UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FACULTY OF INFORMATION &COMMUNICATION TECHNOLOGY

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BITI3533 ARTIFICIAL INTELIGENCE PROJECT MANAGEMENT

FIRE DETECTION USING COMPUTER VISION

FINAL REPORT

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1.0 Defining Project

1.1 Project Summary

a) Customer

Tech-Solution

b) Project Name

Fire Detection using Computer Vision

c) Team Members

- Nur'Ain Najiha binti Zakaria (Project Leader)
- Nur Izzati binti Shafie
- Megala d/o Sontulom

d) Objective

- To detect fire by using the computer vision technology that will alert people by early detection of fire.
- To protect human lives, material assets and the environment from the dangers and the effect of fire.
- To detect fire with a different approach rather than using an existing system.

2.0 Planning the Project

2.1 Project Management Life-Cycle

a) Work Breakdown Structure (WBS)

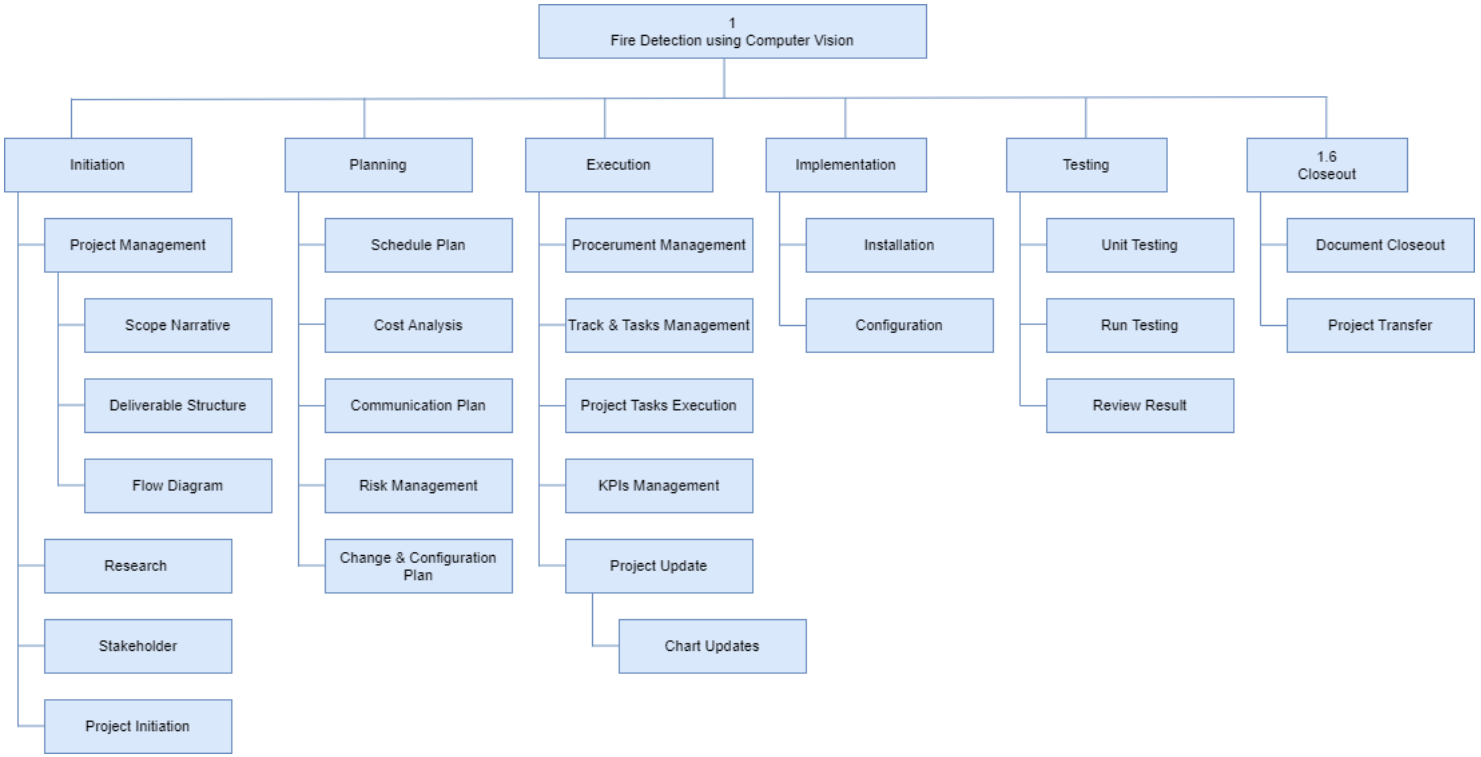

Figure 2.1 (a) WBS

b) Gantt Chart

	Name	Duration	Start	Finish	Predecessors	Resource Names
1	Start	0 days	11/11/20 8:00 AM	11/11/20 8:00 AM		
2	**PROJECT INITIATION**	**99 days**	**11/11/20 8:00 AM**	**3/29/21 5:00 PM**		
3	Project Management	10 days	11/11/20 8:00 AM	11/24/20 5:00 PM		Megala
4	- Scope Narrative	3 days	11/25/20 8:00 AM	11/27/20 5:00 PM	3	Ain
5	- Deliverable Structure	5 days	11/30/20 8:00 AM	12/4/20 5:00 PM	4	Izzati
6	- Flow Diagram	5 days	12/7/20 8:00 AM	12/11/20 5:00 PM	5	Izzati;Megala
7	Research	45 days	12/14/20 8:00 AM	2/12/21 5:00 PM	6	Ain;Izzati;Megala
8	Stakeholder	14 days	2/15/21 8:00 AM	3/4/21 5:00 PM	7	Ain;Izzati;Megala
9	Project Initiation	17 days	3/5/21 8:00 AM	3/29/21 5:00 PM	8	Ain;Izzati;Megala
10	**PROJECT PLANNING**	**38 days**	**3/30/21 8:00 AM**	**5/20/21 5:00 PM**	**2**	
11	Schedule Plan	4 days	3/30/21 8:00 AM	4/2/21 5:00 PM		Ain
12	Cost Analysis	7 days	4/5/21 8:00 AM	4/13/21 5:00 PM	11	Ain;Megala
13	Communication Plan	9 days	4/14/21 8:00 AM	4/26/21 5:00 PM	12	Izzati
14	Risk Management	9 days	4/27/21 8:00 AM	5/7/21 5:00 PM	13	Megala
15	Change and Configuration Plan	9 days	5/10/21 8:00 AM	5/20/21 5:00 PM	14	Ain;Izzati;Megala
16	**PROJECT EXECUTION**	**60 days**	**5/21/21 8:00 AM**	**8/12/21 5:00 PM**	**10**	
17	Procerument Management	3 days	5/21/21 8:00 AM	5/25/21 5:00 PM		Izzati
18	Track and Tasks Management	3 days	5/26/21 8:00 AM	5/28/21 5:00 PM	17	Megala
19	Project Tasks Execution	5 days	5/31/21 8:00 AM	6/4/21 5:00 PM	18	Ain
20	KPIs Management	18 days	6/7/21 8:00 AM	6/30/21 5:00 PM	19	Megala
21	Project Updates	2 days	7/1/21 8:00 AM	7/2/21 5:00 PM	20	Ain;Izzati;Megala
22	- Chart Updates	29 days	7/5/21 8:00 AM	8/12/21 5:00 PM	21	Ain;Izzati
