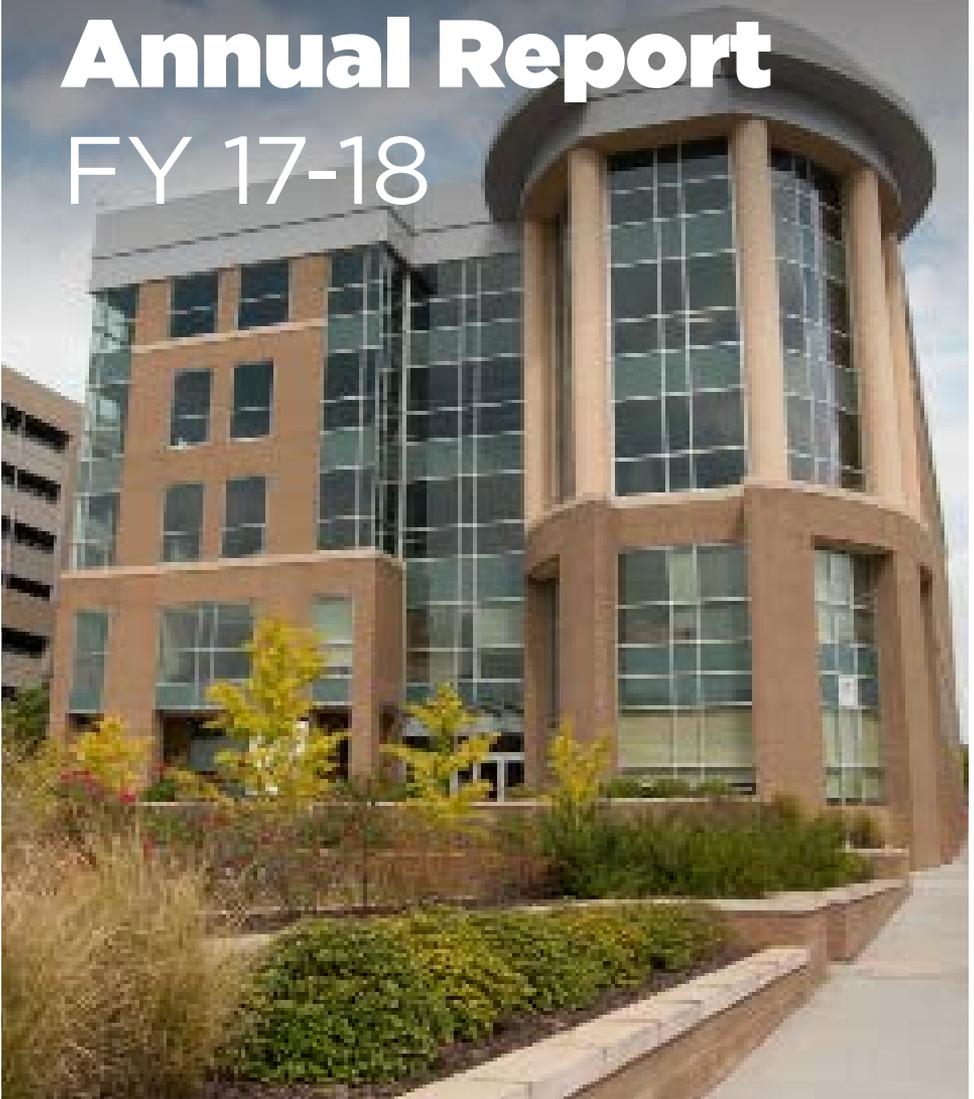


**Division of Information Technology  
University of South Carolina**

# **Annual Report**

**FY 17-18**





**“I appreciate the Division of IT.** “The Carolina Tech Zone was extremely helpful when my laptop abruptly gave out around the beginning of last school year. The staff tried everything to accommodate me, but unfortunately, my laptop was a goner. It was a time of distress, but their great customer service made everything more comforting.”

