**OBJECTIVE**

The principal objective of this study is

**Automatic Bangla Digital Number Plate Detection & Recognition System using Image Processing & Deep Learning**

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**EXPERIMENTAL RESULT IMPLEMENTATION OF WEBSITE**

**Table 1**: Experimental Results of Number Plate Detection

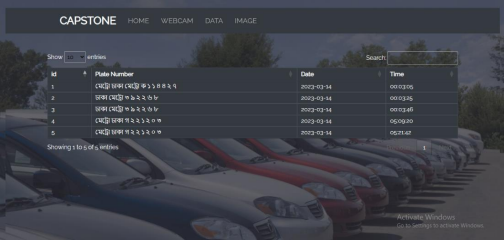
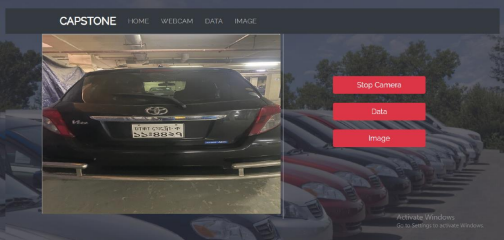
• to propose a system that can detect and extract a number plate from an image,

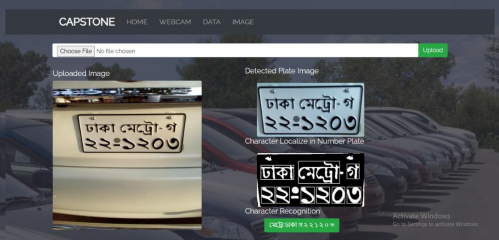
• localize characters, segment them from a number plate, and • Finally, recognize those characters to collect the license plate’s number.

**METHODOLOGY**

| **Model Name** | **Accuracy** | **Precision** | **Recall** | **mAP@.5** | **mAP@0.5:0.95:** |
| --- | --- | --- | --- | --- | --- |
| YOLO V7 | 0.91 | 0.994 | 0.901 | 0.938 | 0.827 |
| Image Processing Techniques | – | 0.936 | 0.915 | – | – |

**Table 2:** Experimental Results of Character Localization **Table 3**: Experimental Results of Character Localization

**Used Technologies :**

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| **Method** | **Accuracy (%)** |
| --- | --- |
| YOLO V7 | 91.38% |
| Others(using same  dataset) | 89.10% |

| **Precision** | **Recall** |
| --- | --- |
| 0.85 | 0.97 |



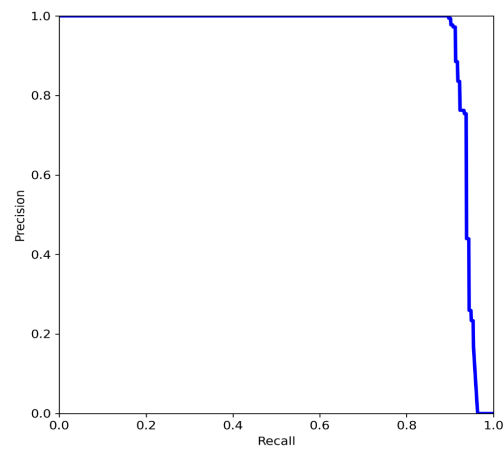
**Figure 01:** Workflow Diagram

**Supervised By**

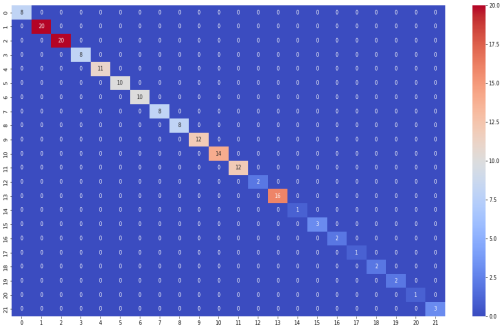
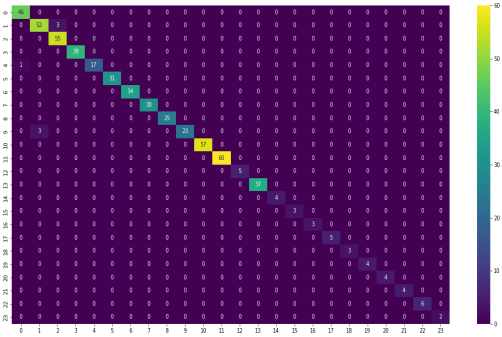
**Table 4:** Experimental Results of Character Localization

