

Information and Communication Technologies (ICT)



Program Evaluation
2018-2019

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About the Program

In every aspect of its mission, ICT places an emphasis on supporting student access to technology, student engagement, student achievement, and superior customer service.

In this evaluation ICT has provided data sets and information regarding the various functions performed by the department. The purpose is to allow the reader to get a general idea of the scope and breadth of the role of the department in the overall function of the Shawnee Mission School District.

In places where appropriate, the data are coupled with brief narratives or graphical representation to clarify what is being shown. Some data sets, however, are simple aggregations of what has been done, is being done, or will be done in relation to a given function, project, or other work/performance item.

The evaluators have endeavored to limit the use of industry language and abbreviations. In those places where it was necessary, footnotes have been provided in an attempt to offer clarification. That being said, quite a bit of what ICT does is “technical” so the data sets presented do contain some technical information.

Additionally, it’s important to note that much of the data represented in this evaluation is taken from only the previous two fiscal years. Longitudinal data should be the goal of any data driven organization. That being said, ICT’s data is less longitudinal at this time for a few basic reasons:

1. With the implementation of the 1:1 initiative and a cycle of refreshes, the district made a massive transformation from a “fixed station” model to a “highly mobile” model for end-point devices. As such, it took some time to reconfigure data collection processes and reporting to better reflect the new overall paradigm for technology in the district.
2. Many platforms that were used previously, such as the tech support ticketing system, were changed to accommodate the changing technology environment. As such, those systems have only matured over the past couple of fiscal years.
3. Some data is just plain new. Items such as device repairs and tickets for mobile, 1:1 devices simply didn’t exist prior to the paradigm shift that came with the Digital Learning Initiative. As such, models, practices, and procedures had to be formulated to accept input data from the new paradigm. Some of those initial attempts proved to be inadequate and/or unsuccessful and had to again be addressed, changed, and tested.

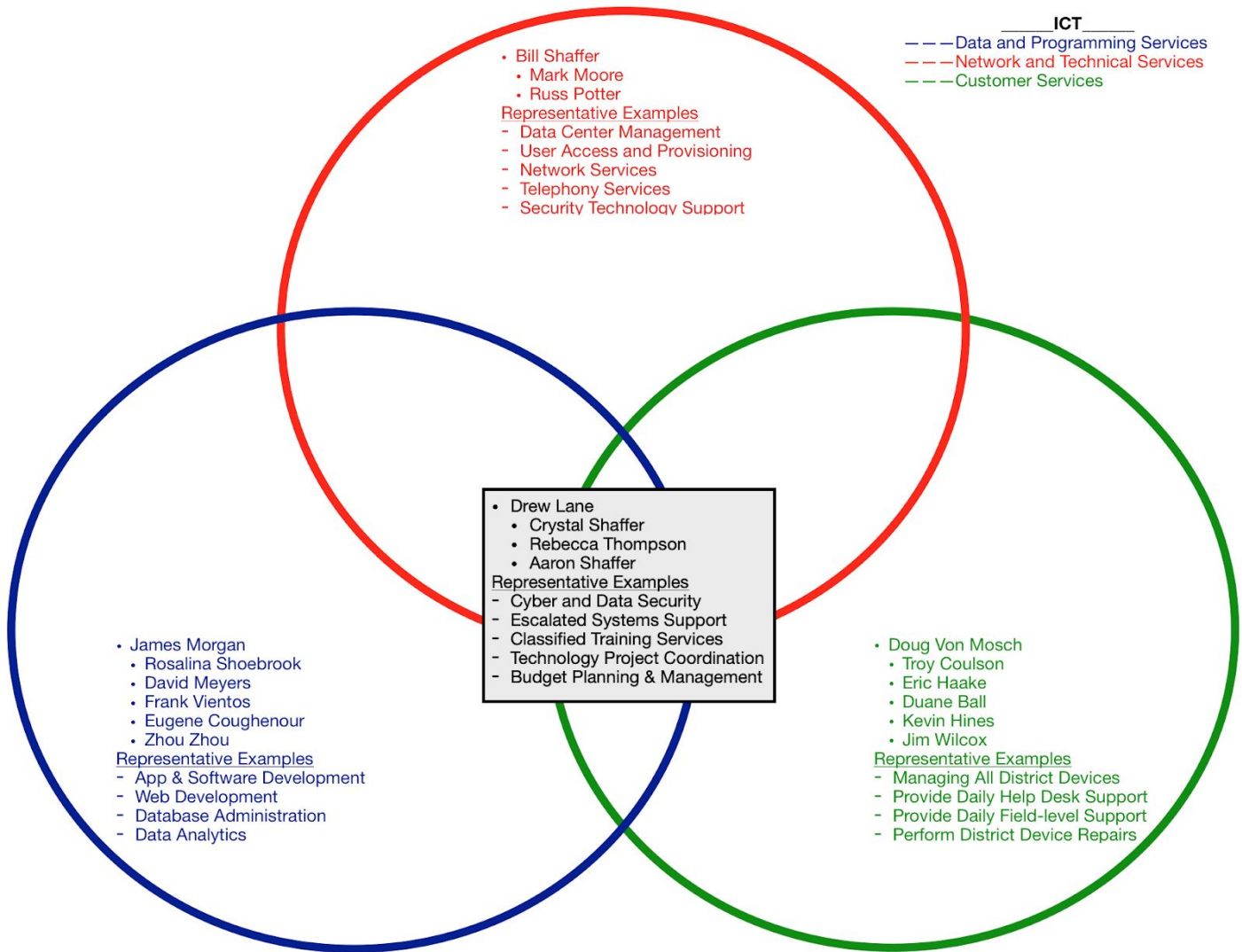
Moving forward, longitudinal data will be available. As the ICT team adjusted to the new paradigm, there was also an emphasis placed on using systems that were more open and could more readily export data should a system change be adopted. As an example, our current tech support system is much more capable of exporting data in a usable format that could be imported into a new system. The previous system the district used was not accommodating in this way.

The ICT department consists of a team of 53 dedicated professionals. The department is further refined into 3 overlapping areas of concentration designed with agility and collaboration in mind. As represented in the

accompanying graphic, these areas of concentration provide structure and logic for the functions and tasks performed by the department as a whole. Representative examples of responsibility and functions are provided in the graphic but it should be noted that each area of concentration relies on the other to be complete.



Information and Communications Technology Department Organizational Structure



ICT supports the district's mission through the following:

1. Providing a safe, reliable, and efficient technology environment in which all users have the tools necessary to facilitate learning, engage in learning, and administer the day-to-day business of the district.
2. Safeguarding the technology environment with the pragmatically least restrictive protocols, practices, and policies that best meet the needs of the district and all the district's technology users.

Support of the district's mission is done through the deployment of exemplary technology. Deployment of exemplary technology is the result of vision, purpose, and planning. As such:

- ICT provides vision that keeps the district at the forefront of educational technology.
- ICT derives its purpose from the goals set forth by the district as they pertain to the educational needs of students.
- ICT engages in strategic and tactical planning that supports its vision and purpose.
- ICT is dedicated to its fundamental role as a support department to the SMSD organization.

Through the deployment of exemplary technology, ICT provides services that are accessible and relevant. ICT strives to support a highly mobile, functional environment for all aspects of district technology needs. This is accomplished through the following core functions:

- Performing all functions associated with data center and resilient site management.
- Engaging in all aspects of user access and provisioning.
- Providing all associated activities related to network (data transport) services.
- Delivering all telephony¹ services across the district.
- Performing security technology support as it's related to the district's video camera and door access systems.
- Supporting all aspects of managing district endpoint devices.
- Providing daily Help Desk and field-level customer support.
- Performing repairs on district devices.
- Engaging in App, Software, and Web development.
- Performing all aspects of database administration on multiple, enterprise level databases.
- Applying data analytics to a wide array of district data sets.
- Engaging in industry standard, enterprise level cyber and data security practices.
- Providing escalated systems and technical support for intra-department purposes.
- Developing, providing, assessing, and organizing classified training services.

¹ The working or use of telephones.

- Providing technology project coordination and management.
- Performing technology budget planning and management.
- Developing and maintain strategic vendor partnerships.
- Managing the district's participation in the E-Rate program.
- Performing “proof of concept” evaluations on emerging technology.
- Working inter-departmentally to meet all customer technology needs.
- Reviewing hardware and software requests inter-departmentally to ensure interoperability and academic appropriateness.

Area of Focus

ICT's execution on the above mentioned core functions is further detailed in the following section. By providing data sets showing additional detail, ICT's focus is broken down into 4 general concentrations and reveals what and how each concentration performs work related to ICT's core functions. Digital technology and its use is a rapidly changing landscape. To remain relevant to the future needs of our students, ICT engages in a number of strategic, tactical, and daily objectives to support the district's mission of educating our students. Therefore, the department maintains focus on those core functions while at the same time being mindful of that rapidly changing landscape to keep the district positioned to take advantage of new and exciting opportunities.