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**Emery Smith,** Irmo, South Carolina  
Advertising major

# Message from the **Vice President for Information Technology and Chief Information Officer**

I am pleased to share this annual report, which highlights some of the accomplishments of the Division of Information Technology (DoIT) during the 2017-18 academic year. Technology is imperative to the success of the University of South Carolina. It is interwoven in the teaching, learning, and research missions of the university. Over the past year, our division has worked to improve our operations and customer satisfaction. We introduced several new services and restructured our division leadership positions to improve our efficiency, communications, and effectiveness. Our constant goal is to provide quality services that are consistent, reliable, and repeatable.



During my first year as Chief Information Officer, I discovered that not only is the weather in South Carolina unbelievably pleasant, so are the people. The university is filled with highly-qualified and hardworking individuals. Professionals across all campuses are dedicated to improving our university and our direct impact on the state of South Carolina. Employees in the IT field understand that the services we provide are critical to the productivity of the university and take the responsibility seriously. To that end, we will continue to seek ways to improve our division and value the feedback we receive from you. I encourage you to share your questions and concerns with me as we continue on this journey of service improvement.

I am excited to be a part of continually improving services to the university. Thank you for welcoming me and making my first year in South Carolina an exciting one. I look forward to our future partnerships.

Go Gamecocks!

Doug Foster

Vice President for Information Technology and Chief Information Officer

# Security Enhancements

Protecting university resources and data is a top priority. Over the past year, a number of tools were deployed to better secure the technology infrastructure.

## Multifactor Authentication

The university took a huge step toward improving data security by implementing Multifactor Authentication (MFA) across the eight-campus system in June 2017. More than 75,000 students, faculty, employees, and affiliates began using MFA, powered by Duo Security, to login to programs that store personally identifiable information. MFA requires individuals to take an extra step to confirm their identity and adds an additional layer of protection to accounts and the data stored by the university. Users must acknowledge an alert, which is sent to a separate device such as a landline or mobile phone, to complete the login process. It prevents an intruder from logging into an account, even if they have an employee's Network Username and password.



## New Virtual Private Network

A new, more secure Virtual Private Network (VPN) was introduced in 2017. Students and employees use the VPN for secure access to university resources, including shared drives, databases, and select systems when they are away from campus. The new Cisco AnyConnect VPN includes the support of newer operating systems, easier use for Linux and Mac users, the ability to accommodate 10 times more users than the previous system, and improved security.

## University Data Center Security

Security measures regarding the university data center were implemented, resulting in fewer individuals gaining access to sensitive data and machines. The new procedures, along with cameras and secure server racks ensure that access to university equipment is secured 24 hours a day.

## **IT Security Awareness Program**

In order to increase knowledge regarding safe computing practices and awareness of cyber threats, SANS Securing the Human Awareness Training program was implemented. New faculty and staff are required to complete this security awareness training program during the employee onboarding process. The training is video-based and delivered online. Each of the video modules focuses on a specific security topic and concludes with a short quiz to test comprehension. Employees must successfully pass the quiz to proceed to the next video. Reviews of the program have been extremely favorable and employees have indicated that IT security awareness increased as a result of completing the program.

## **SPAM Filter and Identity Protection**

According to Identity Fraud: Fraud Enters a New Era of Complexity from Javelin Strategy & Research, more than 16.7 millions individuals were the victims of identity fraud in 2017. In an effort to reduce the likelihood of data breaches the university rolled-out Spirion Identity Finder to assist faculty, staff, and organizational units identify and remediate sensitive data on computers and servers. After scanning machines for sensitive information, the software prompts the user to take action by deleting or protecting the data. The software is available for employees at all eight campuses for both professional and in-home use.

FireEye Email Threat Prevention was deployed to protect more than 14,000 end-point devices. It monitors student email attacks by filtering inbound email and attachments for SPAM viruses, phishing, policy violations, and other threats. Last year, more than 202,000 computer viruses were detected.