23	**PROJECT IMPLEMENTATION**	**80 days**	**8/13/21 8:00 AM**	**12/2/21 5:00 PM**	**16**	
24	Installation	65 days	8/13/21 8:00 AM	11/11/21 5:00 PM		Ain;Izzati;Megala
25	Configuration	15 days	11/12/21 8:00 AM	12/2/21 5:00 PM	24	Ain;Izzati;Megala
26	**PROJECT TESTING**	**21 days**	**12/3/21 8:00 AM**	**12/31/21 5:00 PM**	**23**	
27	Unit Testing	10 days	12/3/21 8:00 AM	12/16/21 5:00 PM		Ain;Izzati
28	Run Testing	5 days	12/17/21 8:00 AM	12/23/21 5:00 PM	27	Izzati
29	Review Testing	6 days	12/24/21 8:00 AM	12/31/21 5:00 PM	28	Megala
30	**PROJECT CLOSEOUT**	**6 days**	**1/3/22 8:00 AM**	**1/10/22 5:00 PM**	**26**	
31	Document Closeout	4 days	1/3/22 8:00 AM	1/6/22 5:00 PM		Ain
32	Project Transfer	2 days	1/7/22 8:00 AM	1/10/22 5:00 PM	31	Megala
33	Finish	0 days	1/10/22 5:00 PM	1/10/22 5:00 PM	32	

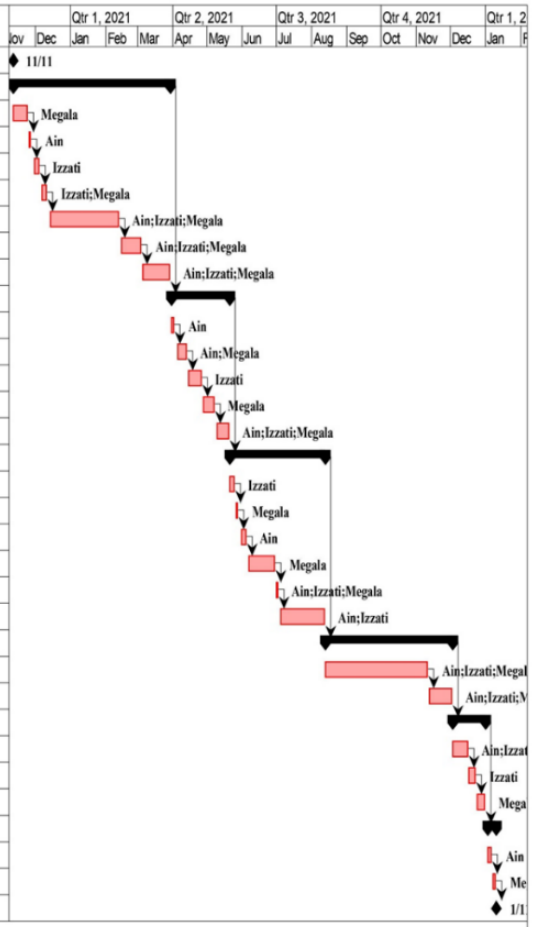

Figure 2.1 (b) Gantt Chart

2.2 Risk Identification Chart

Table 2.2 Risk identification

Measure of Success	Expectations	Guidelines
Time	Has been scheduled realistically and need to be delivered on time.	Stakeholders need to be alert if there are any changes of timeline.
Cost	Using lower cost materials while still making sure the quality is good.	Cost needs to be limited but if additional financial is needed, project manager has to tell the sponsor.
Quality	Need to be top notch to satisfy the customer.	Quality standards have to be followed.

2.3 Responsibility Assignment Matrices (RAM)

2.3.1 Responsibility Assignment Matrices (RAM) Table

Resource Responsibility P - Primary Responsibility A - Approval Authority S - Supporting Responsibility (Contributor or Reviewer) I - Information Only *(Select from drop down list)*	**Project Manager**	**System Designer**	**Programmer**																			
Primary Planning																						
Develop WBS	P	I	I																			
Perform Schedule Planning	P	S	S																			
Plan Risk Management	A	S	P																			
Plan Change and Configuration	A	S	P																			
Execution and Control																						
Manage Communications	P	S	S																			
Manage Procurement	A	P	S																			
Manage Changes	A	S	P																			
Track and Manage Tasks	P	S	S																			
Execute Project Tasks	A	P	P																			
Prepare Test Sites																						
Installation	S	S	P																			
Configuration	S	I	P																			
Conduct Testing																						
Preparation	S	S	P																			
Run Testing	A	S	P																			
Review Test Result	A	S	P																			
Closeout																						
Document Closeout	A	P	S																			
Transfer Project	P	S	S																			

