Smart Vending Machine Case Study (Final Exam)

You have been tasked with developing the software for the **next generation vending machine** for use at universities.

The vending machine has several unique features that must be developed for the first time in such an application. These features include:

1. The vending machine must be able to accept cash and change, as well as university cash cards, which require a PIN entry when used.
2. The machine will sell food and drink items just like other vending machines.
3. The machine will have a unique ID and a location system that will allow it to know what building it is in.
4. It will also have an advanced theft deterrent and student protection system that will use a camera and record the image of the student for all cash card purchases and also record an image if the machine is being shaken or tampered with which is detected by an accelerometer sensor. During a tamper event, the machine will call campus security and provide site ID of the machine and the photo of the perpetrators.
5. The vending machine will also have a built-in LED screen that will provide several features, including:
   - advertise products based on a sales trends mined from the products database
   - mention upcoming general school events such as drop date, registration, etc.
   - advertise student-customized information and products such as university bills due, bookstore sales, etc. when the student uses their M-Card to buy their product.
6. The system will also interface with a remote distribution center. This system will collect information regarding current product levels and buying trends that will assist in coordinating machine restocking.