Concentration 1: ICT General

The department overall focuses mainly on coordination of the other three areas of concentration. Additionally, at the department level, the team engages in:

- Assessing, analyzing, and mitigating Cyber and data threats.
- Provides methods of support escalation to other members of the department. As an example, a field technician may run into a problem that's bigger than a single device or may represent a larger overall problem that requires additional resources from systems analysts, engineers, programmers, etc.
- Developing, delivering, and assessing training for classified personnel in the district.
- Coordinating and managing various projects involving technology deployments across the district and during the entire calendar year.
- Strategic budget planning and tactical management for a large number of inter-department technology purchases, subscriptions, and recurring cost items.

Project Management and Coordination

Between May 2017 and August 2018, ICT engaged in the completion of approximately 100 named projects. These projects ranged from the fairly regular tasks of end-of-year data clean up and hardware assessment to the very large refresh of 1:1 devices. Each project had a named lead with overall coordination being performed by the departments executive secretary, Crystal Shaffer. The grid below provides a representative sample of the scope of projects performed during the stated time period.

Summer Device Repairs	WiFi Infrastructure	Elementary Bldg Moves	Network Resilience
Employee Jump Starts	Food Service Upgrades	Student Device Imaging	Faculty 1:1 Refresh
Student 1:1 Refresh	Phone System Relocation	Bistro's Aloha System	Aspire VDI Deployment
Marathon Health Clinic	VSOM/CPAM Maps	Email Migration O365	BusinessPlus

The breadth and scope of training provided to classified employees can be discerned from the above chart. This sample set of data was collated for fiscal years 2017 and 2018. Providing timely and relevant training on systems classified personnel use to perform daily tasks is essential. The ICT team utilizes a single, full-time person, Rebecca Thompson, for this functional component of the department.

Sample of Training Deliverables

<u>Description</u>	<u>Target Audience</u>	<u>Quantity Delivered</u>
Google applications, file storage	CAA classified staff	25-30 direct training sessions, plus 35-40 ad hoc sessions
Cisco WebEx Meetings Cisco WebEx Team	Classified Office Staff in Schools and CAA; some certified	40-50 initial trainings, plus 25-30 additional sessions
Skyward	Onboarding for Classified Office Staff in Schools and CAA	70-75 direct training sessions
	Continuing training for Classified Office Staff in Schools and CAA; some certified	50 direct training sessions 350-400 ad hoc sessions
Documentation/videos created or updated	SMSD staff and families	35-40

By maintaining quality equipment, refreshing it regularly, and reselling used equipment, the district is able to maintain sustainability in the various device programs including the current 1:1 initiative. This is accomplished through strategic capital outlay planning exemplified in the table below.

Sample of Strategic Capital Outlay Planning

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
iPads	Year 3	Buy/Sell/Year 1	Year 2	Year 3	Buy/Sell/Year 1
CTE Labs	Year 3	Year 4	Year 5	Buy/Sell/Year 1	Year 2
Yearbook Journalism Labs	Year 3	Year 4	Year 5	Buy/Sell/Year 1	Year 2
Teacher and HS MBAs	Year 2	Year 3	Year 4	Buy/Sell/Year 1	Year 2
MS MBAs	Buy/Sell/Year 1	Year 2	Year 3	Year 4	Buy/Sell/Year 1
Business/Admin Services	<i>Pre Plan Period</i>	Year 5	Buy/Sell/Year 1	Year 2	Year 3
PLTW/Gaming & Animation	<i>Pre Plan Period</i>	Buy/Sell/Year 1	Year 2	Year 3	Year 4

Concentration 2: Technical, Network, and Security Services

The Technical, Network, and Security Services concentration within ICT provides cost-effective, dependable, and high-quality planning, development, implementation, and support of functional areas such as:

- Escalated support and management assistance for all district devices.
- VSOM² (Video Surveillance Operations Manager).
- CPAM³ (Cisco Physical Access Manager).
- Active Directory.
- Collaboration platforms such as Google's GSuite, Cisco's Webex, and Microsoft's Office 365.
- Wired and Wireless networking.
- Content filtering.
- VoIP⁴/Analog telephony.
- Data storage and data backup/restore.
- Cyber security⁵ and data security⁶.

² VSOM is the system used to administer the district's video surveillance system.

³ CPAM is the system used to administer the district's door access system.

⁴ VoIP is Voice over IP (Internet Protocol).

⁵ Protecting data that is found in *electronic* form. Part of that is identifying what the critical data is, where it resides, and the technology you have to implement in order to protect it.

⁶ Concerned with making sure data in *any form* is kept secure and is a bit more broad than cybersecurity.

Technical Services (TS)

Technical services performs the vast majority of the systems analysis and systems engineering required by the district to operate nearly every other service. Personnel in this area are responsible for all data center functions and provide escalated support services to other ICT personnel.

Technical Service by the numbers:

# of Active Directory Objects	41418
# of Active Directory Groups	1478
# of Active Directory Students	27838
# of Active Directory Staff	4714
# of Physical Servers	45
# of Virtual Servers	171
# of VSOM/CPAM Servers	72
# of Windows Desktops	1340
# of Windows Notebooks	519
# of Managed Copiers/Printers	279
# of Thin Clients	50
# of Time Clocks	89
# of Cloud Based Application	17
# of Single Sign On Applications	6
# of Email Accounts	32552



- Recent Projects
 - O365 Migration (completed)
 - Moved to cloud to reduce the cost of purchasing new hardware, also to upgrade our current version of Exchange at no cost to the district.
 - P2V⁷ Servers (still ongoing)
 - ICT was able to virtualize 153 physical servers to reduce the hardware cost and power cost. This meant ICT only had to purchase 45 physical server that were end of life.
 - Data Center Move (completed)
 - Since a new Data Center was being placed at the new CAA we were able to use Indian Creek as a primitive disaster recovery site.
 - Website (completed)
 - SMSD's outdated web presence was upgraded .
- Upcoming Projects
 - Filebound/docStar migration
 - docStar is end of life and is being migrated into Filebound.
 - WSA to OpenDNS conversion⁸
 - ICT is testing the possibility of using OpenDNS as its content filter.
 - Kronos
 - Software is being upgraded and end of life Kronos clocks are being replaced.
 - Consolidate Web Servers
 - ICT will be consolidating web servers to allow for better support, Operating system upgrades and ease of management.
- Ongoing Day to Day
 - Application Updates/Patches.
 - VDI⁹.
 - Backup/Restore functions.
 - Server system engineering, analysis, and administration.
 - Active Directory administration.
 - Escalated support tickets.
 - Employee and student email administration.

⁷ Physical to Virtual conversion. Computers that previously operated on physical hardware are converted to virtual computers that share resources with other virtual computers on more robust host hardware.

⁸ These are both methods of performing content filtering. OpenDNS represents a more efficient and reliable method.

⁹ Virtual Desktop Infrastructure is virtualization technology that hosts a desktop operating system on a centralized server in a data center. VDI is a variation on the client-server computing model, sometimes referred to as server-based computing. The term was coined by VMware.

Network Infrastructure Services (NIS)

Network infrastructure services manages all aspects of data transport. Personnel in this area are responsible for all data transport functions, including voice communication, and also provide escalated support services to other ICT personnel.

NIS by the numbers:

# of Managed Switches	326
# of Managed Routers	7
# of Access Control Gateways	568
# of Access Control Card Readers	601
# of WIFI Access Points	2649
# of Data Closets	221
# of Data Centers	2
# of VOIP Phones	3302
# of Analog Phones	253
# of Active Voice Mailboxes	2840

- Recent Projects
 - Data Center Move (completed)
 - Since a new Data Center was being built at the CAA we were able to use Indian Creek as a primitive disaster recovery site.
 - Network Redundancy (still in progress)
 - Ability for network interruptions to affect less buildings.
 - End of Life switch replacement (completed)
 - Replaced End of Life switches with new models .

- IDF/MDF¹⁰ cleanup (still in progress)
 - NIS was able to do a switch consolidation, we will back to the closets and straighten up all the cabling and also remove unused equipment.
- Wireless Network Functional Change (completed)
 - All wireless traffic now goes out of CAA .
- 802.1x wireless (completed)
 - Allows for tighter security with wireless devices.
- Upcoming Projects
 - WSA to OpenDns conversion
 - ICT is testing the possibility of using OpenDNS as its content filter, OpenDNS is included with our Cisco Security ELA.
 - Brookwood network install/configure
 - With construction complete and underlying necessary systems we are installing the network.
 - Aquatic Center network install/configure
 - Once building has been built we will be installing the network.
 - Replacement of communication system hardware
 - NIS will be replacing end of life servers that handle the phone systems.
 - Replacement of server/host hardware for network access/security system (ISE)
 - NIS will be replacing end of life servers that handle the districts authentication/policy servers.
 - Software Defined Access/Network (SDA/SDN)
 - A newer technology that makes networks programmable and less expensive to build and operate.
 - 802.1x¹¹ Wired
 - Will allow ICT to better control access to wired ports.
 - Cisco DNA Center
 - Will allow for better management and security of the network.
 - RFP for Internet Bandwidth
 - Our current contract will expire on July 1st 2019.

