I. Introduction

Medretur wants to develop a medicine collection system that automates the process of disposing of medicines. The task of this project is to research and find methods for this system to detect and deter intrusion attempts. This chapter presents background information on the research project, including its objectives and limitations. Information is also provided on the company that commissioned the study.

A. Background

The proper disposal of unused and expired medication is a critical public health issue [**?**]. Improper disposal of such medicines can lead to contamination of the environment and potential harm to human health [**?**], [**?**]. Collection programs for unused medicines have been established to address this issue [**?**], [**?**], [**?**], but these programs often face challenges in terms of security [**?**]. This is because these programs deal with sensitive materials that may be valuable to others [**?**].

B. Objectives

The purpose of this task is to find a solution to prevent theft and break-ins in systems for collecting medicines.

The aim of the proposed solution is to allow such systems to operate without the risk of medications being lost or stolen.

The task aims to evaluate different detection and notification methods and create a scaled-down prototype, and then conclude whether or not this solution works.

C. Limitations

Parts of a control system that use the same components as the existing control system in the MediColBox will be constructed.

The full-scale control system will have the same CCU, HMI, and sensor card, but also remote input/output (RIO) for the actuators.

The prototype that will be assembled is a Single-board computer Raspberry Pi 4B 8GB [**?**] as CCU, with a 7-inch touchscreen [**?**] as HMI and a Raspberry Pi Sense Hat v1.0.0 [**?**] as a sensor card. The purpose of constructing the prototype is to use the Inertial Measurement Unit (IMU) in the sensor card.

D. Project Stakeholders

The company **Medretur** is the main target audience. Medretur has a policy to have a long-standing commitment to providing safe and effective waste management solutions to their customers [**?**]. However, the waste management industry is complex and challenging, and delivering a solution that reliably provides this is not easy. The proposed project seeks to help Medretur navigate this complex landscape by developing a new system that will improve the safety and security of their waste management operations. On a long term basis, there will be developed a system that will help to streamline the waste collection process, reduce the risk of human error, and ensure that all waste is managed in accordance with the current safety and regulatory standards.

By implementing this new system, Medretur will be able to reduce the risk of accidents, errors, and other safety incidents, which will help to protect their employees, customers, and the environment. Overall, the solution proposed by Medretur has the potential to provide significant benefits to Medretur and their customers.