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Project Proposal

I work for a medical device start-up company. Part of our offering is a wearable device, a patch worn on the torso of the users’ body. The user wears this patch for up to a week. From the time the patch is turned on, it is collecting the following data:

* Pill ingestion events. Every time a person ingests a pill containing a microchip my company has manufactured, this patch detects it.
* Impedance calculation, indicating the quality of the patch to skin contact
* Physiological data about the user:
  + Heart Rate
  + Body Angle
  + Steps
  + Ambien Temperature
* Event logs of the wearable device including:
  + Firmware version history
  + Patch activation, button presses, run mode, operational time limit, manual power down etc.

I’m planning to categorize the history and failure rates of my company’s wearables. The story of the patch comes together by analyzing what events occurred when, and in what sequence.

* Some of the stories and failure rates are straight forward Ex: the patch was worn for 7 days, reached its operational time limit, and shut down. Ex: the patch entered a known error state, recorded the event record.
* Many of the stories are more complicated. Ex: The patch indicates it was turned on, but the impedance values indicate it was not on the body. Was this a user error, was the patch accidentally turned on during shipping? Ex: the patch abruptly stopped with no obvious indication why. From deeper analysis in to these logs, we can answer these questions.
* Some of the stories we will be new to us, and we won’t know what to look for

I would like this to be automated. We have patches coming in by the hundreds, if all goes well we will get them coming in by the thousands.

* Data comes in one of two ways:
  + Directly pulled from the patches themselves. Binary files converted to .txt files
  + Directly pulled from the cloud
  + Files look slightly different, and some cleaning of both to make them uniform will be required. Both forms can be converted to csv files and then processed