Project 4: Home Security System Proposal

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Contents

Chapter 1

Description of Project

1.1 Project Idea

This proposal is for a home security system that is a hardware and software solution. Our company will offer installation services for the system, which is a base station and various POE IP cameras. The storage for the system will be through AWS and there will be a web interface to access the recorded feeds. The monetization will be through a hardware and install fee, and a monthly subscription fee for the AWS storage and web interface.

The hardware will be based of a Raspberry Pie 5, with a Corral Accelerator, and a POE switch. It will all be contained within a custom case that will be mounted to the wall. The cameras will be POE IP cameras that will be connected to the switch and powered by it. The customer will be able to pick various numbers and variations of indoor and outdoor cameras.

The Pie will be running the default version of Raspbian. The open source software Frigate will be used to manage the cameras, feeds, recordings, and detection. The storage will be through AWS S3 mounted locally using Rclone. Frigate will handle the web interface, but there will be a tunnel to the AWS instance so the customer can access the recordings on the web.

The install service will be done by in house contractors. They will visit the customer's home, advise them on number of cameras and camera placement. They will then install the hardware, connect it to the internet, and show the customer how to use the system.

Chapter 2

Likely Marketing Efforts

2.1 Target Audience

Testing Testing Testing

2.2 Cost Expectations

Testing Testing Testing

Chapter 3

Technical Details / Technical Research

A three-tier surveillance security system package specifically designed for family homes. The packages offer different levels of security, from essential home monitoring to advanced surveillance with AI-based detection. Each package includes necessary hardware, software, and storage solutions for easy installation and use. The Coral USB Accelerator is included in all packages to enhance AI-based motion detection and object recognition. Real pricing for PoE switches has also been incorporated. Camera specifications have been adjusted so that the first tier supports either indoor or outdoor use, and the second tier includes both indoor and outdoor cameras.

Tier 1: Essential Home Package The Essential Home Package is designed for families looking for an entry-level yet effective surveillance system. This package includes two cameras that can be used either indoors or outdoors, providing flexibility for home security. Components:

- 2 Indoor/Outdoor PoE Cameras (Reolink 5MP, 2560×1920 resolution, 30 fps) - $70 each
- 1 Raspberry Pi 5 (4GB RAM) pre-installed with surveillance software - $60
- 1 Coral USB Accelerator for AI-powered motion detection - $25.99
- 1 PoE Switch (4-port TP-Link TL-SF1005P) - $40

Features:

- Local storage on Raspberry Pi 5 (up to 128GB via microSD)
- Mobile app access for live viewing
- AI-based motion detection and object recognition using Coral USB Accelerator

Estimated Total Cost: $266

Tier 2: Smart Home Package

This package offers additional security coverage and smart features for homeowners seeking more control over their surveillance system. It includes a combination of indoor and outdoor cameras, ensuring comprehensive security coverage.

Components:

- 2 Indoor PoE Cameras + 2 Outdoor PoE Cameras (Reolink 5MP, 2560×1920 resolution, 30 fps) - $70 each
- 1 Raspberry Pi 5 (4GB RAM) pre-installed with surveillance software - $60
- 1 Coral USB Accelerator for AI-powered motion detection - $25.99
- 1 PoE Switch (8-port NETGEAR GS308PP) - $100

Features:

- Local storage on Raspberry Pi 5 (up to 256GB via external SSD)
- Mobile app access for live viewing and playback
- AI-based human and vehicle recognition for smarter motion detection

Estimated Total Cost: $506

Tier 3: Advanced Family Package

The Advanced Family Package is ideal for families wanting full security coverage with AI-based surveillance features and cloud storage options. This package includes six cameras that can be used in any combination of indoor or outdoor settings.