Figure 2.3.1 RAM table

2.3.2 Roles and Responsibility

a) Project Manager

A project manager is a person with the overall responsibility to initiate, plan, design, execute, monitor, control and close a project successfully. The project manager will plan and create the project schedule for the stakeholders and ensure that each phase is implemented, troubleshooting, budget preparation and the process is controlled. The project manager must have the skills to ask pervasive questions, detect unintended assumptions and resolve disputes, and also more general management skills.

b) System Designer

The role of the system designer is to develop a comprehensive plan and guidance that can be provided to the programmers. The main input document used by the system designer is the specification of specifications which the system or business analyst that has created. The system designer is also responsible for drafting test schedules and working with a team of users and system testers to ensure that the system is properly tested.

c) Programmer

The task of the programmer is to define, develop, install and evaluate a software framework that has designed an algorithm and a system using a convolutionary neural network. When the final development environment has been delivered to the programmer, it can also help maintain and update the software and ensure that the security vulnerabilities are solved and that it operates with new databases. Programmer will build features that allow users to execute simple tasks on a smartphone or computer, while others will develop underlying systems that control networks.

2.4 Project Planning Summary

2.4.1 Modules/Components

Table 2.4.1 Module and Components for project

Item/Service	Justification
CCTV	Needed for installation 1; we do not make this item
Configuration service	Find service company to configure the CCTV at the housing area
Installation service	Needed for transferring data to CCTV; we do not have the skill for installation.
Internet service	To do research
Google Clouds	For storage, big data, can be used for cloud AI.

2.4.2 Budget

FUSION TECH SDN BHD

CALCULATE NET PRESENT VALUE (NPV) FOR INVESTMENT

		2020	2021	2022	2023	2024	2025	2026
		Actuals	Plan	Plan	Plan	Plan	Plan	Plan
		Investment						
Cash Flows	**Total**	**($3,000,000)**	**$250,000**	**$395,000**	**$405,750**	**$450,500**	**$500,200**	**$6,635,605**
Discounted Rate (Risk)	10%							
NPV (Manual)	$ 2,786,167.77		$ 80,646.16	$ 127,421.35	$ 130,890.10	$ 145,326.58	$ 161,359.84	$ 2,140,523.74
NPV (Formula)	$5,222,473.43							
The higher the VPN, the better	$ 2,222,473.43							
Means the return from a project	79.77%				**ACCEPTED**			
exceeds the cost of capital								

Figure 2.4.2 Budget for project

3.0 Implementing the Project Plan

3.1 Tasks and Estimated Costs

a) Acquisition

			OVERALL	GRANT	MATCH			
			Budget must account for all costs to complete the project	*Enter only the amount of the grant request*	*The Grant Request and Match should equal the total project cost and Budget Check cell should be 0. Sponsors must account for all sources and types of match need to complete the project.*			
			Amount	Funding amount	Match in PRISM	Funding not reported in PRISM	Source (Grant, Cash, Materials, Labor, Volunteers, etc)	Match Type (federal, state, local)
Property Costs								
Item	Qty	Rate						
Laptop	3	$ 4,217.00	$ 12,651.00	$ 12,651	$ -	$ -		
		$ -	$ -	$ -	$ -	$ -		
		$ -	$ -	$ -	$ -	$ -		
		$ -	$ -	$ -	$ -	$ -		
		$ -	$ -	$ -	$ -	$ -		
		$ -	$ -	$ -	$ -	$ -		
		STotal	$ 12,651	$ 12,651	$ -	$ -		
Incidental Costs								
Item	Qty	Rate						
Food	350	$ 15.00	$ 5,250	$ 5,250	$ -	$ -		
Transportation	25	$ 150.00	$ 3,750	$ 3,750	$ -	$ -		
Travel	25	$ 300.00	$ 7,500	$ 7,500	$ -	$ -		
		$ -	$ -	$ -	$ -	$ -		
		$ -	$ -	$ -	$ -	$ -		
		$ -	$ -	$ -	$ -	$ -		
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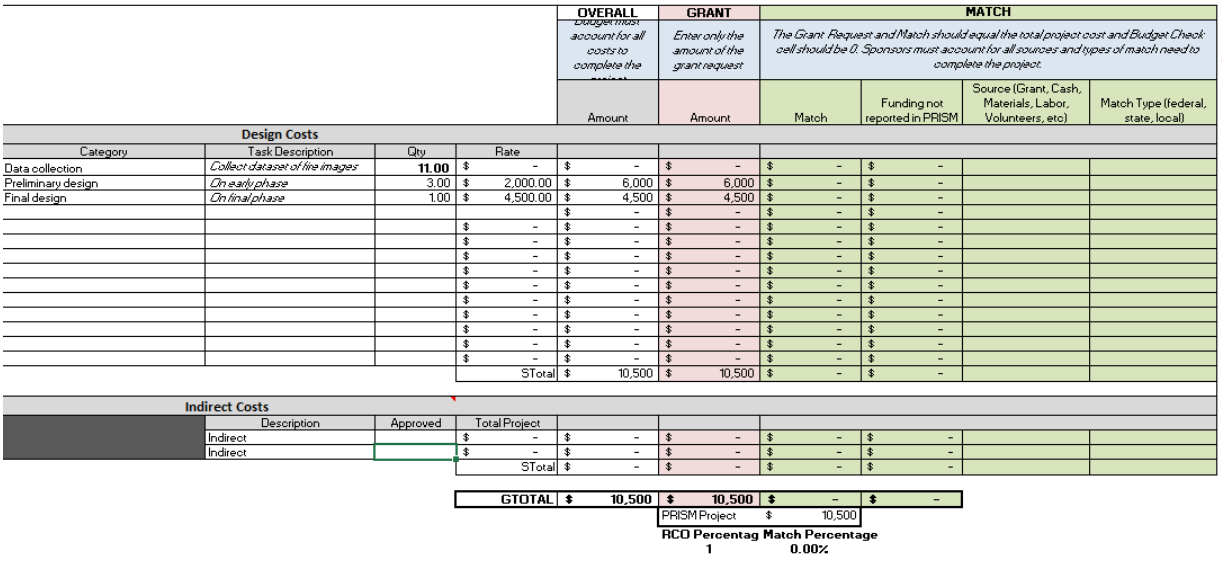
		$ -	$ -	$ -	$ -	$ -		
		STotal	$ 16,500	$ 16,500.00	$ -	$ -		
Administrative Costs								
Item	Qty	Rate						
Project Coordinator	9	$ 4,300.00	$ 38,700	$ 38,700	$ -	$ -		
Project Manager	9	$ 5,000.00	$ 45,000	$ 45,000	$ -	$ -		
		$ -	$ -	$ -	$ -	$ -		
		$ -	$ -	$ -	$ -	$ -		
		STotal	$ 83,700	$ 83,700	$ -	$ -		
Indirect Costs								
Description	Approved	Total Project						
Indirect Costs			$ -	$ -	$ -	$ -		
Indirect Costs		$ -	$ -	$ -	$ -	$ -		
		STotal	$ -	$ -	$ -	$ -		
			GTOTAL	$ 112,851	$ -	$ -		
				PRISM Project	$ 112,851			
				RCO Percentag	Match Percentage			
				$ 1	0			