¹⁰ An intermediate distribution frame (IDF) is a free-standing or wall-mounted rack for managing and interconnecting the telecommunications cable between end user devices and a main distribution frame (MDF).

¹¹ The IEEE 802.11X standard defines how to provide authentication for devices trying to connect with other devices on LANs or wireless LANs.

- Ongoing Day to Day
 - Security Updates for Servers.
 - Application Updates/Patches.
 - Security updates for hardware.
 - Network performance monitoring.
 - WIFI management.
 - Network Access.
 - Support tickets.

Security Cameras

Personnel in this area are responsible for all backend, technical support for the district's ubiquitous video surveillance equipment. Additionally, they work closely with personnel in Safety and Security to quickly address issues that come up with these systems.

Security Cameras by the numbers:

# of Cameras	1750
# of Video Servers	67
# of Video Monitor Workstations	65
# of Incident requiring video to be archived	<50 per month

- Recent Projects
 - Configure security cameras for new buildings
 - Lenexa Hills (completed).
 - Brookwood (almost finished).
- Upcoming Projects
 - Arrowhead
 - Converting building to new video system.
 - Aquatic Center
 - Once built security cameras and door controls will be installed.
- Ongoing Day to Day
 - Misc camera replacement/troubleshooting.
 - Server optimization.

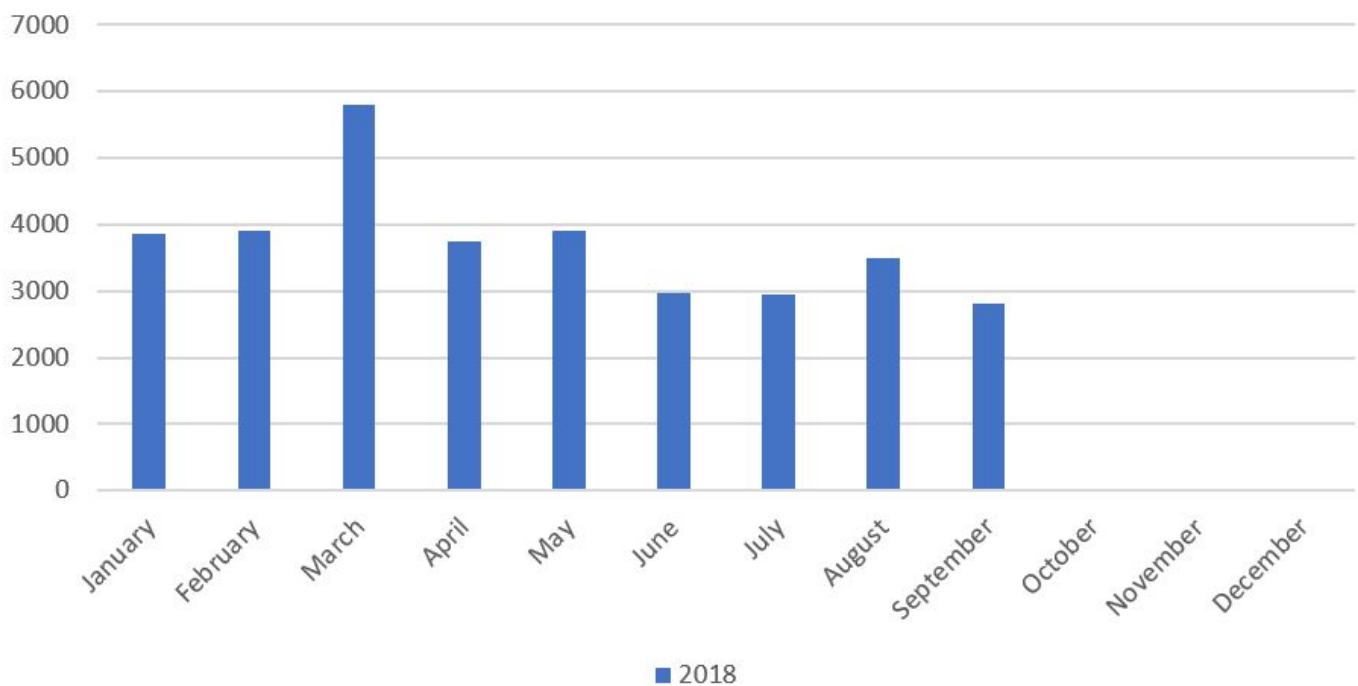


- Support Tickets.

Security Services

Security services personnel are responsible for all aspects of Cyber and data security. The professionals in this area maintain industry certifications in Cyber and data security and routinely audit, monitor, manage, and configure systems that are integral parts of the district's security stance.

Number of Firewall Alerts per month for 2018



Because of the sensitive nature of the work performed in this area, ICT has not included specificity about what systems are used to maintain the district's security stance. However, the list below outlines some of the functions and work performed by this group in a general manner:

- Review disclosed vulnerabilities and make recommendations.
- Monitoring day to day data security.
- Monitor use of data files and regulate access to safeguard information in computer files.
- Review violations of computer security procedures and discuss procedures with violators to ensure violations are not repeated.

- Perform risk assessments and execute tests of data processing system to ensure functioning of data processing activities and security measures.
- Confer with users to discuss issues such as computer data access needs, security violations, and programming changes.
- Performing both internal and external security audits.
- Investigations:
 - Internet history.
 - Cyber Bullying.
 - Suicide.
 - School Threats.
 - App Usage.
 - Email.
 - Litigation Hold.
 - Investigation lost/stolen devices.
- Recent Projects
 - Security review of Trophy Kiosk at South (completed)
 - New compute device needing access to SMSD's network.
 - Implementation of Advanced Web Reporting (completed)
 - More advanced internet activity reporting.
 - Implementation of OpenDNS with WSA content filtering (completed)
 - District is currently using the WSA and OpenDNS for content filtering.
 - Security Tools Implemented
 - Tools that allow industry leading alerting, auditing and testing for vulnerabilities.
 - Server Cipher review (completed)
 - Review to see if any insecure Ciphers are being used.
 - Data Center move (completed)
 - Reviewed network configuration for security concerns.
- Upcoming Projects
 - Continue testing to see if SMSD can configure OpenDNS for all external content filtering
 - In place of the WSA's.
 - Several Security related enhancements
- Ongoing Day to Day
 - Security vulnerability assessment
 - External & Internal.
 - Investigation requests
 - Security log reviews, user access reviews, regulatory compliance, and support tickets

Concentration 3: Data and Programming Services

This area of concentration within ICT provides high-quality and dependable planning, development, implementation, and support of databases, apps, software, and web applications which includes functions such as:

- Setup.
- Security access and security levels.
- Customization.
- Programming.
- Database maintenance.
- Data transfer.
- Data analytics.

Additionally, DPS continually works to enhance applications and improve data transfer to support students, parents, and staff, performs numerous data validity audits, performs audits to find and to continue to reduce the potential number of points of failure with data transfers and data input, and works to automate processes when possible to reduce potential data entry errors and to provide information in a more timely manner.

Critical Core District Support

- BusinessPlus processes
 - Finance - purchase orders, cash receipts, invoices and payments, journals, ledgers, auditing requests, store inventory orders, vendors, and 1099 reporting.
 - Payroll - process pay runs, health insurance remittance, KPERS payments, auditing, W-2, 1095-C reporting, pay increase/adjustments, state reporting, leave accruals, and tax updates.
 - Human Resources - new hires/rehires, terminations, licenses, certificates, teachers evaluations, and contracts.
 - Benefits - benefits enrollments (Health, Vision, Dental, Accidental, Critical Illness, Life , Short Term Disability, ID theft Protection, Long Term Care etc), update dependents enrollments, validate benefits data integrity, and enroll qualified employees to wellness incentive rates.
 - Fixed Assets - add new assets, update and retire assets, and depreciation.
 - Employee Online - current year and historical paycheck lookup, leave tracking, dependents/beneficiary updates, and emergency contacts.

- Year End Processing - roll over job assignments, leave accruals, summer payrolls, close/open fiscal year transactions, roll over POs, and data integrity checks.
 - Create CDD reports/Cognos reports for Finance/HR/PY¹²/Benefits.
 - Workflows - approval of purchase orders, store inventory orders, notify new hires, terminations, create employee online accounts, scheduled jobs.
-
- Create/Support interfaces between third party systems and BusinessPlus
 - Kelly Educational Staff (Substitute Management system)
 - Extract employee demographic/job data from BusinessPlus and upload to Kelly/FrontLine.
 - Import employee absence data from Kelly/FrontLine into SMSD absence database.
 - Create, validate, and maintain the program for Payroll to load the data into BusinessPlus pay runs to process the absences and keep track of leave balances in a customized web application.
 - Benefits Direct (BD)
 - Extract employee benefits enrolled census file and employee dependents demographic file to send to BD.
 - Import Benefits enrollment file and new dependents as well as benefits covered dependents into BusinessPlus after Open Enrollment closes.
 - Kronos
 - Modify Kronos RPG program to allow supervisor changes during the summer.
 - Add new job codes to Kronos to allow new employees to use the time clocks.
 - Grant access to supervisors to allow time card approval of their staff.
 - PrimeroEdge¹³
 - Customized automated imports and exports as well as interfaces between the systems.
 - Generate audit reports as well as discrepancy reports for labor hours between BusinessPlus and PrimeroEdge.
 - Generate discrepancy reports for payments between Skyward and PrimeroEdge.
 - Marathon Clinic
 - Extract employee/dependent benefits data from BusinessPlus and automate upload for Marathon Clinic.

