

A Low-Code Web Application for the Collection of Computed Tomography Quality Control Data

David Coll Segarra PhD; Saskya Arias Soriano MS; Eugene Mah PhD; Kelly Howard MBA, BHA, RT(R),
Sameer Tipnis PhD; Jonathon A. Nye PhD
University of South Carolina, Charleston, SC

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INTRODUCTION

Problem/Opportunity

- CT quality control (QC) data for regulatory compliance are currently captured on a paper forms
- Data review by physicists is challenging at ambulatory sites
- Missing or incorrect data are not reviewed timely or are missed.

Purpose

To create a simple web application for collecting quality control data from computed tomography systems that provides basic analytics and manages physicist approvals.

Potential Value/Benefits

- Eliminate paper-based QC tracking
- Real-time capture with time stamping
- Remote access and auditing of reports
- Immediate feedback on abnormal results
- Built-in analytics and compliance tracking

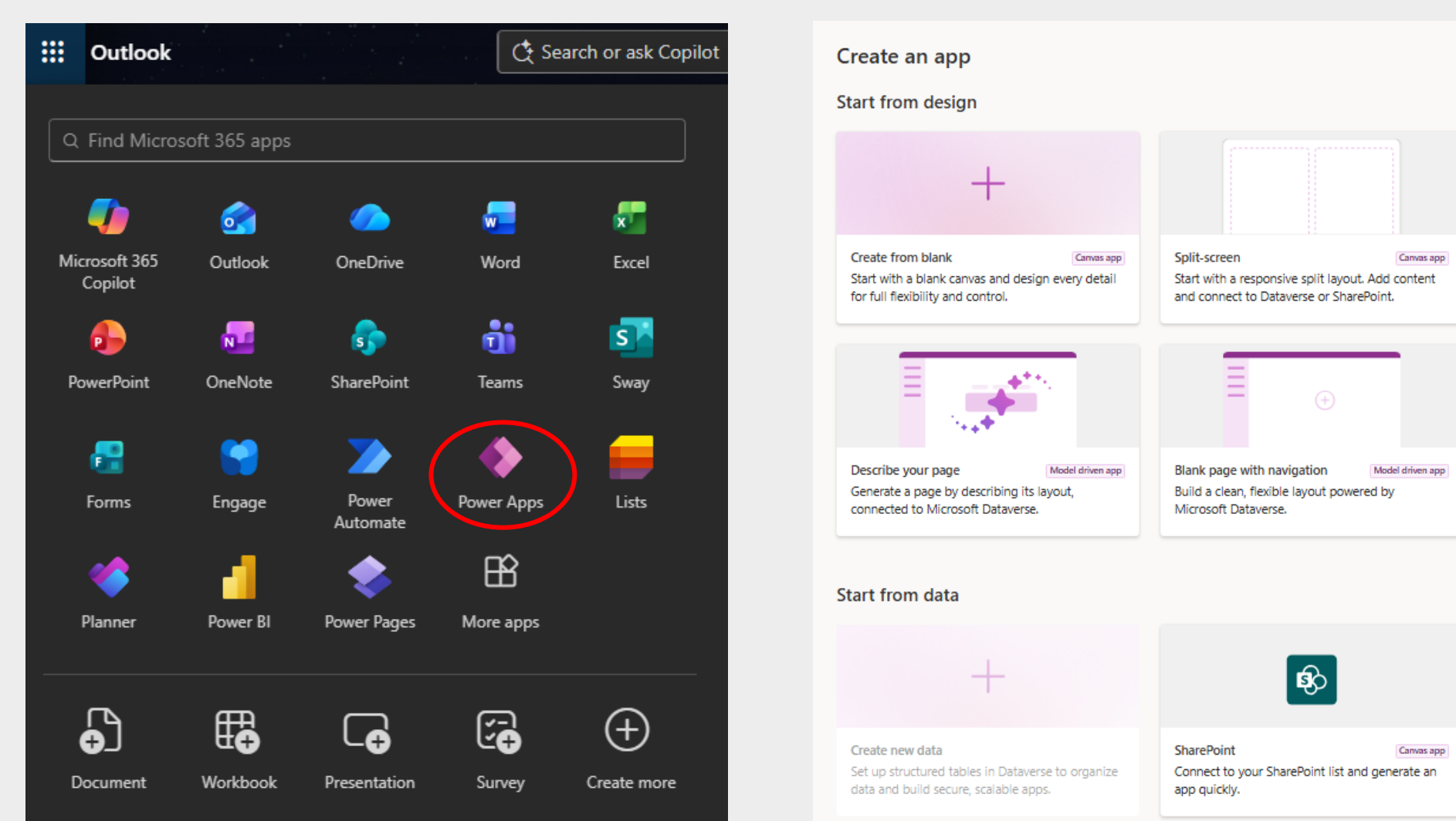


Figure 1. (Left) Power Apps icon accessed from the MS365 app launcher. (Right) Power Apps creation screen.