| **Model Name** | **Loss** | **Accuracy** | **Precision** | **Recall** |
| --- | --- | --- | --- | --- |
| Inception | 0.3522 | 0.8696 | 0.8807 | 0.8587 |
| VGG16 | 0.5226 | 0.9157 | 0.9187 | 0.8413 |
| VGG19 | 0.5379 | **0.9369** | 0.9127 | **0.9476** |
| Xception | 0.3726 | 0.9026 | **0.9539** | 0.8261 |
| DenseNet | **0.3254** | 0.8985 | 0.8994 | 0.8565 |
| Inception | 0.3574 | 0.8312 | 0.8801 | 0.8220 |

**Figure 04:** Confusion Matrix of YOLO V7 model **Figure 05:** Precision recall curve of YOLO

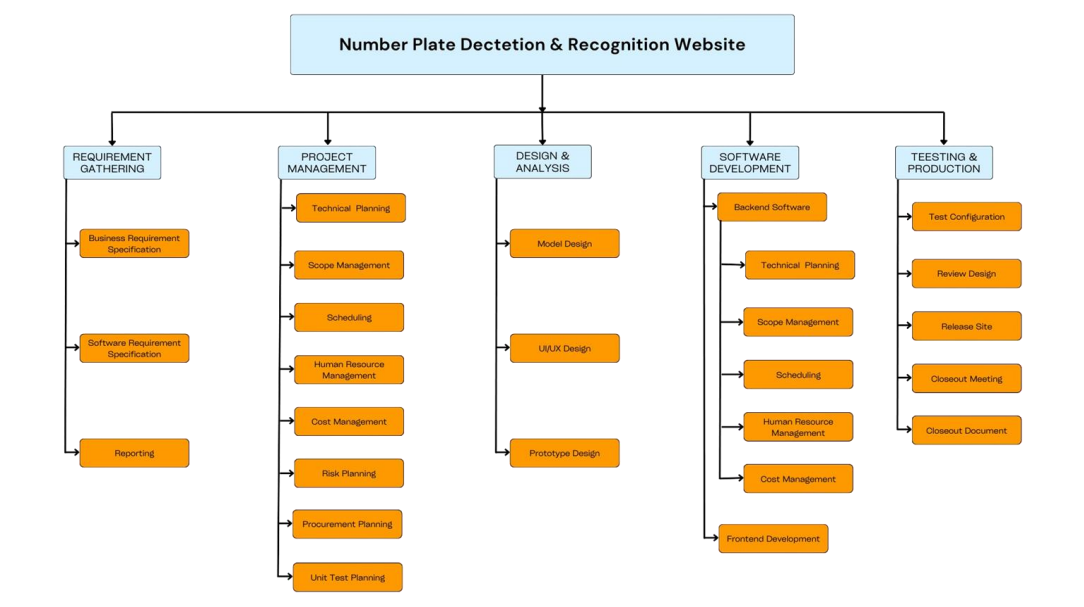


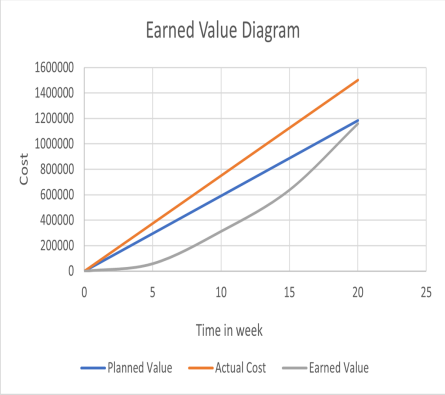
V7

**Figure 06:** Confusion Matrix of VGG19 in train & test phase

**References**

**EARN VALUE MANAGEMENT**

**Figure 07:** Work Breakdown Structure (WBS)

**COST CALCULATION & EARNED VALUE DIAGRAM **

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