¹² Human Resources/PaYroll

¹³ This is the Food Service software platform for the district.

- Create, validate, and export data for benefits vendors (VSP, Delta Dental, Blue Cross Blue Shield) which includes EDI 834 enrollment file for BCBS and district enrollment files for Delta KS and VSP.
- Create/Support customized software and web applications between third party systems, databases, and BusinessPlus
 - SMSD: Kronos - This application manages custodian overtime hour requests and has the capability to split out and merge data into the payroll file that is generated from Kronos. It has an automated task that sends a daily employee import file to Kronos that contains all the employees that clock-in use or administer this payroll system. There is also the capability to send these files to Kronos on demand. When payroll is run every two weeks, this application will take the output from Kronos and merge the overtime hours in addition to any change in account code or permit numbers.
 - SMSD: BusinessPlus - This application processes certain tasks that are not capable in the primary BusinessPlus system. The following tasks were added:
 - Historical Paychecks Lookup.
 - Leave balances that include both current and future leave.
 - Prepares teacher contract data.
 - Special-Ed funding report.
 - Note: All applications have been converted to use the BusinessPlus database. The look and feel of each application was changed to appear similar to the new website.
 - SMSD: General Timesheets - This application manages requests from employees to be paid for specific work tasks that are not a part of their primary job responsibility. It was recently modified to work with BusinessPlus and has the capability to generate a timecard file on demand that can then be imported into the payroll system. Over 200,000 requests have been processed during the life of this application.
 - SMSD: Consultant Application - This application is used to determine if a request for service is to be paid by consultant funds. Approximately 6,000 requests have been processed during the life of application. We are investigating an enhancement to the app which would generate a file that can be imported into BusinessPlus for purchase order creation.

Student Information System Support

- Student Information System (Skyward)
 - Create, maintain, and validate custom forms
 - Testing forms.
 - Online Verification configuration and setup.
 - Family Access.
 - Student Access.
 - Data Mining to retrieve Online Verification data.
 - Special Education forms.
 - Skycoder.
 - General support of all custom forms.
 - Coordinate Upgrades / Releases / Addendums
 - Identify software issues/requests and report to Skyward for updates.
 - Review software fixes and upgrades on Development before installing onto Production.
 - Identify product upgrades that will directly affect SMSD users.
 - Setup and configure new schools
 - Research, configure, and maintain new processes and setup areas that the district users need such as:
 - Lockers by team.
 - Specific building bells.
 - New state and national report data extractions.
 - Foster data.
 - Career Plans.
 - RTI.
 - Tardy Kiosk.
 - Mobile student ID card.
 - Guidance.
 - new version of Skyward.
 - New Skyward Module research, setup, and maintenance
 - Monitor and manage data integrity for all entities
 - Duplicate Staff and Students.
 - Enrollment/Withdrawals.
 - Staff security.
 - Skyward Calendars.

- Grading Periods.
 - Report cards.
- Secondary and Elementary Future Scheduling support
- Apple School Manager (ASM) Skybuild maintenance, questions & support
- Data Integration - Create, validate, and maintain imports and exports with various third party systems to provide information needed for students, parents, administration, and staff. These include but are not limited to:
 - Transfinder Import/Export.
 - PrimeroEdge Import.
 - ASM Export.
 - Discovery Ed Export.
 - Edgenuity Export.
 - iStation Export.
 - Performance Matters Export.
 - Raptor Export.
 - TCI (Clever API).
 - Big Ideas (Clever API).
- Summer support and tasks
 - Skyward Student Records Year End.
 - Summer School setup and support.
- KSDE KIDS data exports
 - Claim (ASGT) records done first of school and then weekly.
 - Withdrawal (EXIT) records done weekly.
 - End of Year (EOYA) records done after school ends.
 - CTE Course & Migrant (KCAN) records.
- Correct and maintain student accounts in fee management module
- Provide support for interface between Skyward and eFunds
- Create student and course fees for next school year to support rollover
- Run rollover for fee management module
- General Skyward support for questions and issues from all types of users
 - Web tickets, emails, phone calls, WebEx Teams, meetings.
- Other Items currently in development
 - Crystal Reporting for health and other areas.
 - Arena Scheduling for secondary schools.
 - Tardy Kiosks at secondary schools.
- Destiny

- Create and maintain imports and exports of the transfer of all resource and library fines from Destiny to Skyward, all payments from Skyward back into Destiny, as well as manage fee setup in Skyward for both systems to match.
 - Audit and maintain double payments and refunds between Skyward and Destiny.
 - Maintain user permissions in all areas of Destiny from BusinessPlus work codes.
- Create/Support customized software and web applications between third party systems, databases, Destiny, and Skyward
 - SMSD App Security - This application currently manages permissions in Skyward and Destiny. This year we added the ability for the Special Ed department to manage user permissions for employees that are working in Special Ed. Approximately 70,000 records are created nightly to maintain the employee permissions in both Skyward and Destiny. We are continuously moving forward with our goal to streamline how employees are granted access to applications and to make it as seamless and automated as possible. For FY19, we plan to expand the capability of this application to manage access to all SMSD custom web applications. In addition to this, we may grant additional departments access to administer their own employee permissions.
 - SMSD ELL Reports - This application manages ELL student data in conjunction with Skyward. This application then provides specific reports to district admin and staff. Approximately 2,400 ELL students' contact minutes are managed in the application. Additional information regarding this application and the responsibilities for the programming team are as follows:
 - Convert ELL Minutes program from PeopleSoft to BusinessPlus.
 - Extract and validate ELL information from Skyward.
 - Maintain information for students who are receiving ELL services.
 - Transfer endorsed teacher information from BPlus to the ELL Minutes program.

This application is also used to create accurate state reports by including the student contact minutes with teachers in order to have a more detailed auditing report for ELL contact minutes than we have in Skyward.
 - SMSD CTE pathway reporting - This application enables a process to assign pathways to students based on their enrollment in Skyward. The CTE students are exported from Skyward

into the CTE program. When the assignments are completed and audited, the application then exports a finalized file to upload the CTE students and their assigned pathways to the state.

Other Customized Support

- Summer School - Convert, validate, and maintain teacher import from PeopleSoft to BusinessPlus. Support summer enrichment during the enrollment process.
- SMSD Instructional Rounds (IR) Application - Program, maintain, and update the IR app to include new objectives, allow the application to be run off the network when the instruction rounds are completed, and give more options for reporting for each user. We created a SQLite database to save data remotely to the JSON server in order to make the data available for web applications for reporting. We continually verify and maintain the transfer of the results of IR reviews to and from the reports server.
- Student code development - Provide help, support, and direction to students writing xCode apps for the iPads. Through the course of last year and the beginning of this year, we have helped students through the basics of xCode and have helped them enhance their apps by the addition of more advanced kits such as adding the SpriteKit, using physics logic and coding, and detecting interaction between objects.
- Student Fundraisers and Food Service Catering - Program, validate, and maintain applications and data flow that support student fundraisers around the district both online and point of sale. Create, validate, and maintain the web program that allows in-district departments to order Food Service catering services.
- eSchedule - This application manages all room reservations in the district. Over 90,000 reservations have been submitted over life of application.
- eVoice - This application allows teachers and administrators the ability to send an online questionnaire for students to complete.
- Leave and Travel - This application manages employee requests for leave and reimbursement expenses. Recent enhancements were made to the application to grant permissions online without the need to modify the application code. Over 12,000 requests have been processed during the life of this application.

- Utility Tracker - Periodically throughout the year, the utility information is uploaded into the application in CSV file format. The application then provides reports and analysis of how the utilities are spent throughout the district.

Data Integration and other Projects

The district utilizes a very large number of databases to manage raw data. This raw data is then continuously being processed into human viewable reports through work described previously. What follows here is a general representation of the data systems and databases that DPS coordinates with quantitative information about the work overall. This information is provided in an effort to quantify the work performed by DPS to make district data accessible to stakeholders for completion of their work.

- SQL/.NET/JSON¹⁴
 - Apple School Manager (ASM) staff export.
 - Azure ID and the purging of previous fiscal year ID card data.
 - BCBS EDI export.
 - BusinessPlus to PrimeroEdge export.
 - BusinessPlus workflow queue notifications.
 - Cisco Phone system export.
 - Monitor Skyward email queue status.
 - Auto creation of WebHelpDesk tickets.
 - Discovery Education export.
 - FinalSite export.
 - Free Approvals Notification export.
 - Frontline Professional Growth export.
 - Instructional Rounds Version modifications.
 - iStation staff export.
 - Kelly Absence and Substitute imports/exports.
 - Low and Negative Balance Notification export.
 - Marathon Health export.
 - Mileage Voucher export.