METHODS AND MATERIALS

- A web-accessible application (web-app) was created in the low-code Microsoft Power Apps environment
- Users access the app using their institutional NETID
- The web-app uses our institution's standard power app licenses
- The data entry pages were designed to look like the ACR's CT QC worksheet
- In addition to QC entries, the web-app tracks who made the entries
- MS Approvals was used to push monthly data to the medical physicist for review

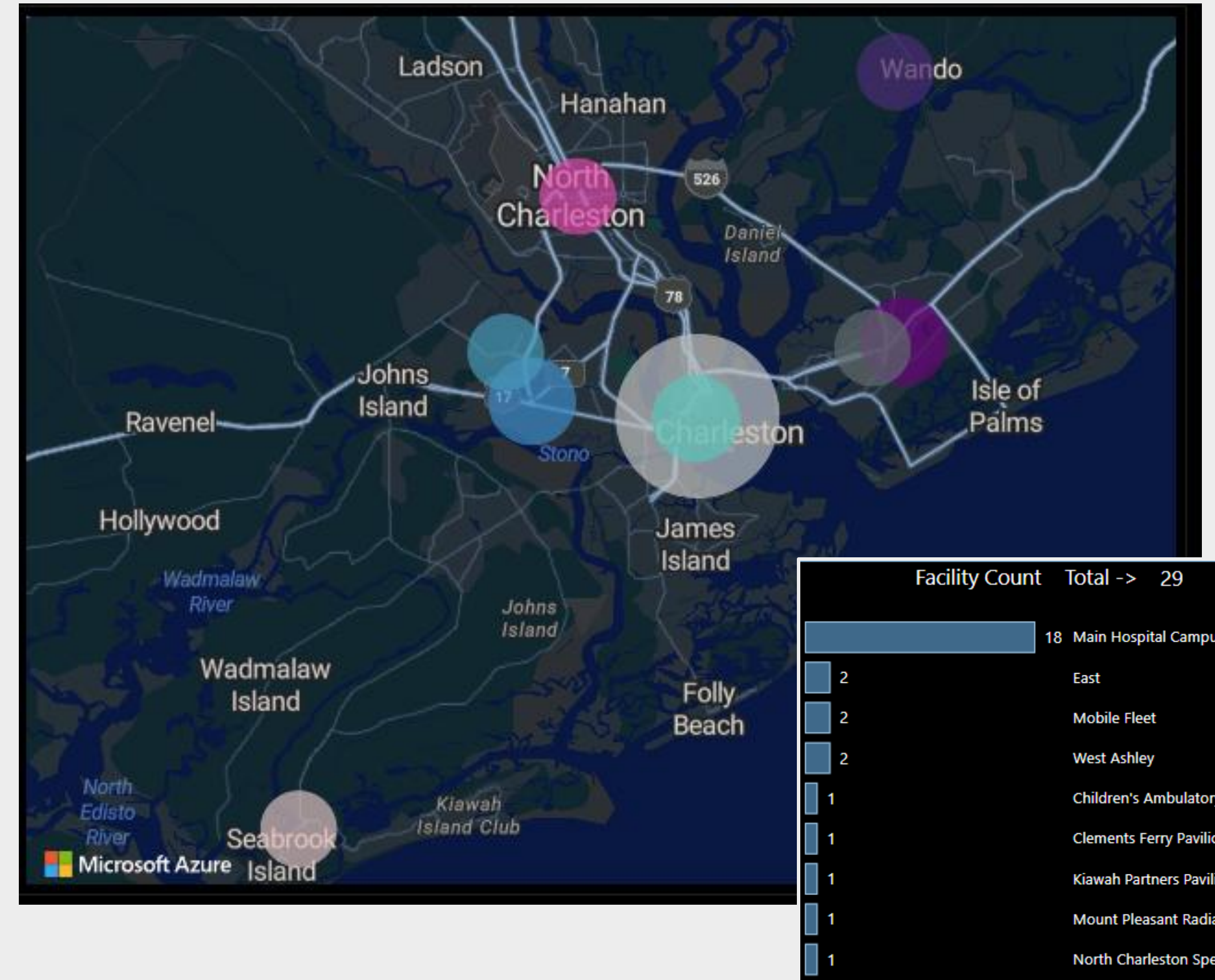


Figure 2. Location and number of installed computed tomography units at the Medical University of South Carolina (incl. CT as part of PET and SPECT)