# Advancing Research and Academics

## New Research Cluster

The Research Cyberinfrastructure (RCI) department works with researchers on computational projects requiring high performance computing (HPC) that is critical to the research mission of the university by helping maximize research productivity. RCI helps enhance networking, sharing of data and collaboration with researchers across the globe.

Hyperion, a 300 TeraFLOP HPC cluster was brought online in FY 2017-18. The cluster improved scientific and research computing resources across campus, providing 15 times more hardware and 30 times more performance. It expanded computational resource capabilities from 500 to 6,760 compute cores. This is a large win for advancing research initiatives across the system.

## Seminars and Partnerships

RCI hosted a number of seminars that brought researchers together to discuss topics such as the Linux computing environment, Python and iPython programming, and cluster job scheduling and management. We also hosted the second Symposium on Research Computing to increase awareness of campus-wide needs for research at the university. More than 100 attendees heard presentations and participated in discussions regarding high performance computing, specialized software applications and storage, and archival/curation of data.



**Hyperion**, a 300 TeraFLOP high performance computing research cluster was brought online in 2017. It provides 15 times more hardware and 30 times more performance than previously available and offers both dedicated resources to research groups and shared resources to the community.

We partnered with IBM, who donated an OpenPOWER server to the HPC environment. The OpenPOWER server is powered by an IBM Power-8 CPU supporting up to 160 concurrent threads. Additionally, two high-end GPUs communicate with the CPU over high-speed NV-LINK connections that significantly increases throughput for GPU-intense applications. Tightly integrated into the platform, IBM's PowerAI suite of applications provides a robust research and development environment for USC faculty and students.

In addition, Nvidia helped expand our virtual reality capabilities through the donation of a P-100 GPU with 16 GB memory and 6,000 GPU cores for compute-intense calculations. They also donated three M-6000 GPUs each with 24 GB memory and 3,072 GPU cores.

In partnership with the Center for Teaching Excellence, several other workshops and interactive sessions were aimed to improve the teaching and learning environment. In April, the first Educational Technology Showcase was held to spotlight the latest technology used by higher education instructors. Faculty and experts from around the country gave presentations on how they creatively use technology inside and outside of their classrooms to improve student success and learning.

## **Data Center Capacity Expansion**

To address the need for greater capacity of the university data center, the division began researching plans that will leverage a combination of on-site storage and cloud storage. Discussions regarding cloud storage are underway with Amazon, Google, and Microsoft. The combination of on-site and cloud storage will improve stability, security, and predictability of the data center.

## University-wide MATLAB and Qualtrics Licenses

Many faculty, staff, and student researchers across the university system use MATLAB, a high-level language for scientific and engineering computing. MATLAB is the world's most natural way to express computational mathematics.

Faculty researchers across the university system use MATLAB for teaching, research, and project-based learning. The high-performance language for technical computing integrates computation, visualization, and programming in an easy-to-use environment that allows students exposure to a tool that is used in the commercial world.

The software is expensive when purchased for individual use. As a result, many researchers were previously unable to utilize this beneficial language in their work. Through a partnership with several colleges, departments, and researchers across the system, we were able to offer university-wide licenses to MATLAB, Simulink, and companion toolboxes at no cost.

Dr. Subrahmanyam Bulusu, professor of satellite oceanography and physical oceanography, said, "MATLAB allows students exposure to a powerful tool they will likely encounter in the scientific and commercial world. The experience they gain from working with analytics is invaluable."

MATLAB is listed as a common technical skill among LinkedIn members with an engineering background and is listed as a required skill in thousands of technical job postings.

System-wide Qualtrics licenses were made available to faculty and staff at the university for the creation of surveys related to their work and/or academic studies. Qualtrics is a web-based tool with customizable templates that makes survey creation and distribution easier for faculty and staff.