¹⁴ SQL stands for Structured Query Language and is a standard language for storing, managing, and retrieving data in databases. .NET is a software framework and developer platform for building web apps and services. JSON stands for JavaScript Object Notation and is a format for structuring data used primarily to transmit data between a server and web application.

- PrimeroEdge Import.
- PrimeroEdge user accounts import.
- PrimeroEdge to EfunDS export.
- PrimeroEdge to Skyward F/R status export.
- Reduced Approvals Notification export.
- Skyward active students to PrimeroEdge export.
- Skyward all students to PrimeroEdge export.
- Skyward to PrimeroEdge payment export.

- Database Administration *by the numbers*

Servers	9
Databases	316
Views	63,312
Stored Procedures	9,964

- Perform or maintain database and/or transaction log backups.
- Maintain user access (grant/revoke).
- Maintain database sizing and thresholds.
- Analyze, advise and correct errors found in error logs.
- Monitor database application performance and listeners.
- Maintain/Monitor concurrent jobs.
- Manage resource utilization (CPU, memory, disk and etc.).
- Manage database filegroups and partitions.
- Maintain database performance and tuning.
- Identify inefficient and/or long running queries/processes.
- Create, maintain, tune or modify indexes as needed.
- Manage tools/utilities that connect to the database servers.
- Install and configure database server software.
- Maintain and/or troubleshoot replication issues.
- Maintain instance management on database servers.
- Troubleshoot queries and related technologies.
- Assist with database application upgrades/patches.
- Provide advice on impact of upgrades/patches.

- Troubleshoot SQL blocking, deadlocks or other database related issues.
- Implement trace flags for troubleshooting deadlocks.
- Assist in debugging and tracing applications.
- Create and maintain SQL processes.
- Clone databases (with consideration of all dependencies).
- Create or maintain stored procedures.
- Create or maintain triggers.
- Create or maintain various database constraints.
- Install customizations to database applications.
- Create and maintain SSIS processes.
- Create and maintain agent jobs/processes.
- Apply database patches/fixes.
- Perform database upgrades.

Concentration 4: Customer Services

This area of concentration within ICT provides direct user support across a variety of hardware and software platforms in use at the district's 52 locations. Customer Services serves as a unified entry point for addressing the technology needs of district staff, students and patrons. The **Customer Services Workgroup** is formed through the efforts of 30 staff across four teams within ICT.

- The **Help Desk** team's primary role is to provide phone support, remote assistance and route requests within ICT to ensure the proper workgroup is engaged.
- The **Service Desk** team's primary role is the onsite repair of the district's Apple devices by maintaining a certified Apple Self-Servicing Account (SSA) status.
- The **Technical and Field Support** team's primary role is to provide face to face and day to day support of district adopted hardware, applications, and platforms.
- The **Teaching and Learning Services** team's primary role is to manage the district's Apple devices through a mobile device management (MDM) solution.

Help Desk

Primary Focus

- **Cisco Finesse** - Finesse allows ICT to provide phone support from a centralized Help Desk location. Callers have access to 5 staff members through a single common Help Desk phone number. Almost 9,700 phone calls were answered during the 2017-2018 school year. Help Desk staff also provide remote assistance through desktop sharing solutions. Each call made to the Help Desk is entered into the WebHelpDesk (WHD) ticketing system so that it can be routed to the proper workgroup within ICT. The Help Desk is responsible for:
 - Daily administration and management.
 - Creating, testing and implementing automated workflows.
 - Answering phone calls and returning voice messages.
 - Entering requests received into WebHelpDesk.
 - Prioritizing requests.
 - Resolving or routing of requests entered.
 - Timely and accurate documentation throughout the request's progression from 1st response to request resolution.
 - Escalating requests to other workgroups within ICT .
 - Providing walk-in hardware and software support.
 - Deskside software and hardware support at CAA.
 - Maintaining asset information in Destiny.
 - Identifying trends

Sampling of Other Duties Performed

- Process and route tickets for new users, transfers, and terminations.
- Create and remove user access in Business Plus and AS-400 systems.
- Prepare and issue equipment for new users.
- Coordinate retrieval of equipment for terminating users.
- Coordinate and organize tech jump start sessions to issue equipment for new staff and student teachers.
- Track and coordinate the return of equipment issued to student teachers.
- Provide onsite support for meeting and special events at CAA.
- Assist in hardware and software installations at CAA.
- Import, update, transfer, receive, and retire equipment into Destiny.
- Receive, route, and update inventory on defective and damaged staff/student device sent from buildings.
- Evaluate nonfunctioning iPads for damage and assigning fees as necessary.
- Complete paperwork on and update inventory on laptop repairs, accessing fees and notifying building if necessary.

- Image laptops to prepare for reissue.
- Configure and issue replacement devices for damaged or non-functional devices.
- Enter and manage Apple repair cases for defective or damaged iPads.
- Receive, process, prepare and update replacement iPads sent from Apple.
- Run and route Destiny asset reports.
- Fulfill additional inventory requests for iPads and MacBooks.
- Manage and coordinate pickup of surplus equipment.
- Coordinate pick-up and delivery of inoperable equipment from buildings to CAA for repair.
- Coordinate delivery of repaired and replacement devices to buildings.
- Replace projector lamps.
- Manage and organize supply room supplies.

Service Desk

Primary Focus

- **Apple Global Service Exchange (GSX)** - GSX allows ICT to troubleshoot, diagnose and repair Apple devices owned by the district. GSX provides tools and services that are not commercially available. With access to GSX, the ICT Service Desk is able to perform advanced diagnostics and component level repair that otherwise would require damaged and non-functioning devices to be mailed to an Apple Authorized Service Provider. Doing so would result in a substantial cost increase to the district and significantly impact repair turnaround time. More than 2,000 repairs were completed during the 2017-2018 school year. The Service Desk is responsible for:
 - Daily administration and management.
 - Maintaining compliance and program eligibility with Apple.
 - Troubleshooting, diagnosing and repairing of all Apple devices.
 - Determining warranty eligibility of each repair.
 - Determining the repair tier of each repair based on Apple's criteria.
 - Ordering replacement parts from Apple.
 - Returning parts to Apple for proper credit.
 - Cleaning repaired devices.
 - Documenting troubleshooting and repairs within WebHelpDesk.
 - Documenting Service Desk processes and procedures.

Sampling of Other Duties Performed

- Maintain an onsite Apple Diagnostic server.
- Order and maintain replacement parts inventory.

- Complete certification requirements as new hardware is released to maintain eligibility.
- Assist field technicians via Webex to reduce repair times.
- Provide 1 on 1 peer training to technicians that are newly certified and unfamiliar.
- Provide 1 on 1 peer training to technicians that rotate through the Service Desk monthly.
- Update and image repaired devices and spare inventory.
- Organize damaged components for disposal through Synetic.
- Review Apple's published repair manuals to ensure repair compliance.
- Review GSX repair notices for updates to processes and procedures.
- Complete courses in the Apple Technical Learning Administration System (ATLAS).
- Identify areas to improve the efficiency of the overall repair process.

Technical and Field Support

Primary Focus

- **WebHelpDesk (WHD)** - WHD allows ICT to identify, document, prioritize, and route support requests. WHD is the entry point into ICT for customers requesting support and provides insight as to when and where face to face support is needed. Almost 59,000 tickets were entered into WHD during the 2017-2018 school year. Technical and Field Support is responsible for:
 - Daily administration and management.
 - Creating, testing and implementing automated workflows .
 - Processing and resolution of requests entered, averaging more than 200 per day.
 - Prioritizing requests with the assistance of building administration.
 - Timely and accurate documentation throughout the request's progression from 1st response to request resolution.
 - Escalating requests to other workgroups within ICT.
 - Identifying trends.

Sampling of Other Duties Performed

- Serve as the first line of defense for all technology issues.
- Serve as a technical liaison between the building and ICT.
- Coordinate support coverage and scheduling.
- Provide onsite, personal technical support with easy accessibility to staff and students.
- Educate staff and students on applications, devices and processes.
- Perform hardware installation, replacements and upgrades.
- Perform software installation and upgrades.
- Conduct advanced hardware and software troubleshooting.
- Install, configure and troubleshoot Apple TV's.
- Install, configure and troubleshoot overhead projector systems.
- Diagnose classroom TV and audio systems.

- Provide technical assistance for high profile district events and meetings.
- Research and recommend hardware specifications based on specific needs.
- Research compatibility of software applications being considered for purchase.
- Coordinate software installations, purchases and licensing with district departments.
- Perform component level repair of Apple and Windows devices.
- Perform building level hardware audits for inventory maintenance.
- Coordinate the surplus of outdated hardware items.
- Create and update district Windows software images.
- Document and publish FAQs for patron or technical consumption.
- Document processes and procedures for consistency.
- Plan, implement and execute summer projects.
- Collaborate via Webex on current issues and best practices.
- Identify professional learning opportunities.
- Pursue relevant, industry recognized certifications.