RESULTS

- The Power App Community Plan license is available to all persons employed at MUSC
- Data are stored in SharePoint lists and managed entirely by the web-app
- There are no added costs for the app deployment or data hosting
- Data is available real-time including trend lines, missing entries, and compliance (Fig. 4)
- Smaller ambulatory sites adopted the web-app faster, whereas more management was needed at complex high-volume sites

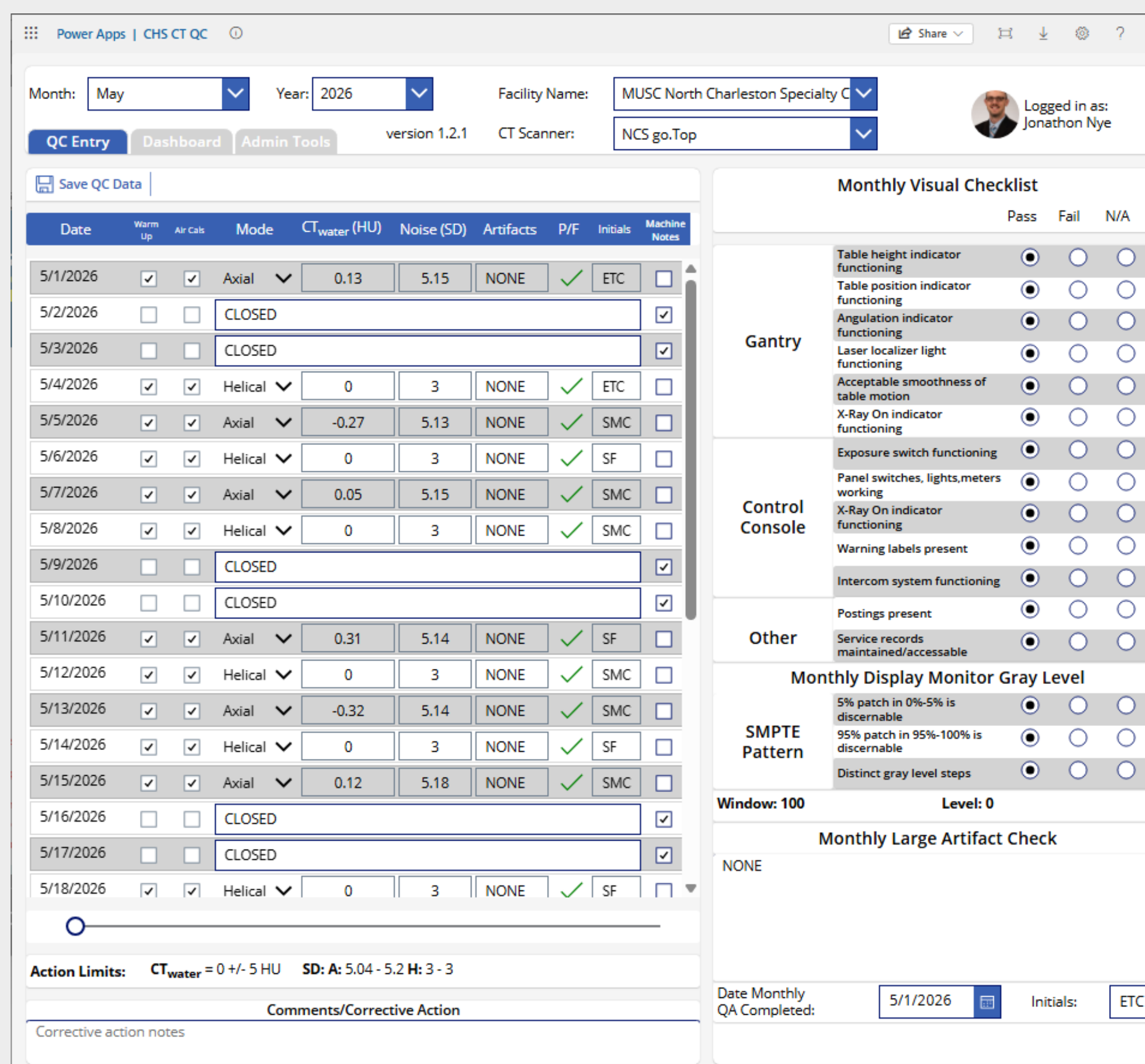


Figure 3. Main data entry screen of the web-app.