Administrative Budget Check
A&E maximum allowed in PRISM *$1,457.55*
A&E validation *-$12,242.45*

Figure 3.1 (a) Budget for acquisition

b) Design Projects



				OVERALL	GRANT	MATCH			
				Budget must account for all costs to complete the project	Enter only the amount of the grant request	The Grant Request and Match should equal the total project cost and Budget Check cell should be 0. Sponsors must account for all sources and types of match need to complete the project.			
				Amount	Amount	Match	Funding not reported in PRISM	Source (Grant, Cash, Materials, Labor, Volunteers, etc)	Match Type (federal, state, local)
Design Costs									
Category	Task Description	Qty	Rate						
Data collection	*Collect dataset of fire images*	**11.00**	$ -	$ -	$ -	$ -	$ -		
Preliminary design	*On early phase*	3.00	$ 2,000.00	$ 6,000	$ 6,000	$ -	$ -		
Final design	*On final phase*	1.00	$ 4,500.00	$ 4,500	$ 4,500	$ -	$ -		
				$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
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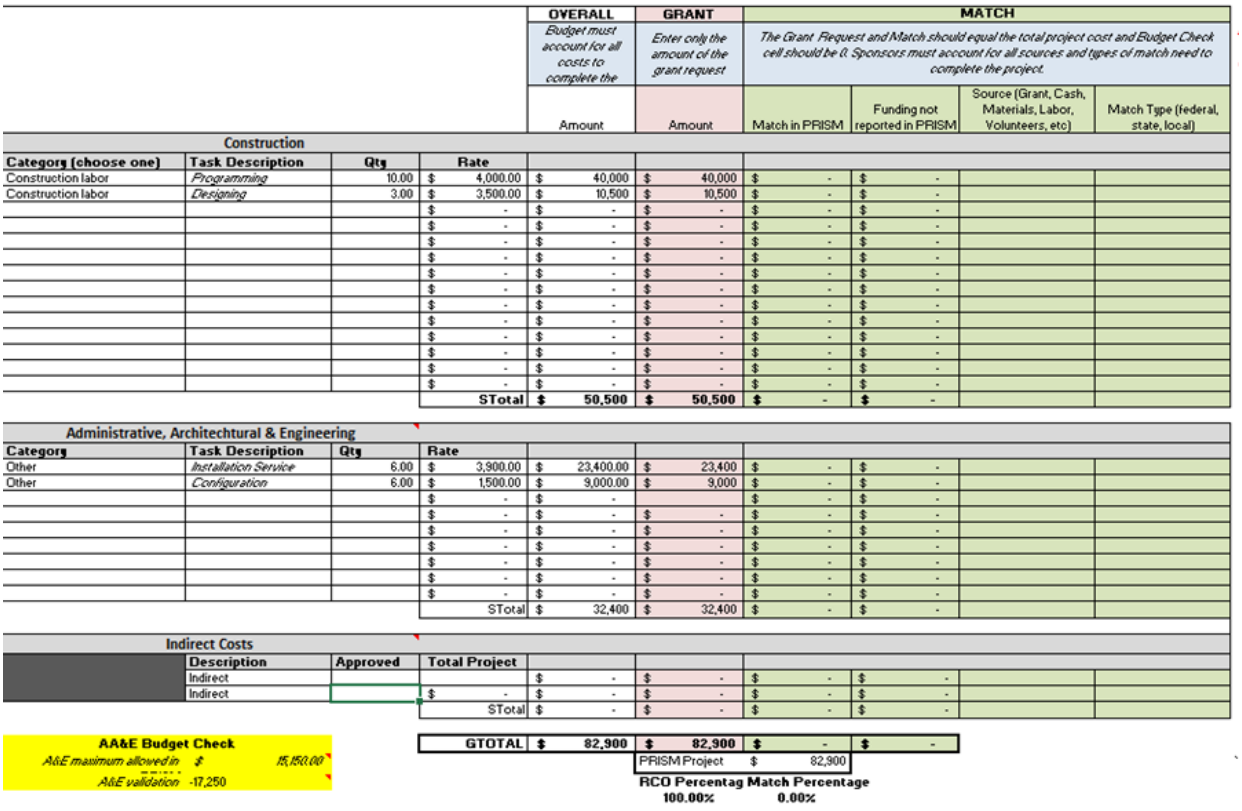
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			STotal	$ 10,500	$ 10,500	$ -	$ -		
Indirect Costs									
	Description	Approved	Total Project						
	Indirect		$ -	$ -	$ -	$ -	$ -		
	Indirect		$ -	$ -	$ -	$ -	$ -		
			STotal	$ -	$ -	$ -	$ -		
			GTOTAL	**$ 10,500**	**$ 10,500**	**$ -**	**$ -**		
					PRISM Project	$ 10,500			
					RCO Percentag	**Match Percentage**			
					1	**0.00%**			