**“MATLAB allows students exposure to a powerful tool they will likely encounter in the scientific and commercial world. The experience they gain from working with analytics is invaluable.”**

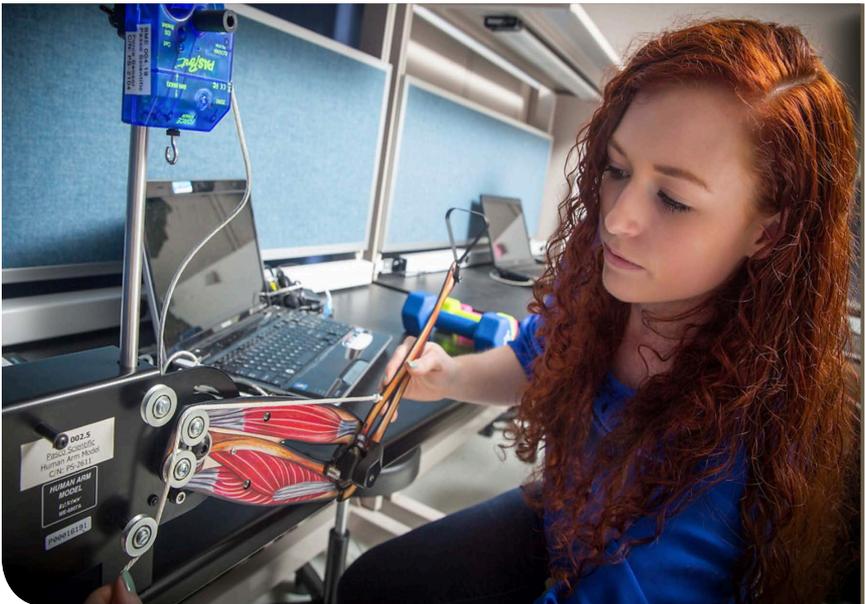
***Dr. Subrahmanyam Bulusu***  
*Professor of  
Satellite Oceanography  
and physical oceanography*

## Beyond the Classroom Matters

The Division of Information Technology partnered with the Division of Student Affairs to support student success through analytics. Beyond The Classroom Matters® is a supplemental student information system for student affairs, academic support, and other experiential programs. The university provides a wide range of innovative programs and services that support the unique circumstances of individual students and enrich the educational experience of all students. Each student's involvement in these programs is unique, according to the student's interests, needs, and goals. Beyond The Classroom Matters® adds an important component to the university's student information system, linking engagement in experiential programs to academic records, creating a more comprehensive educational record for each student.

## Blackboard Updates

An upgrade was made to Blackboard, enabling assignment reminders for students, assignments submission receipts, a new inline grading tool, the ability to drop and drag files and folders, and more. In addition, an investment was made in Blackboard Ally. Ally helps build more inclusive learning environments and improve the student experience by making digital course content more accessible. The program will be fully implemented in the near future.



# Modernizing Infrastructure and Business Processes

It is impossible to advance the academic and research missions of the university without reliable technological infrastructure. Many improvements were made to the infrastructure, and many more are planned for the future.

## Wireless Network Expansion

The number of devices that connect to the university wireless networks has drastically increased due to the popularity of tablets, smartphones, gaming, streaming devices, exercise trackers, and more. The average student and employee connects a minimum of three devices to the wired or wireless network on a given day.

The division is working on a significant, multi-year project to upgrade the campus wireless infrastructure. While nearly 2,800 wireless access points and 400 switches were replaced in 71 buildings, an additional 41 buildings still need updates and additional wireless access points to improve connectivity. The division will work to continually improve and address issues with wireless.

## Banner 9 Administrative Pages

In early 2017, Ellucian announced that Banner 8 would be retired effective December 2018 and replaced with Banner 9 Administrative Pages. The university is in the process of transitioning to the new version of the student administrative system and will be one of the first adopters of the system. As a result, university representatives were asked to make a presentation about the experience at the Ellucian Live Conference.

Banner 9 will bring a fresh user experience, new tools, and significantly improved capabilities. Users can also expect a more consistent look and feel, as well as an enhanced navigation experience.