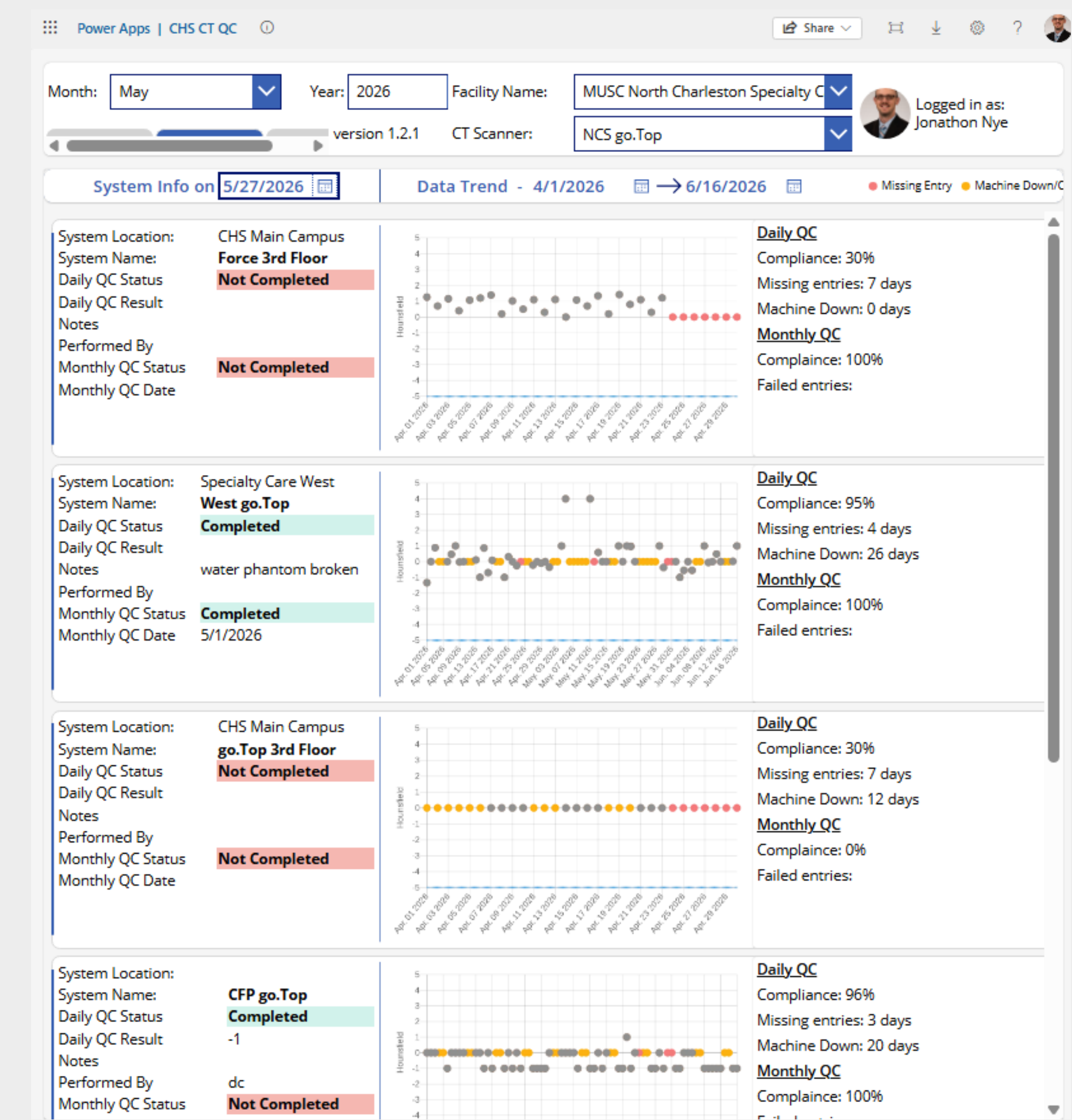


Figure 4. Web-app analytics page that shows one data card for each CT system including a trend line and percent compliance

DISCUSSION

- The Power Apps platform allowed for quick web-app development and deployment
- In-app administrative tools support ongoing updates and addition of new machines
- MS Approvals app for Medical Physicist review arrives by email or is accessible through MS Teams
- Digitizing the CT QC process does not solve ongoing problems with missed entries, copying of prior entries and other challenges.
- CT QC web-app has been added to technologist on-boarding to help with faster adoption

CONCLUSIONS

- Radiology administrators have embraced online CT QC data collection because of its efficiency and real-time reporting
- The web-app resides entirely in the MS 365 cloud and is accessible on tablets and phones
- Leveraging the MS 365 tools has avoided added licensing costs or yearly software fees common with third-party providers

CONTACT

Jonathon A. Nye Phd
Medical University of South Carolina
99 Jonathan Lucas Drive, Charleston, SC
29425
jan301@muscd.edu