Useless Lockbox

Requirements Specification

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**Problem/Need:** Privacy and security have become major concerns in society today. Whether it be a teenager trying to keep a diary hidden or an adult keeping money away from a less than trustworthy roommate, a lockbox is a good way to go. Unfortunately, lockboxes are obvious and sometimes bring with them curiosity as to what is inside. An interesting and elegant way to keep a lockbox without arousing much suspicion is needed.

**Objective:** The objective of this project is to design and prototype an elegant lockbox. The lockbox feature should not be the most distinguishing feature. The lockbox should have some secure way of storing items.

**Proposed Project Background:** Our proposed practicum project is the useless lockbox. A useless machine is a device that has no direct purpose. Most useless machines are simple boxes that have a switch and a moving arm. When the switch is flipped by somebody, the arm moves and flips the switch back to the starting position. This feature will be the distinguishing feature making the lockbox itself less noticeable. The switch will enable a keypad and LCD screen. If the correct passcode is entered a solenoid will activate and the “hidden” lockbox compartment will open. If the passcode is incorrect a moving arm will flip the switch back to the off position.

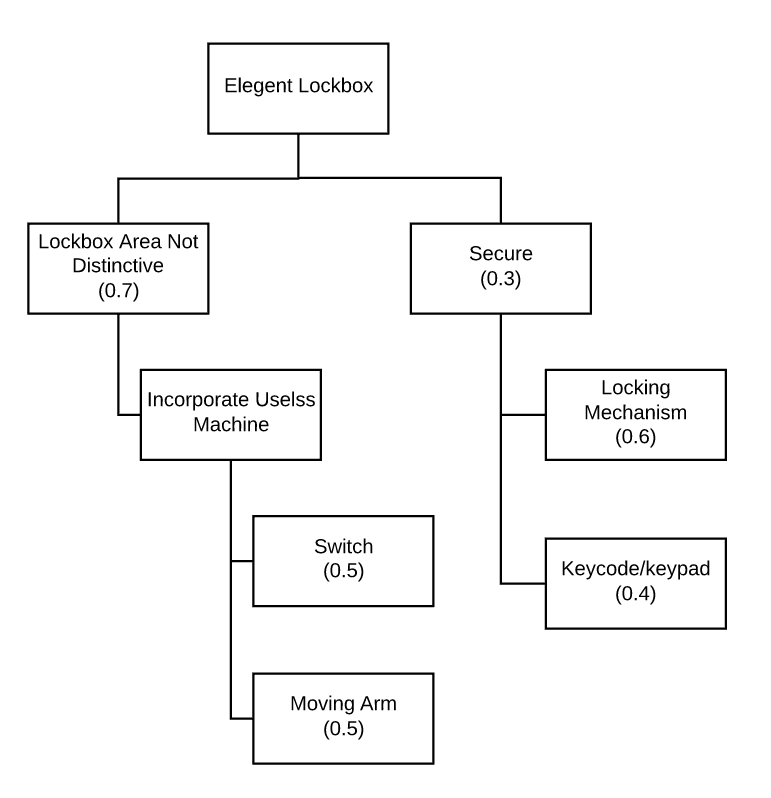


Figure - Decision Tree

**Requirements**

**Functionality:**

* The product acts as a lockbox being secure with a locking mechanism.
* Input: Passcode.
* Output: Locking mechanism and switch mechanism.

**Aesthetics:**

* **The box incorporates a useless machine and not automatically appear to be a lockbox.**
* **The box could be used as a side table decoration.**

**Performance:**

* **The lock box’s door will open within 3 seconds if entering the right passcode.**
* **The switch will disable the system within 5 seconds if entering the wrong passcode.**
* **Life service should be at least a year.**

**Economic:**

* Total development budget for the product will not exceed $150.
* Total parts and manufacturing costs cannot exceed $80 per unit.
* System’s lifetime Cost of ownership will not exceed $10 per month.

**Energy:**

* **The system will use external battery of 9V to operate.**
* **The system operating life with 9V batteries will last up to 2 weeks.**

**Environmental:**

* **The box uses material that is recyclable.**

**Maintainability:**

* **The lock box will permit user-replacement for power supply change and operating board.**

**Manufacturability:**

* **The design must be manufactured on a printed circuit board no larger than 2”x4”.**
* **The printed circuit board must have at least 2 layers.**

**Health and Safety:**

* **The box will not cause harmful to the user while operation or broken down.**

**Operational Physical Environment:**

* Product will have a cubic shape with overall dimensions not exceed 12’’ x 12’’ x 12’’.
* Product’s weight will not exceed 10 lbs.

**Usability:**

* New user should be able to use the product and change product’s power supply in less than 10 minutes.