Teaching and Learning Services

Primary Focus

- **Apple School Manager (ASM)** - ASM allows ICT to deploy iOS, macOS and tvOS devices. ASM is used in conjunction with our mobile device management platform, Mosyle, to configure device settings and purchase and distribute apps. ASM also integrates with Skyward to provision accounts, rosters and classes. Within ASM, the Device Enrollment Program (DEP) component automates the initial setup of a device. District enrollment and supervision is completed without requiring ICT staff to touch each device. Teaching and Learning Services is responsible for:
 - Daily administration and management.
 - Syncing ASM with Skyward.
 - Class data for more than 18,000 classes.
 - DEP tracking of device ownership for more than 36,000 devices.
 - App purchases and maintenance.
 - Maintain 6,000,000 licenses for the 1:1 app library.
- **Mobile Device Management (MDM)** - MDM allows ICT to deploy and manage iOS, macOS and tvOS devices. Our MDM, Mosyle, is used in conjunction with ASM to configure device settings and distribute content based on user, grade, class and even school. A MDM solution such as Mosyle is critical to the safety and compliance required of educational technology. Teaching and Learning Services is responsible for:
 - Daily administration and management of the district's MDM platform.



- Syncing Mosyle data with Apple School Manager.
- Syncing Mosyle data with Active Directory.
- Class data for more than 18,000 classes.
- App assignment and distribution of more than 700 unique apps.
- Content assignment and distribution.
- Configuration profile creation, distribution and maintenance.

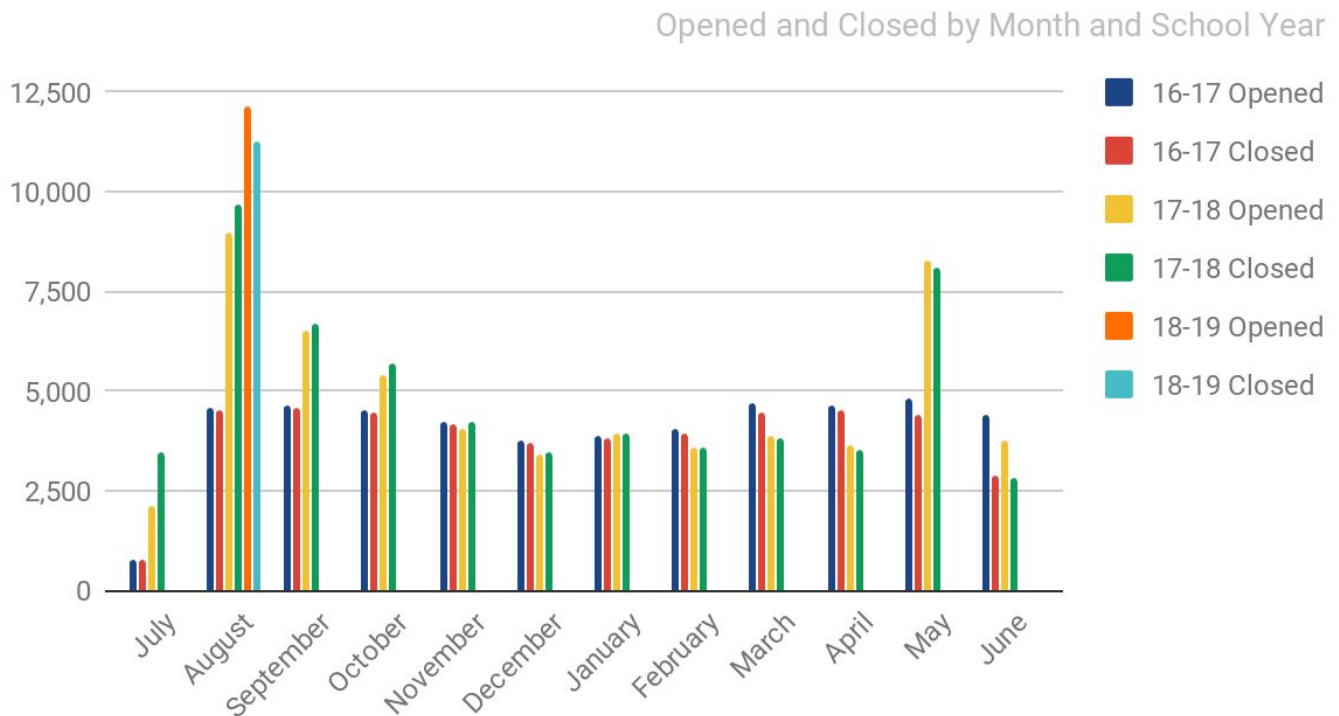
Sampling of Other Duties Performed:

- iOS Configuration.
- macOS Configuration.
- iOS software requests.
- macOS Software requests.
- Software compatibility testing.
- Software packaging for automated installation through the MDM.
- Partner with vendors to troubleshoot software configurations unique to our environment.
- Author and maintain a library of custom Bash and Apple scripts used to further automate MDM tasks.
- macOS device setup procedures and continued testing.
- iOS device setup procedures and continued testing.
- Maintain 20 Caching Servers that supply data such as OS updates, iTunes Purchases, and App Store purchases.
- Serve as the primary contact for the district's Apple Premium Support agreement.
- Serve as the primary contact for the district's MDM provider, Mosyle.
- Provide direct support for SpEd devices with unique configurations.
- Provide support for single purpose targeted devices.
- Deliver escalated support to analysts and customers.

Data Visualizations

The following data visualizations for the Customer Services concentration are based on the most recent data available. As discussed previously, consistent, longitudinal data is still in the process of being collected for the relatively new technology environment paradigm.

WebHelpDesk Tickets Summary

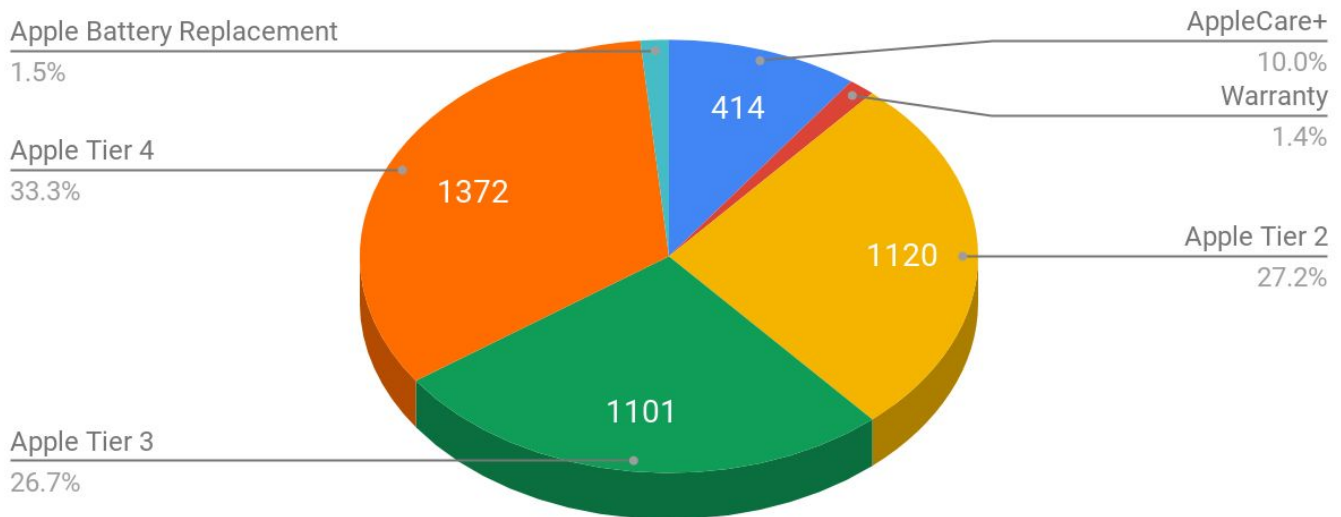


This chart represents support requests submitted and resolved through the WebHelpDesk ticketing system. The data represents tickets for all workgroups within ICT.