Figure 3.1 (b) Budget for design projects

c) Restoration



				OVERALL	GRANT	MATCH			
				Budget must account for all costs to complete the project	Enter only the amount of the grant request	The Grant Request and Match should equal the total project cost and Budget Check cell should be 0. Sponsors must account for all sources and types of match need to complete the project.			
				Amount	Amount	Match in PRISM	Funding not reported in PRISM	Source (Grant, Cash, Materials, Labor, Volunteers, etc)	Match Type (federal, state, local)
Construction									
Category (choose one)	**Task Description**	**Qty**	**Rate**						
Construction labor	*Programming*	10.00	$ 4,000.00	$ 40,000	$ 40,000	$ -	$ -		
Construction labor	*Designing*	3.00	$ 3,500.00	$ 10,500	$ 10,500	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
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			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			STotal	**$ 50,500**	**$ 50,500**	**$ -**	**$ -**		
Administrative, Architechtural & Engineering									
Category	**Task Description**	**Qty**	**Rate**						
Other	*Installation Service*	6.00	$ 3,900.00	$ 23,400.00	$ 23,400	$ -	$ -		
Other	*Configuration*	6.00	$ 1,500.00	$ 9,000.00	$ 9,000	$ -	$ -		
			$ -	$ -		$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			STotal	$ 32,400	$ 32,400	$ -	$ -		
Indirect Costs									
	Description	**Approved**	**Total Project**						
	Indirect			$ -	$ -	$ -	$ -		
	Indirect		$ -	$ -	$ -	$ -	$ -		
			STotal	$ -	$ -	$ -	$ -		
AA&E Budget Check									
AA&E maximum allowed in	$	*15,150.00*							
AA&E validation	-17,250								
			GTOTAL	**$ 82,900**	**$ 82,900**	**$ -**	**$ -**		
					PRISM Project	$ 82,900			
					RCO Percentag	**Match Percentage**			
					100.00%	**0.00%**			

Figure 3.1 (c) Budget for restoration

d) Cumulative Totals

	OVERALL PROJECT Cost	GRANT REQUEST Amount	PRISM MATCH Amount	MATCH NOT IN PRISM Amount	Budget Check
Sheet #1 Acquisition					
Property Costs	$ 12,651	$ 12,651	$ -	$ -	0
Incidental Costs	$ 16,500	$ 16,500	$ -	$ -	0
Administrative Costs	$ 83,700	$ 83,700	$ -	$ -	0
Indirect Costs	$ -	$ -	$ -	$ -	
STotal	$ 112,851	$ 112,851	$ -	$ -	0
Sheet #2 Design					
Design Costs	$ 10,500	$ 10,500	$ -	$ -	
Indirect Costs	$ -	$ -	$ -	$ -	
STotal	$ 10,500	$ 10,500	$ -	$ -	0
Sheet #3 Restoration					
Construction Costs	$ 50,500	$ 50,500	$ -	$ -	0
AA&E	$ 32,400	$ 32,400	$ -	$ -	0
Indirect Costs	$ -	$ -	$ -	$ -	
STotal	$ 82,900	$ 82,900	$ -	$ -	0
GTOTAL	**$ 206,251**	**$ 206,251**	**$ -**	**$ -**	0