## Identity and Access Management

Work began on improving Identity and Access Management (IAM). IAM ensures the digital safety and privacy needs of students, staff and faculty are being met and the security of sensitive information. Once implemented a successful IAM program would provide a single sign-on for all students and employees to eliminate the need to maintain multiple passwords. Not only will a single sign-on be easier for users, it will also reduce administrative overhead.

## PeopleSoft HR-Payroll Project

The PeopleSoft Human Resources-Payroll project is the final step in modernizing the administrative platform at the university. The multi-year initiative will replace the university's 30-year-old legacy



payroll system with a modern, integrated system to manage human resources and payroll functions. The new system, when implemented in early 2019, will significantly

improve compliance, reduce risk, provide better data for decision making, and increase standardization and best practices across the institution.

A critical step to modernizing human resources and payroll is the decommissioning of the university mainframe. It is no longer cost-effective to operate the antiquated mainframe. The hardware and storage media are years beyond their supportable lifecycle. Decommissioning the mainframe will be the final step toward modernizing these critical business processes and reduce risk.

## Data Management

Data is an institutional resource that powers innovation and guides the university toward new levels of insight. Work began this year to manage and protect university data. We added a Data Standards Program Manager to the current team and purchased a platform to manage data definitions. This platform, or “data cookbook” will serve as the central repository of data definitions and serve as a data governance tool. Having one location to store terminology and specifications will improve the visibility of existing reports and provide clear, agreed-upon terms for the creation of new ones.

## Technical Review Board

A Technical Review Board was appointed to determine what IT resources are available in our toolkit, what we are missing, and develop plans for future needs. The group will ensure future technology choices are the best option for all groups and departments, reduce redundancy across the system, and help reduce IT costs.



## Increased Involvement

Input from a broad base of stakeholders is necessary to ensure IT services support the academic and research goals of the university. Over the past year, several governance groups were formed to provide a more transparent and inclusive environment and to gather valuable input on IT investments and strategic visions. Engagement with these groups not only strengthens relationships, but also helps instill a shared vision for IT at the university. These engagements also help develop a greater understanding of the challenges we face as an IT organization. A Student IT Advisory Committee, Faculty and Staff IT Advisory Committee, the Student Systems Council, and the IT Security Advisory Committee were developed. More groups are planned for the future.

### Student Systems Council

The Student Systems Council is a voting, decision-making body made up of representatives that work directly with students. The Council is responsible for the review and approval of projects and enhancements related to student systems such as Banner and my.sc.edu. The group prioritizes projects across units and resolves conflicts between competing projects. They approve the Student Systems roadmap and recommend technology-related university policies.

### Faculty and Staff Advisory Committee

The Faculty and Staff IT Advisory Committee consists of approximately 30 cross-representative thought and opinion leaders that work together to make sure all stakeholders' interests and needs are considered.



More than **70 students, faculty, and staff** participated in IT governance groups in FY 2017-18, like the Student Advisory Committee shown to the left. The DoIT plans to develop additional groups in the future.

The group meets four times per year to discuss and prioritize IT topics for further exploration. Committee members identify IT initiatives that will benefit the education and research goals of the university. Topics on which to focus are selected by vote of the entire committee. Small, ad-hoc teams are assigned to each topic. These teams take approximately 6-8 weeks to research topics, identify benefits of implementation, uncover potential restraints, and submit a formal report to the entire committee. The committee then makes recommendations to the Vice President for Information Technology based on the findings of each group. Each recommendation is considered for implementation.

## **Student Advisory Committee**

The Student Advisory Committee is an officially chartered group of the Student Government Association. Comprised of 15-20 members representing a variety of disciplines and majors, the group meets with the Vice President for Information Technology four times per academic year. The committee allows central IT to share developments and updates, and gain valuable input. Students are also encouraged to share ideas and ask questions about IT initiatives. The students are then charged with sharing information they learn with their peer groups.

