Executive summary

Machine vision (MV) is a field of computer science that focuses on providing imaging-based automatic inspection and analysis for various industrial applications, including process control, robot guiding, and automatic inspection. It has been widely used in medicine, manufacturing, and military fieldsfieldsd military. The logistics industry has now started tapping into the potential of machine vision and major players like DHL, DSV, and American Postal Services have implemented machine vision to improve their operations. But this is just the start of the mass adoption of machine vision in the logistics sector, and studies show that the market is growing at a CAGR of 5% in the US itself.

The main objective of this project is to find use cases and solutions which involve machine vision technology in the logistics and distribution sector. And analyze the cost and recovery time for each of them to discover the most promising investment one.

Our approach includes market analysis on potential customers, solution specification including infrastructure and software features, and cost analysis for Deloitte and customers with the minimum engagement contribution of 40% given by Deloitte. Then we conduct thorough research and calculations on the recovery time for each use case.

We summarized the four most achievable and profitable use cases, which are warehouse space optimization, shipping package reduction, pest infestation detection and shipping container use condition detection and service life prediction. Among which, the warehouse space optimization should be the first to implement as it has the lowest recovery time, the calculations will be shown later in the report.

The use cases summary is as follows:

- Warehouse Space Optimization: A more space-efficient solution using machine vision to increase the revenue. This feature has the lowest break-even time and hence it is recommended that Deloitte start with developing this asset first.

- Shipping Package Reduction: This usecase is a noble usecase that supports the move towards a more sustainable future, along with giving the businesses a reduction of packaging waste and thereby reducing the operational costs. Due to the huge number of features required, and high complexity, this usecase has the highest break-even time, and hence it is suggested that this one be giving the last priority.

- Pest Infestation Detection: This an important asset that leverages Machine Vision to reduce the food wastage in cold-storage warehouses. The usecase identifies & eliminates the incoming pest-infested food, thereby reducing the potential food wastage losses.

- Shipping Container Use Condition Detection and Service Life Prediction: This usecase leveraged the classification aspect of machine vision to generate accurate grades for shipping containers and provide the expected service life. The usecase is aimed at improving the service life by 10-15% leading to an increase in the revenue for the shipping container vendor.

Overall, the investment from Deloitte could be recovered within 3 years and Deloitte can become the innovative leader of machine vision applications in the logistics sector.