- 46,337 tickets were resolved during the 2016-2017 school year
- 58,946 tickets were resolved during the 2017-2018 school year

Service Desk Apple Repairs

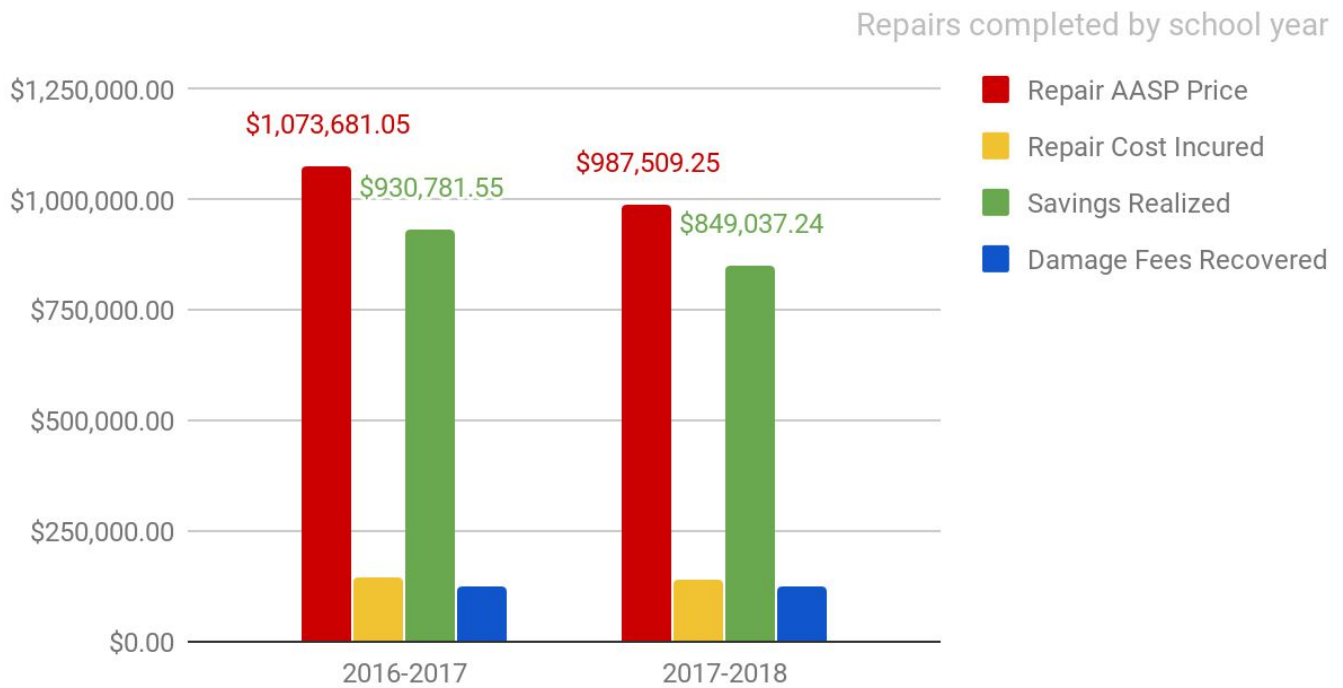
4,125 repair tickets were completed from 7/1/2016 - 6/30/2018



This chart represents repair tickets completed, by repair type. Apple uses a tiered model to account for the level of repair needed. For example, a Tier 4 repair requires more time, parts and is costlier to complete than a Tier 1 repair.

To complete repairs of Apple devices, our technicians must be Apple certified and adhere to strict repair guidelines from Apple. Customer Services currently has 13 Apple Certified Mac Technicians (ACMT) and 11 Apple Certified iOS Technicians (ACiT). Customer Services must comply with strict guidelines set forth by Apple to maintain eligibility and membership in the Apple Self-Servicing Account (SSA) program.

Service Desk Repair Savings Comparison



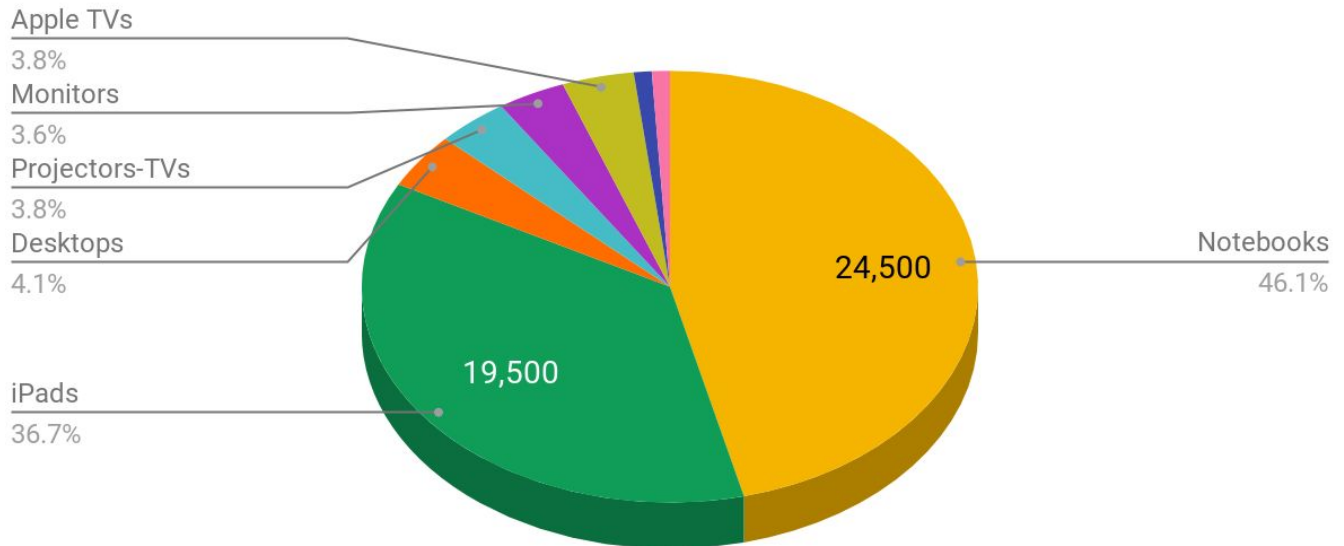
This chart represents the cost comparison of the Apple device repairs completed at the ICT Service Desk against the cost of having those same repairs completed out of district at an Apple Authorized Service Provider (AASP).

- 2,093 repairs were completed during the 2016-2017 school year
- 2,032 repairs were completed during the 2017-2018 school year

With an Apple Self-Servicing Account, repairs must be completed with genuine Apple parts. A dedicated diagnostic server is administered to validate repairs and accurately diagnose hardware issues. Repairs are completed in accordance with Apple standards thereby maintaining the reliability of the device and the integrity of the user experience. Warranties remain in tact and a greater resale value is realized at the time of disposition.

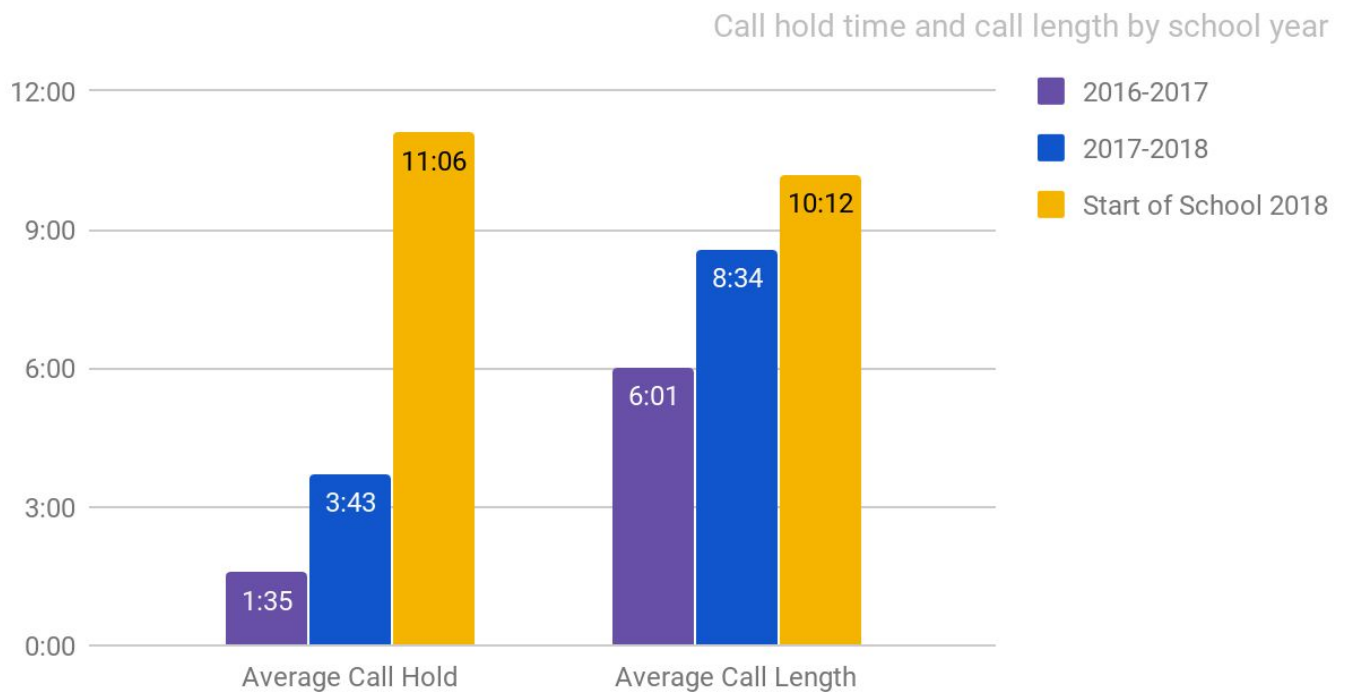
Asset Types and Quantities Supported

Over 300 unique models of hardware and 53,000 assets supported



This chart represents the types of assets supported throughout the district. Quantities have been rounded to the nearest one hundred. Printers, copiers and mobile carts are not visible in the chart above but account for 2.9%.

