# Elevator Anomaly Detection System

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## 1. List 3 questions that you intend to answer (1 point)

1. Using anomaly detection, can we detect when elevators require maintenance before they are completely out of service?
2. How can Internet-of-Things (IOT) practices (accelerometers on elevators) be implemented to explore this task?
3. How can results be presented in real-time? In other words, how can we create a streaming system which indicates that an elevator needs repair using the accelerometer data?

## 2. List all the datasets you intend to use (1 point)

We will be using the large dataset of accelerometer data from Technical Safety BC. We may also explore other elevator related datasets, but these are difficult to come by, and may be hard to integrate with our dataset.

## 3. Give us a rough idea on how you plan to use the datasets to answer these questions. (2 points)

- **Data Collection:** Streaming elevator data using accelerometers.
- **Data Exploration:** We will be performing EDA to understand the current elevator trends and data distribution using the given dataset.
- **Data Cleaning:** Our data consists solely of acceleration readings and timestamps, so it will not be readily usable. We will need to extract features and compare temporal trends, as well as determine what events certain elevator movements pertain to.
- **Data Integration:** The data we expect to receive has information of 15 elevators across BC. We expect to standardize the data by integrating all 15 elevators' data to maintain the consistency and enable better insights for analysis. As our only existing features for this dataset are timestamp and acceleration, feature creation will also be a large aspect of this project.
- **Data Analysis:** We are planning to design an algorithm using Machine learning/ Deep learning concepts to detect anomalies in the elevator data and then perform some analysis to get important information which may be used to enhance safety in elevators.
- **Data Product:** We expect to build a model for good predictive maintenance on elevators. We expect to perform visualization on the different features we extract from our data for better understanding and easy communication of analysis. We also plan on creating a streaming system simulating elevator data arriving in real time.

## 4. Think about that once your project is complete, what impacts it can make. Pick up the greatest one and write it down. (1 point)

Our project has the potential to predict when elevators require maintenance and save money. However, given that elevator incidents have risen recently in Canada, this project may help predict the fatality of the incidents and thus improve safety and precautions when using elevators. It also helps predict the performance of elevators which indicates the quality and maintenance status of the elevators.