Components:

- 6 Indoor/Outdoor PoE Cameras (Reolink 5MP, 2560×1920 resolution, 30 fps) - $70 each
- 1 Raspberry Pi 5 (8GB RAM) pre-installed with surveillance software - $80
- 1 Coral USB Accelerator for AI-powered motion detection - $25.99
- 1 PoE Switch (16-port TP-Link TL-SG1016PE) - $180

Features:

- Local storage on Raspberry Pi 5 (up to 512GB via external SSD)
- Mobile app access for live viewing, playback, and two-way audio
- AI-powered motion detection and object recognition using Coral USB Accelerator
- Optional cloud storage integration with AWS

Estimated Total Cost: $826

3.1 Staffing and Salaries

Department Director: $180k—$200k/yr

Software Team:

- **Business Analyst/Scrum Master:** $115k—$130k/yr
- **Software Dev Lead**
  - **Team 1:**
    - **Senior Dev:** $110k—$160k/yr
    - **Junior Dev:** $75k—$90k/yr
    - **Junior Dev:** $75k—$90k/yr
  - **Team 2:**
    - **Senior Dev:** $110k—$160k/yr
    - **Junior Dev:** $75k—$90k/yr
    - **Junior Dev:** $75k—$90k/yr

Systems Team:

- **Systems Administrator:** $68k—$120k/yr
- **Network and Security Lead:** $120k—$140k/yr
  - **Network and Security Specialist:** $100k—$120k/yr
- **Helpdesk Lead/External Liaison:** $50k—$60k/yr
  - **Helpdesk Specialist:** $30k—$40k/yr
  - **Helpdesk Specialist:** $30k—$40k/yr
  - **Helpdesk Specialist:** $30k—$40k/yr

Chapter 4

Defined Goals / MVP

The end product is a home security system and hardware solution that we offer install services for. The package to the user will be home base station that has a POE switch, and varying IP cameras to connect to it. The storage for the system will be through AWS and the there will be a web interface to access the recorded feeds. The monetization is through a hardware and install fee, and a monthly subscription fee for the AWS storage and web interface.

Chapter 5

Testing to be Performed

Requirement	Test Case	Test Result	Defect/Error
Req 1	Test Case 1		
Req 2	Test Case 2		
Req 3	Test Case 3		
Req 4	Test Case 4		
Req 5	Test Case 5		
Req 6	Test Case 6		
Req 7	Test Case 7		
Req 8	Test Case 8		
Req 9	Test Case 9		
Req 10	Test Case 10		
Req 11	Test Case 11		
Req 12	Test Case 12		
Req 13	Test Case 13		
Req 14	Test Case 14		
Req 15	Test Case 15		
Req 16	Test Case 16		
Req 17	Test Case 17		
Req 18	Test Case 18		
Req 19	Test Case 19		
Req 20	Test Case 20		

Chapter 6

Summary of Proposal

Testing Testing Testing

Chapter 7

Timeline and Budget

7.1 Timeline

7.2 Budget Estimates

Cost estimates are divided into hardware, storage/software, licensing, human resources, developer labor, installer labor, employee benefits, vehicle cost, and damage allowance.

Hardware consists of the Pi 5, costing $150 dollars (including shipping). Cameras, the average customer will buy 4 1080p cameras valued at 100 dollars each. The Coral TPU and the M2 accelerator key cost $100 together. The POE switch will cost 50 dollars, and another 50 dollars for cabling, mounting equipment, etc.

Storage cost refers to the AWS storage cost for 4 cameras in 1080p, with the predetermined storage. This is estimated to be $96,000 a year. Software is $0 outside of storage costs. Licensing includes electrical contractor licenses for 3 installers, $600. Business license, $100. Home Improvement Contractor license.

Item	Cost
Hardware	$1,200,000
Software	$0 AWS bills to the customer for storage and interface.
Licensing	$200 electrical contractor licenses for 3 installers. $600
Human Resources	$60,000 for the year.
Developer Labor	$ for the year.
Hardware	Each unit with the average number of cameras(4), cabling, and the computers $
Software	$96,000
Licensing	$600.
Human Resources	$60,000 for the year.
Developer Labor	$ for the year.
Total	$

$1095.

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