Overview
Most issues inside a printer can be detected by sensors; however, sensors are very expensive and it would not be cost effective to place enough sensors within the printer to detect every possible problem. Currently, when a printer breaks, a service representative must manually find the issue if it is not found by a sensor, which takes some time. Our device needs to decrease the time that it takes to find the issue.

Objectives
The remote diagnostic camera tool will greatly reduce the time it takes to diagnose where the problem is occurring. The device will allow a service representative to view a live stream from inside the printer and run image diagnostics on the video to determine if the error lies with a registration mark printed on the paper or the paper edge shifting position.

Approach
- Visited Xerox facility to gather a more detailed problem statement, specific design requirements, and a testing device for our tool.
- Determined two specific areas for team members to work on: application and camera development.
- Researched and decided what hardware was best for the specific requirements.
- Acquired all hardware, including a Samsung Galaxy Tab 3, a Raspberry Pi, and Raspberry Pi Camera.
- Configured the Raspberry Pi and Raspberry Pi Camera to stream images to the Android tablet directly using the tablet’s WiFi hotspot feature.
- Wrote an application for the Android tablet that will allow the service representative to easily view the live stream and run image diagnostics on the images.
- Developed an image processing feature that will determine paper edge, registration mark, and mark-sensor deflection.
- Tested the camera device and application using the paper feeder device given to us by Xerox.

Outcomes
Our device will help service representatives quickly assess problems within the printer.
- The device quickly connects and streams to the tablet without any manual configuration.
- The diagnostic capabilities will stop the service representative from having to guess where the problem is occurring.
- The device is easily placed almost anywhere within the printer.
- The tablet has the capability of connecting to multiple devices to allow simultaneous viewing of different streams.
- This will ultimately save Xerox time and money.