Deep Learning Challenge Analysis:

In this challenge, we need to find out a tool that can help select the applications that has the highest chance of success. We will examinate the data by using neural network model.

Data Preprocessing:
The data contains the application type, classification, amount requested, EIN, name and the successfulness. In this case, our target data will be "IS_SUCCESSFUL" column. The features variables are application type, and classification. There are some columns can be removed because they do not have direct relationship to "IS_SUCCESSFUL" column, which includes EIN, Name, Ask_AMT.

Compiling, Training and Evaluating the Model:
I selected the neuron units as 10 for layer 1, 6 for layer 2 and 1 for outer for the first round. The activation function is "relu" for the first 2 layer and "Sigmoid" for the outer layer. It has a 73.08% accuracy result. In the second round, I changed the neuron units to 15 for layer 1, 8 for layer 2, 4 for layer and 1 for the outer layer to see if increasing the neurons will boost the accuracy. I also updated the activation function to "Sigmoid" for all of the layers. I also increase the epochs from 120 to 160 to increase the accuracy. The accuracy increase from 73.08% to 73.13%. In the third round, I only used 2 layers and 1 outer layers. The first two layer activation function is "tanh" while the outer layer is "sigmoid". The neuron unites are the same as round 1. In this round, the accuracy increased to 73.25%. I was able to get the accuracy increases but it does not reach 75%. Changing the activation function and increasing the neuro units can help increasing the accuracy.

Method 1 accuracy and loss:

```
268/268 - 0s - loss: 0.5538 - accuracy: 0.7299 - 142ms/epoch - 530us/step
Loss: 0.5537809133529663, Accuracy: 0.729912519454956
```

Method 2 accuracy and loss:

```
268/268 - 0s - loss: 0.5499 - accuracy: 0.7313 - 136ms/epoch - 507us/step
Loss: 0.5498935580253601, Accuracy: 0.7313119769096375
```

Method 3 accuracy and loss:

```
268/268 - 0s - loss: 0.5534 - accuracy: 0.7325 - 173ms/epoch - 645us/step
Loss: 0.5534375309944153, Accuracy: 0.732478141784668
```

Summary:
I will not recommend neural network model because the accuracy does not reach to 75%. The type of data that we are exanimating is categorial data because we are separating as successful and non-successful. Most neural networks are more suitable for identifying the pattern and the trends in the data. I would recommend random forest model in this case because that model composed of different decision trees. In our cases, the random forest model can help us sort our data through the decision trees algorithm and help us to find successful applications.