Total PRISM Project Budget	$ 206,251

Figure 3.1 (c) Cumulative total of budget

3.2 Milestone Chart

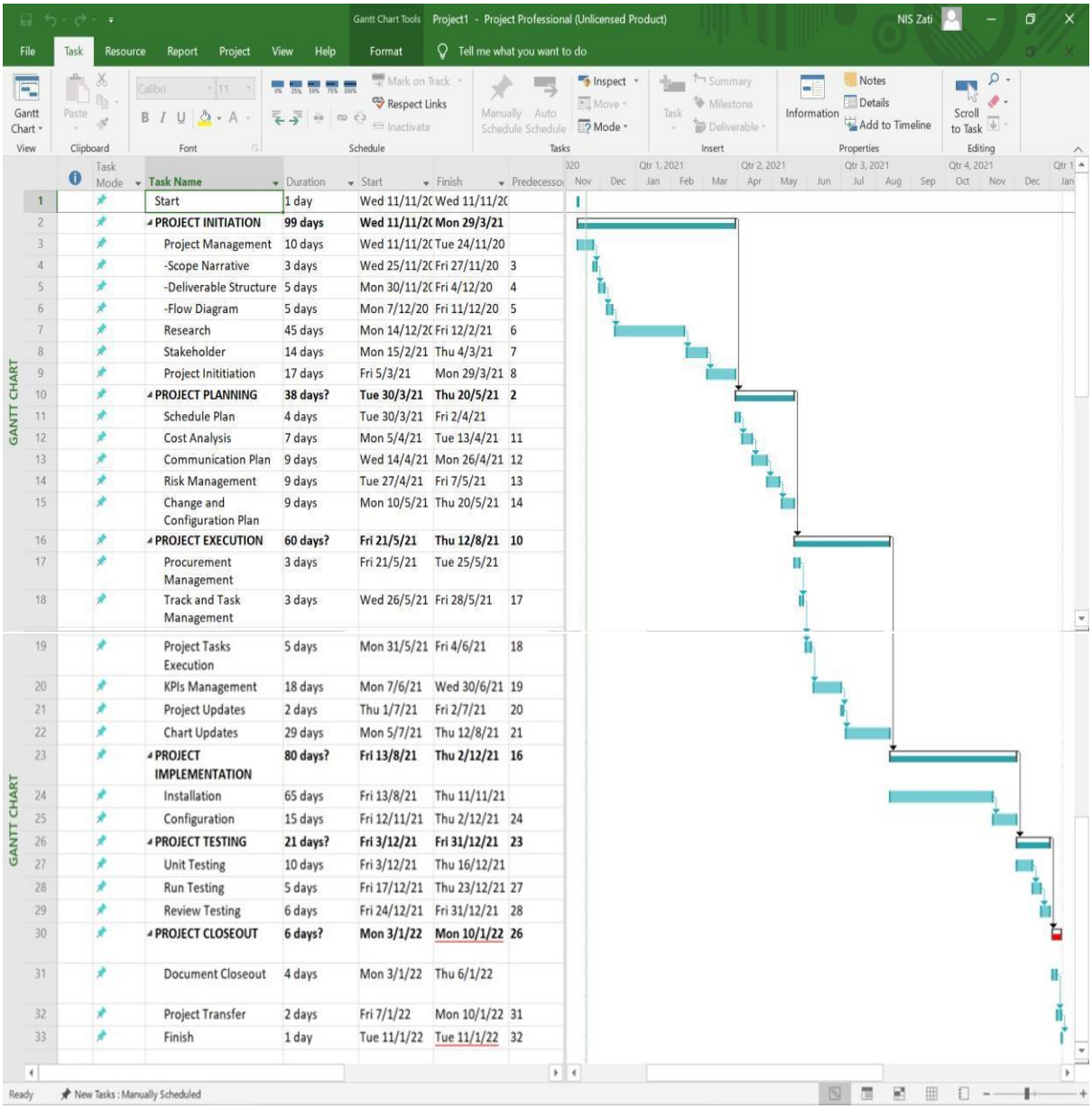


Figure 3.2 Project milestone

4.0 Executing the Project

4.1 Design/Diagrams

a) Flowchart

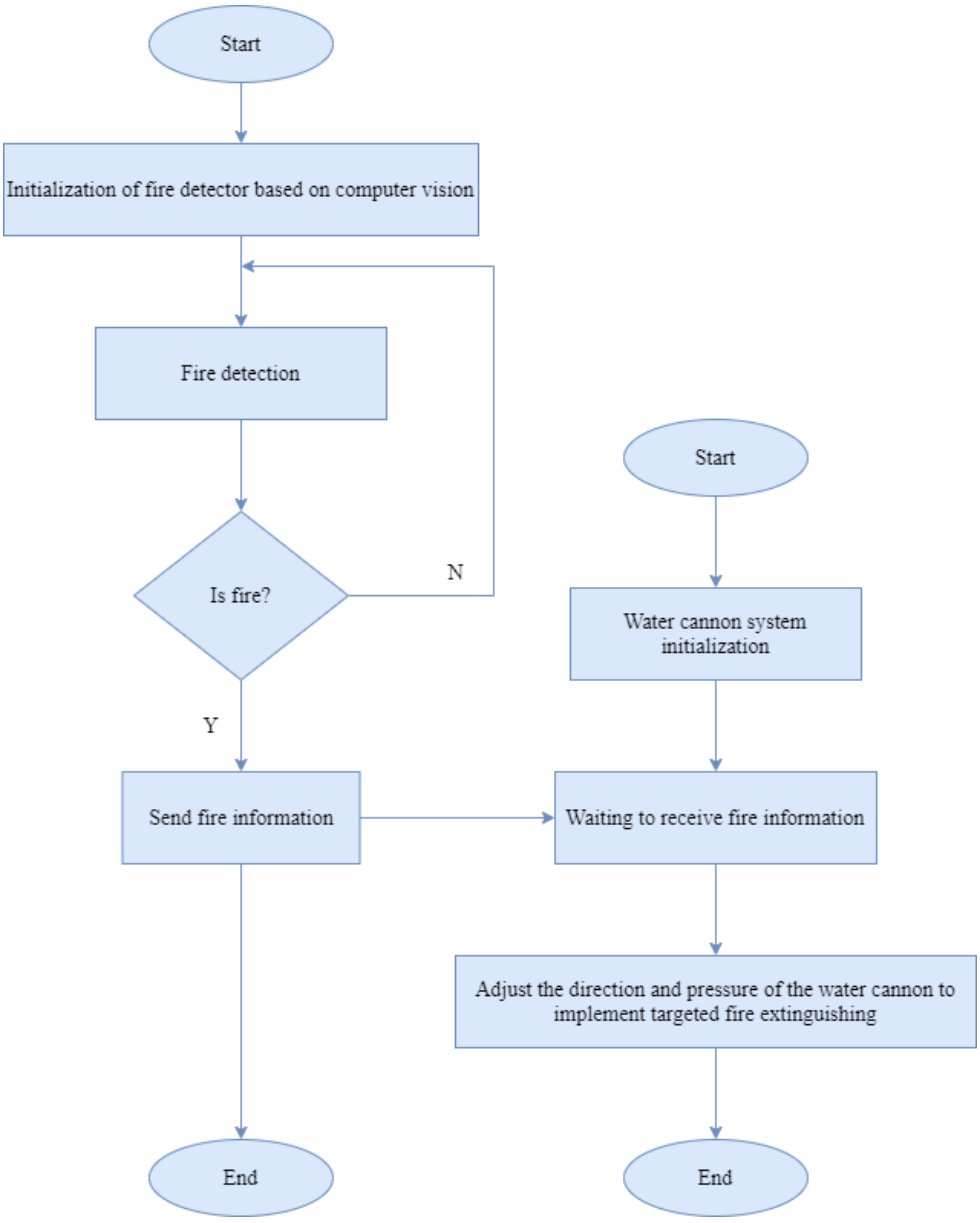


Figure 4.1 (a) Automatic Fire Detection System

b) Fire Detection Algorithm

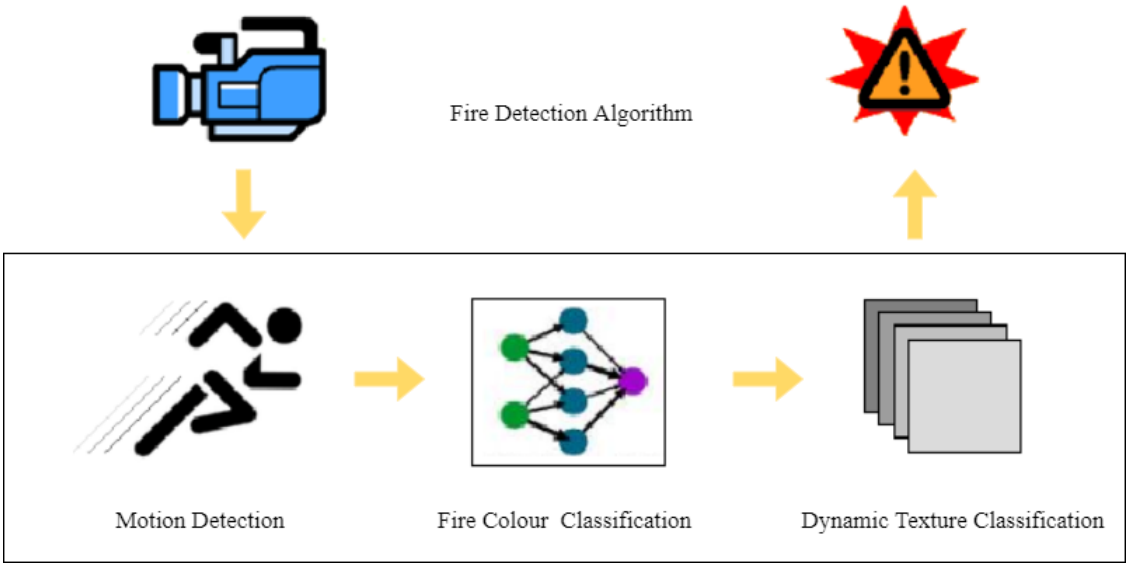


Figure 4.1 (b) The fire detection algorithm outline

4.2 Coding

a) Customized CNN Architecture

```
import tensorflow as tf
import keras_preprocessing
from keras_preprocessing import image
from keras_preprocessing.image import ImageDataGenerator
TRAINING_DIR = "Train"
training_datagen = ImageDataGenerator(rescale = 1./255,
                                      horizontal_flip=True,
                                      rotation_range=30,
                                      height_shift_range=0.2,
                                      fill_mode='nearest')
VALIDATION_DIR = "Validation"
validation_datagen = ImageDataGenerator(rescale = 1./255)
train_generator = training_datagen.flow_from_directory(TRAINING_DIR,
                                       target_size=(224,224),
                                       class_mode='categorical',
                                       batch_size = 64)
validation_generator = validation_datagen.flow_from_directory(
                                         VALIDATION_DIR,
                                         target_size=(224,224),
                                         class_mode='categorical',
                                         batch_size= 16)

from tensorflow.keras.optimizers import Adam
model = tf.keras.models.Sequential([
tf.keras.layers.Conv2D(96, (11,11), strides=(4,4), activation='relu', input_shape=(224, 224, 3)), tf.keras.layers.MaxPooling2D(pool_size = (3,3), strides=(2,2)),
tf.keras.layers.Conv2D(256, (5,5), activation='relu'),
tf.keras.layers.MaxPooling2D(pool_size = (3,3), strides=(2,2)),
tf.keras.layers.Conv2D(384, (5,5), activation='relu'),
tf.keras.layers.MaxPooling2D(pool_size = (3,3), strides=(2,2)),
tf.keras.layers.Flatten(),
tf.keras.layers.Dropout(0.2),
tf.keras.layers.Dense(2048, activation='relu'),
tf.keras.layers.Dropout(0.25),
tf.keras.layers.Dense(1024, activation='relu'),
tf.keras.layers.Dropout(0.2),
tf.keras.layers.Dense(2, activation='softmax')])
model.compile(loss='categorical_crossentropy',
```

```
optimizer=Adam(lr=0.0001),
metrics=['acc'])
history = model.fit(
train_generator,
steps_per_epoch = 15,
epochs = 50,
validation_data = validation_generator,
validation_steps = 15
)
```

b) Inception V3 Model

```
import tensorflow as tf
import keras_preprocessing
from keras_preprocessing import image
from keras_preprocessing.image import ImageDataGenerator
TRAINING_DIR = "Train"
training_datagen = ImageDataGenerator(rescale=1./255,
zoom_range=0.15,
horizontal_flip=True,
fill_mode='nearest')
VALIDATION_DIR = "/content/FIRE-SMOKE-DATASET/Test"