## **IT Security Advisory Committee**

The IT Security Advisory Committee includes approximately 20 members from academic and administrative areas, with a mix of both faculty and staff. The group provides advice to the Chief Information Security Officer regarding information security and how to best achieve the goals of the Information Security Program. It also promotes visibility of information security across the system.

# Service Improvement

The DoIT began a multi-year initiative to improve efficiency and transform our level of customer service. The ultimate goal is to create a culture of continual service improvement guided by the principles of Information Technology Service Management (ITSM).

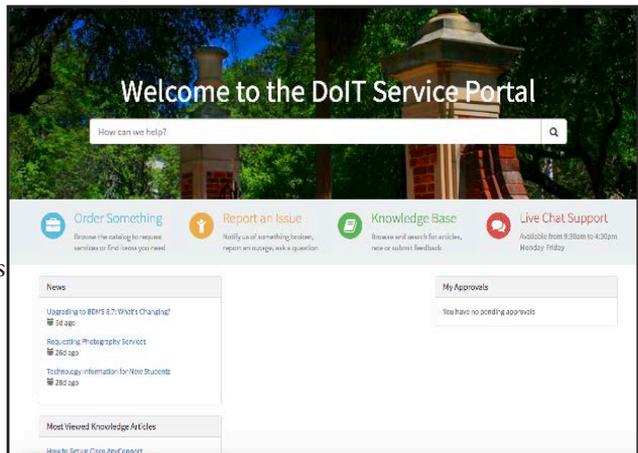
## Introduction of ServiceNow

ServiceNow is the centerpiece of DoIT's enhanced IT service approach. The launch required a significant time investment from many across the organization and engaged several campus partners. As a single, modern platform for all aspects of service, from incidents and inquiries to service requests, ServiceNow will enable DoIT to create smart, collaborative workflows. Over time, added benefits will include: improved service delivery, cost reduction, greater efficiency, and higher customer satisfaction.

## Self-Service Catalog Expansion

The self-service catalog, [sc.edu/ithelp](http://sc.edu/ithelp), was introduced to allow individuals to easily request technology assistance or report an issue. In addition, the Knowledge Base was greatly enhanced, providing step-by-step instructions to address common IT requests such as password resets. The Knowledge Base puts a variety of information in the hands of the customer, allowing them to complete an IT task independently, without calling a service technician.

Over the past year, we made tremendous progress in changing how DoIT delivers services. However, this is only the beginning of our transformation. More work will be done to improve IT processes and service delivery to our customers.



# Planning for the Future: 2018-21

Developing strategic, long-range goals related to IT is critical for the success of the university. The following strategic priorities have been developed.

## Strategic Priority 1

### Advance the academic and research missions of the university

*The preeminent priority of the DoIT will be to make substantive contributions to the teaching and research missions of the university.*

**Example:** Establish an IT Research Advisory Council to prioritize investments in IT research

## Strategic Priority 2

### Enhance the student digital experience

*The DoIT will equip students with the technology necessary to achieve academic success.*

**Example:** Develop a technology portal that combines various resources into one centralized, searchable location

## Strategic Priority 3

### Improve administrative efficiencies

*We will work to streamline administrative systems and processes to minimize overhead and duplicated work.*

**Example:** Eliminate obsolete systems and redundancies

## Strategic Priority 4

### Establish a best-in-class service delivery model

*The services offered by the DoIT should be easily accessible, competitively priced, and repeatable.*

**Example:** Work with comprehensive universities & Palmetto College campuses to create a collective Service Catalog

## Strategic Priority 5

### Provide a reliable and flexible technology infrastructure

*The DoIT will plan for future growth and innovation by providing a technology infrastructure that can be expanded, upgraded, and replaced to meet growing needs.*

**Example:** Work with key stakeholders to establish best-in-class data management practices

***The entire list of objectives can be found at [sc.edu/it](http://sc.edu/it).***



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Division of Information Technology

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