

Monitoring and Management of Classroom Audio Video Technology Using Crestron Fusion

Benjamin T. Bassett

Douglas E. Dow, Johanna Pierson

Many of the learning spaces across a typical college campus are equipped with presentation technology to aid the learning process. These tools such as televisions, projectors, microphones, and document cameras should be monitored and maintained to ensure that they remain operational for classes. Outages of these systems can cause significant disruptions to the student's ability to learn. To ensure effective utilization of classroom technology it is important that systems can be monitored and confirm all equipment in a room is functioning as designed. Analytics of classroom equipment utilization can aid in creating more efficient maintenance schedules, and better tracking of system assets. This information can also be used to assist project managers when deciding what equipment to include during space renovations or new construction. As technologies change and are no longer as widely used, they can be phased out to allow for new and more innovative technology that better supports the needs of students. Analog monitoring methods that require manually checking each space or waiting for requests to repair an already broken system are inefficient and can leave rooms with broken equipment. This causes disruptions to the learning process in the classroom. By monitoring parameters of the classroom audio video (AV) systems, usage and functional data can be collected and utilized to determine the availability, operational status, and usage of these spaces. This information can enable university employees to act proactively to complete system repairs before failures are reported or noticed by students and faculty. To facilitate real time system monitoring, it is possible to connect the individual control systems in each classroom to a central monitoring solution. Once each system is connected, various parameters such as projector lamp life,

microphone volume, and status reports from other assets can be reported back to the server. This data can then be analyzed to find trends in room performance or trigger alerts when a system is not meeting specified parameters. Crestron (Rockleigh, NJ, USA) provides enterprise control and automation solutions for AV equipment. One of their products permits system monitoring across a large network of AV equipped spaces. This product is Crestron Fusion, and it enables monitoring of connected systems, scheduling of services such as repairs and alerts for AV technicians. The purpose of this project is to utilize the Crestron Fusion service to track information about a room's AV system, such as lamp hours, microphone battery levels, and room occupancy. This information would be saved to a centralized database and would be available for analytics, monitoring, and generation of alerts when needed. Such a system would improve the ability to monitor classrooms' operational status, maintenance cycles, and appropriate usage. Additionally, Fusion can allow technicians to access a virtualized control panel to interact with the control system installed in the room. This virtual control panel can be operated remotely and, depending on network typology and security, can allow technicians to control the equipment in learning spaces without being physically present. Not needing to dispatch staff to physical locations for simple system restarts or overrides can dramatically decrease the cost of maintaining these systems. The scope of this project will focus on monitoring basic functions of classrooms as this data alone can provide many insights into how a room is utilized. Later this project can be expanded to include more advanced functions of the Crestron Fusion software, such as room presents based on calendar information, management of in-room recording technology, and live interaction with a help desk.