validation_datagen = ImageDataGenerator(rescale = 1./255)
train_generator = training_datagen.flow_from_directory(
TRAINING_DIR,
target_size=(224,224),
shuffle = True,
class_mode='categorical',
batch_size = 128)
validation_generator = validation_datagen.flow_from_directory(
VALIDATION_DIR,
target_size=(224,224),
class_mode='categorical',
shuffle = True,
batch_size= 14)

from tensorflow.keras.applications.inception_v3 import InceptionV3
from tensorflow.keras.preprocessing import image
from tensorflow.keras.models import Model
from tensorflow.keras.layers import Dense, GlobalAveragePooling2D, Input, Dropout
input_tensor = Input(shape=(224, 224, 3))
base_model = InceptionV3(input_tensor=input_tensor, weights='imagenet', include_top=False)
x = base_model.output
x = GlobalAveragePooling2D()(x)
x = Dense(2048, activation='relu')(x)
x = Dropout(0.25)(x)
x = Dense(1024, activation='relu')(x)
x = Dropout(0.2)(x)
predictions = Dense(2, activation='softmax')(x)
model = Model(inputs=base_model.input, outputs=predictions)
for layer in base_model.layers:
  layer.trainable = False
model.compile(optimizer='rmsprop', loss='categorical_crossentropy', metrics=['acc'])
history = model.fit(
train_generator,
steps_per_epoch = 14,
epochs = 20,
validation_data = validation_generator,
validation_steps = 14)

#To train the top 2 inception blocks, freeze the first 249 layers and unfreeze the rest.
for layer in model.layers[:249]:
  layer.trainable = False
for layer in model.layers[249:]:
  layer.trainable = True
#Recompile the model for these modifications to take effect
from tensorflow.keras.optimizers import SGD
model.compile(optimizer=SGD(lr=0.0001, momentum=0.9), loss='categorical_crossentropy', metrics=['acc'])
history = model.fit(
train_generator,
steps_per_epoch = 14,
epochs = 10,
validation_data = validation_generator,
validation_steps = 14)
```

c) Real Time Testing

```
import cv2
import numpy as np
from PIL import Image
import tensorflow as tf
from keras.preprocessing import image
#Load the saved model
model = tf.keras.models.load_model('InceptionV3.h5')
video = cv2.VideoCapture(0)
while True:
        _, frame = video.read()
#Convert the captured frame into RGB
        im = Image.fromarray(frame, 'RGB')
#Resizing into 224x224 because we trained the model with this image size.
        im = im.resize((224,224))
        img_array = image.img_to_array(im)
        img_array = np.expand_dims(img_array, axis=0) / 255
        probabilities = model.predict(img_array)[0]
        #Calling the predict method on model to predict 'fire' on the image
        prediction = np.argmax(probabilities)
        #if prediction is 0, which means there is fire in the frame.
        if prediction == 0:
                frame = cv2.cvtColor(frame, cv2.COLOR_RGB2GRAY)
                print(probabilities[prediction])
cv2.imshow("Capturing", frame)
        key=cv2.waitKey(1)
        if key == ord('q'):
                break
video.release()
cv2.destroyAllWindows()
```

