Earned Value Management system Project

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Author Note

Earned Value Management Project

A machine learning based project by the name of Vehicle Detection and Recognition System, to be developed by the research and development department of Teradata. This document will provide a detailed analysis of the work breakdown structure for the completion of the project and a detailed timeline for the different steps involved as well. The way that the document will be structured is that, in the beginning, the scope of the project and the expected requirements will be discussed. This will be followed by the work breakdown structure for the project and the organizational business structure that will be leveraged for the extraction of the required resources and the approach that will be taken for the completion of this project. This project will be completed with the time phased control account plans for the resources involved.

# Scope of the Project

Vehicle Detection and Recognition system is a project that, as the name suggests, deploys machine learning algorithms to solve the problem of automated Vehicle Detection and Recognition.

* The project leverages the power of convolutional neural networks along with the already built object detection algorithms to provide the user with a completely developed backend.
* An advanced user experience will be developed while recognizing and storing the names of the car based upon the make and type in a MySQL database that gets updated regularly.
* Agile development framework will be employed for the design and development of the algorithm so that a continuous feedback loop is maintained and the software is constantly improved.
* The final deliverables will include a completely developed software and complete documentation for the software as well as a user manual for the developed graphical user interface.
* Data analysis functionality will be provided so that the data stored could be analyzed and insights could be extracted for future work.

# Work Breakdown Structure

The important sets of resources that are required for the completion of the project, such as human resource will be leveraged from the already existing and fully functional research and development department while monetary resources will be gained from the higher management by presenting a detailed project report for the market value and the feasibility of the project.

# Responsibility Assignment Matrix

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Activities** | **Personnel** | | **Software Engineer** | | **DevOps Engineer (Team lead)** | | **Technical Support** | | **Writing Specialist** |
| **Coordination of activities** | |  | | N, A | | R | |  | |
| **Literature review** | | R | | N | | N | | R | |
| **Development environment setup** | | R | | S, A | | N | |  | |
| **Algorithm infrastructure design** | | R | | S, A | | N | |  | |
| **Software documentation** | | S | | A | | S | | R | |
| **User manual development** | | S | | A | | N | | R | |
|  | |  | |  | |  | |  | |

R = Responsible.

N = To be notified.

A = Approval Required.

S = Support provision.

# Control Account Plan

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **July** | **Aug** | **Sept** | **Oct** | **Nov** | **Dec** |
| **Coordination of activities** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Literature Review** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Development environment setup** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Algorithm infrastructure design** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Software Implementation** |  |  |  |  |  |  |  |  |  |  |  |  |
| **User manual development** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Monthly budget (K $)** | 10 | 10 | 20 | 15 | 12 | 12 | 12 | 30 | 25 | 25 | 10 | 10 |
| **Cumulative budget** | 10 | 20 | 40 | 55 | 67 | 79 | 91 | 121 | 146 | 171 | 181 | 191 |

The proposed budget is approximately 200k $. The extra 9k $ is there to account for the variance of budget in terms of tasks. The bar graph visualizing the data that has been already represented in the control account plan.

Earned value is the last step of earned value management. Earned value is described as a work that is completed to date. Earned value is an approach that helps to monitor the actual work, project plan and completed work value to check whether the project is on a track. Earned value shows how much time and budget have been spent by taking into consideration the amount of work done so far. It is considered as the most useful tool because it shows how much value has been earned from the money that was spent on the project to date. Earned value (EV) is used to calculate the cost variance, cost performance index, schedule variance, and complete performance index.

**Formula**

The formula to calculate the value of Earned Value is following

Earned Value = % of completed work X BAC (Budget at Completion).

**Calculation**

This project has to be completed in 12 months. The total budget for this project is 200,000 USD. Three months have passed, and 120,0000 USD has been spent on the project. Uptill now software implementation which is 40% of the work has been completed. The project earned value is the value of a project that has been earned and is calculated as follows

Earned value= 30% of the total work value

= 40% of BAC

= 40% of 200,000

=0.4\*200,000

=80,0000 USD

The project's Earned Value is 80,000 USD.

Scheduled Variance

Actual Cost (AC)= 120,000USD

Planned Value (PV)=50% of 200,000

=100,000USD

As half of the time has been passed therefore planned value is taken as 50% by assuming that budget is evenly distributed.

Earned Value= 40% of the 200,000

= 80,000 USD

Now,

 Schedule Variance = Earned Value – Planned Value

 = 80,000 – 100000

= -20,000 USD

The schedule Variance of the project is -20,000 USD. This shows that the project is behind schedule since the value is negative.

**Variance Analysis Report**

The variance Analysis report is important to determine the gap between the actual outcome and the planned outcome. In other words, the gap between the actual and budget is known as Variance.

**Report**

To: Board of Directors

From: Project Manager

Date: December 18, 2019

Subject: Actual and Budget Variance Report

|  |  |  |  |
| --- | --- | --- | --- |
| Particular | Budget ( 1 Aug to 30Nov) | Actual (( 1 Aug to 30Nov) | Variance ($) |
| Software implementation | 80,000 | 120,000 | -40,000 |

  Hence, The Cost Variance of the project is –40,000 USD. this shows over budget. As variance is negative, therefore corrective actions are needed to bring the project back on track. The reason behind this negative variance can be a change in the market conditions such as a shortage of different software. another reason for this variance is the shortage of skilled software professionals in the market. In this case, the negative variance can also be due to the reason that planning was not done properly at the start. This variance report of one control account will help the management team to make an effective future decision.