Help Desk Call Times

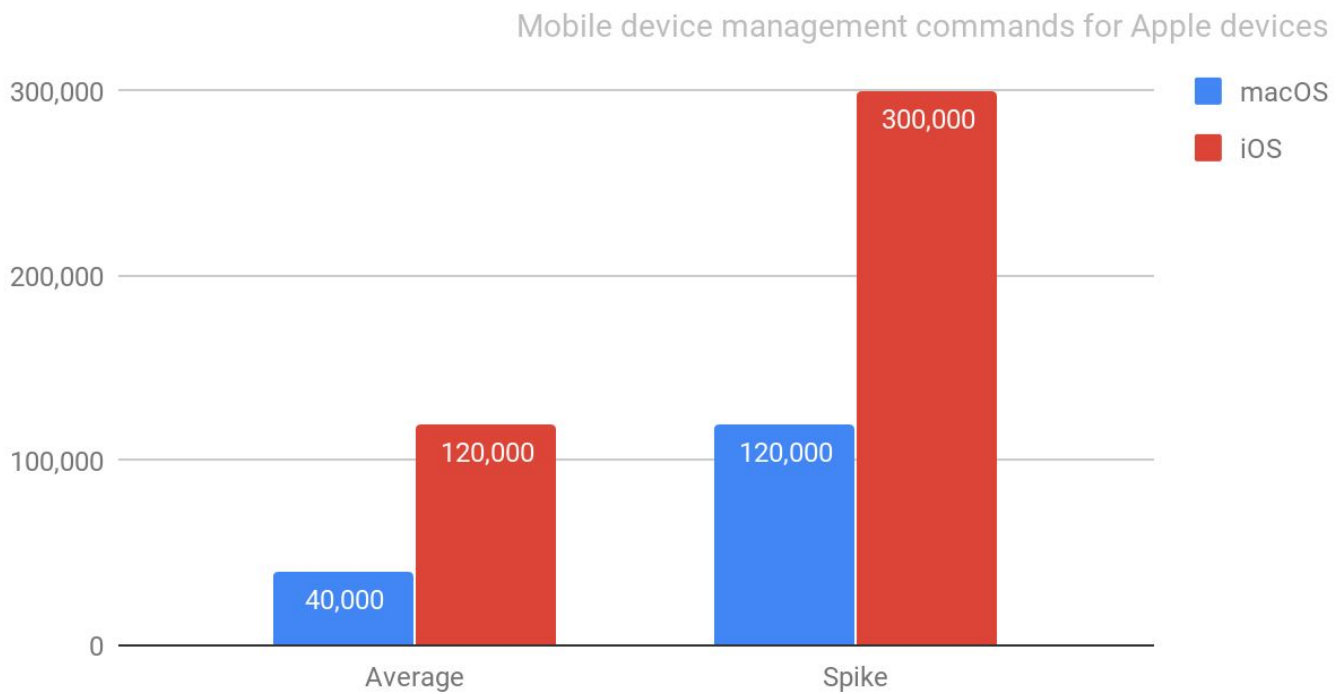


This chart represents the average amount of time needed to answer a call and the length of the call once answered.

- 6,920 calls were answered between 8/1/2016 and 7/31/2017
- 8,514 calls were answered between 8/1/2017 and 7/31/2018
- 1,185 calls were answered from 8/1/2018 - 9/1/2018



MDM Commands Issued Daily



This chart represents the number of commands issued to Apple devices managed by ICT through our mobile device management (MDM) platform. Quantities have been rounded to the nearest ten thousand. These commands provide district defined configuration settings to the devices and allow safe, secure access to resources.



Evaluators

1. **Dr. Rick Atha, Associate Superintendent of Organizational Support.**
2. **Drew Lane, Executive Director of ICT.**
3. **Bill Shaffer, Director of Network and Technical Services.**
4. **James Morgan, Director of Data and Programming Services.**
5. **Doug von Mosch, Supervisor of Customer Services.**

Program Goal

By safeguarding the technology environment with the pragmatically least restrictive protocols, practices, and policies ICT will provide a safe, reliable, and efficient technology environment in which all users have the tools necessary to facilitate learning, engage in learning, and administer the day-to-day business of the district.

Evaluation

By safeguarding the technology environment with the pragmatically least restrictive protocols, practices, and policies ICT will provide a safe, reliable, and efficient technology environment in which all users have the tools necessary to facilitate learning, engage in learning, and administer the day-to-day business of the district.	
<u>Area(s) of Impact¹⁵</u>	<u>Activities and Engagement¹⁶</u>
Infrastructure Capacity; 1:1 Initiative	Improve critical district infrastructure to facilitate educational, business, and support services of the district. Provide improvements, ongoing monitoring, and capital outlay planning to maintain adequate infrastructure.
Infrastructure Capacity	Evaluate and improve the district data center and implement a district disaster recovery plan and location.

¹⁵ Area(s) of Impact are from ICT work performed per the current district strategic plan.

¹⁶ Activities and Engagement are summarized from goal progress per the current district strategic plan.

Sustainable, Efficiency Driven, Return on Investment	Implement all components of the Cisco Security ELA to create a highly secure data and network environment for the district.
	Engage in a process to fully implement a new Employee Resource Planning platform (BusinessPlus).
Curriculum Integration, 1:1 Initiative, Efficiency Driven, Return on Investment, Visionary, Expanded Learning Opportunities, Alternative Scheduling	Engage in a pilot Virtual Desktop Infrastructure (VDI) initiative to allow students access to expanded learning opportunities that are currently limited by physical location in a specific lab in a specific building.
Professional Development, Return on Investment, Expanded Learning Opportunities	Implementation of a sustainable, ongoing classified personnel training program.
Fiscally Responsible, Infrastructure Capacity	Engage in a process to fully implement an improved time tracking system for employees.

Conclusions

The key aspects of an evaluation process are the conclusions reached. The conclusions reveal what is working well, what is working but can be better, and what needs immediate improvement. The evaluators in this process have reached the following conclusions.

What is Working Well

1. Technical, Network, and Security Services:
 - a. Network Resiliency.
 - b. Wireless/Wired Connectivity.
 - c. Troubleshooting process and procedures .
2. Data and Programming Services:
 - a. Collaboration and teaming on tasks and projects.
 - b. Streamlining processes and security access.
 - c. Developing testing teams in development for enhancements/upgrades.
3. Customer Services:
 - a. Allocation of available resources to address support requests.
 - b. Problem solving a wide array of symptoms and causes.
 - c. Communication and collaboration within the workgroup.
4. ICT general:
 - a. Culture and climate.

- b. Solid strategic vendor partnerships that provide agile responsiveness to district needs.
- c. Solid practices that make security an integrated part of every function performed by ICT.

What is Working but Can be Better

- 1. Technical, Network, and Security Services:
 - a. Disaster Recovery.
 - b. Change Documentation.
- 2. Data and Programming Services:
 - a. The use of change management procedures within our current toolset.
 - b. Documentation of cross-teaming processes and data flows.
- 3. Customer Services:
 - a. Documentation of processes and procedures.
 - b. Development of individualized skill sets to add value .
- 4. ICT general:
 - a. Intra-departmental coordination and change management (adopt ITIL¹⁷ based processes).
 - b. Consistent, clear, and timely information to customers.

What Needs Immediate Improvement

- 1. Technical, Network, and Security Services:
 - a. Clear intra-departmental communication regarding work to be performed and potential impact to customers during existing and established maintenance window.
- 2. Data and Programming Services:
 - a. Automated and more timely data regarding critical building level reporting.
- 3. Customer Services:
 - a. Reduction in call wait times, abandoned calls and first response times. Process and procedures continue to be refined and streamlined to maximize efficiency, but significant reduction in these areas is a function of increasing staffing.
- 4. ICT general:
 - a. Fundamental understanding of classroom tech needs.

¹⁷ Formerly an acronym for Information Technology Infrastructure Library, this is a set of detailed practices for IT service management (ITSM) that focuses on aligning IT services with the needs of business. In its current form (known as ITIL 2011), ITIL is published as a series of five core volumes, each of which covers a different ITSM lifecycle stage. Although ITIL underpins ISO/IEC 20000 (previously BS 15000), the International Service Management Standard for IT service management, there are some differences between the ISO 20000 standard, ICT Standard by IFGICT and the ITIL framework.

Future Focus

ICT will be focusing on the following in the near, intermediate, and long term:

1. Technical, Network, and Security Services:
 - a. Internet services RFP.
 - b. Data Center network redundancy.
 - c. Website consolidation.
2. Data and Programming Services:
 - a. Enhance and expand iOS app development as well as expanded OS and tvOS app development.
 - b. Business Intelligence for data analytics.
 - c. Expand CDD¹⁸ reporting and improve workflows in BusinessPlus.
3. Customer Services:
 - a. Data driven support models and schedules.
 - b. Identify additional methods of requesting and providing access to support - e.g., chat.
4. ICT General:
 - a. Strategic capital outlay plans for every aspect of capital spending managed by ICT.
 - b. Adoption and implementation of additional intelligence around current data analytic practices.
 - c. Objective evaluation of customer service provided.
 - d. Engagement in the new strategic planning process and achievement of goals set forth in the finalized strategic plan.

¹⁸ Provides information to HR and Finance that they don't see in BusinessPlus by default. These are essentially customized views and reports built by ICT for HR and Finance customers.