4.3 Output

a) Motion Detection

Figure 4.3 (a) Original frame sequence

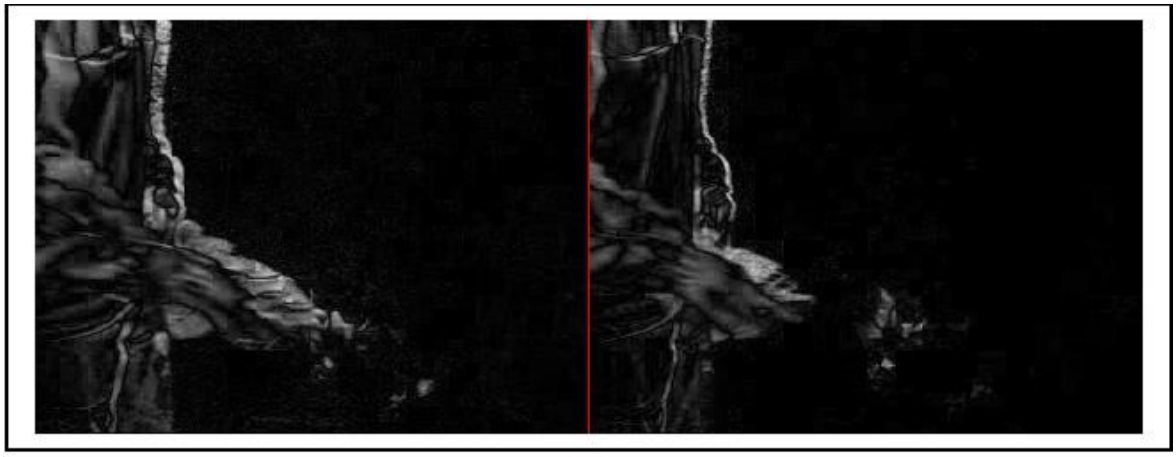


Figure 4.3 (a) Motion detected frame differencing

b) Detecting Fire-Coloured Pixels

Figure 4.3 (b) Original image

Figure 4.3 (b) Red denotes pixels that were classified as being colour

c) Motion and Colour

Figure 4.3 (c) Fire-colour classification sans motion detection

Figure 4.3 (c) Fire-colour classification plus motion detection

5.0 Completing the Project

5.1 Acceptance/Project Completion Form Sign-Off

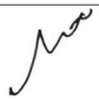
Customer Acceptance/Project Completion Form

7 January, 2021

Project Name : Fire Detection using Computer Vision

Project Manager : Nur'Ain Najiha binti Zakaria

I (We), the undersigned, acknowledge and accept delivery of the work completed for thisproject on behalf of our organization. My (Our) signature(s) attest to my (our) agreementthat this project has been completed. No further work should be done on this project.

Name	Title	Signature	Date
Megala d/o Sontulom	System Designer		7 January 2021
Nur Izzati Binti Shafie	Programmer		7 January 2021

1. Was this project completed to your satisfaction? Yes / No

2. Please provide the main reason for satisfaction or dissatisfaction with this project.

The main satisfaction for completing this project are the quality management plan deliverable are exceptionally strong. In addition, updated the project plan based on the feedback received from the team leader and develop the training plan for this project to interesting.

3. Please provide suggestions on how our organization could improve its project delivery capability in the future.

For my suggestions, to improve the project delivery capability in the future is communicate more effectively, be more efficient with your work and get fast movements in your works. And also, focuses on the integration of the projects within the organisation and the intention is to have better integration and strategic alignment.

Thank you for your input.

5.2 Lessons Learned Document

Lesson-Learned Report

January 7, 2021

Project Name : Fire Detection using Computer Vision
Project Sponsor : Muhammad Ariff Azhan bin Zakaria
Project Manager : Nur'Ain Najiha binti Zakaria
Project Dates : November 11, 2020 – 29 March, 2021
Final Budget : RM206,251

1. **Did the project meet scope, time and cost goals?**

   We did meet scope and time goals but we had to request an additional RM15,000, which the sponsor approved. We actually exceeded scope goals by having more people take training courses than planned, primarily the Web-based courses.

2. **What was the success criteria listed in the project in the scope statement?**

   The following statement outlined the project scope and success criteria:
   "Our sponsor has stated that the project will be a success if the new training courses are all available within one year, if the average course evaluations are at least 3.0 on a 1-5 scale and if the company recoups the cost of the project in reduced training costs within two years after project completion."

3. **Reflect on whether or not you met the project success criteria.**

   All of the new training courses were offered within a year and the course evaluations averaged 3.4 on a 5.0 scale. We do not know if the cost of the project will be recouped within two years after expectations. Because the Web-based training is more cost-effective than the instructor-led-training, we are confident that the costs will be recouped in less than two years.

4. **What were the main lessons your team learned from this project?**

   The main lessons we learned include the following:

   - Having a good communication was instrumental to project success. We had a separate item in the WBS for stakeholder communications, which was very important. Moving from traditional to primarily Web-based training was a big change for Fusion Tech, so the strong communication was crucial. The intranet-site information was excellent, thanks to support from the IT departments create the project description posters to hang in their work areas. They showed creativity and team spirit.

6.0 Project Presentation

YouTube Link: https://youtu.be/Ws1ZOpu5PCA