


# Sociotechnical Synthesis


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With the start of the Covid-19 pandemic, Americans began ordering more goods online. Just between the beginning of March 2020 and the middle of April 2020, ecommerce increased 30% in the U.S.(Rattner, 2020) Coupled with this increase in ecommerce, the U.S. has also seen a large increase in “porch piracy” or packages stolen from people’s porches or front yards after delivery, but before they can be brought inside.(Asymkos, n.d.) Some companies have created smart Internet of Things (IoT) devices that aim to combat porch piracy such as the ring doorbell and other smart cameras. In fact, the number of IoT devices connected to the internet is expected to be several billion in the next few years (Jan Saleem & Ahsan Chishti, 2021). However, many IoT devices contain serious cybersecurity vulnerabilities that allow malicious actors to gain unauthorized access to the IoT devices themselves as well as other devices on the user’s home network. This applies not just to IoT devices aimed at preventing porch piracy, it applies to many of the rapidly expanding number of IoT devices in use throughout the world.

The technical project report details the design, implementation, and fabrication of a multi-tiered user access system. While the system has many use cases, we applied the design to a package delivery box. However, the electronic components can all be removed from the package box and rehoused to use the system in a doorjamb to control access to a room or building. The goal of this package box application is to create a safe delivery area that allows user to receive deliveries that cannot be easily stolen. To accomplish this the system allows the owner to remotely generate individual use and time limited passcodes from their phone while also being able to manage these passcodes and review footage of passcode use. Other products have attempted to solve the “porch piracy” problem through different means. The ring doorbell is a smart home doorbell with a camera that allows the owner to access live time and recorded video of their front porch. While the idea of being filmed stealing may deter some thieves , it does not

prevent the physical act of stealing a package. The system we developed keeps the package secured in a box, which in theory can be constructed to provide a much large barrier to the physical act of theft such as having to physically break open the box.

The STS research paper explores issues surrounding cybersecurity in IoT devices. The paper looks at why IoT devices are more vulnerable to cyber attacks than traditional computers and the social factors that exacerbate these vulnerabilities. These social factors include the lack of consumer education and awareness of security-based issues, especially in the case of IoT devices. In addition, the relatively few laws that regulate cybersecurity standards in the United States do not provide sufficient protection to consumers who have little knowledge that would help them determine what makes an IoT product insecure and how to mitigate those risks. The paper found that the United States needs serious consumer protection regulations for IoT devices that ensure people will be able to use IoT devices safely without having an advanced knowledge of security or information technology.

## References:

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