**PROJECT PROPOSAL**

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| **Date of proposal: 4th February 2023** |
| **Project Title: ReXtract(Key-Value pair Information Extraction System for Intelligent Processing)** |
| **Group ID (As Enrolled in Canvas Class Groups): Team PREV**  **Group Members (name , Student ID):**  ***Pradeep Janakiraman - A0140188H***  ***Roy, Chiu Man Shan - A0249252A***  ***Ethan, Kuch Swee Cheng - A0249264X***  ***Vikram Sankireddypally - A0249306A*** |
| **Sponsor/Client:** *(Company Name, Address and Contact Name, Email, if any)* |
| **Background/Aims/Objectives:**  *In a manufacturing and logistic environment different OEM has various way of labelling their product labels. Human operators must visually reference to a hardcopy of Bill-Of-Material (BOM) or picklist during material kitting to ensure that the parts are prepared for assembly process. A 300-component list would take 4 hours for a human operator to visually tally and on-board the data into the SAP/Manufacturing Execution System (MES).*  *The aim of this project is to create an intelligent system that incorporates computer vision to extract key-value pair from packaging labels and a RPA-bot to automate the process of verification of a softcopy of BOM that a user could upload with ease using their mobile phone. This information can then be used to track the production process and ensure that the right product is being manufactured. Additionally, the system can be used to verify that the product information on the label is correct and up to date.*  Objectives:   1. *Develop a computer vision system that can extract key-pair value information from images and videos. The system will be designed to work with images and videos of products, product labels, and shipping labels, and it will be able to accurately identify and extract key information such as product name, manufacturer, weight, size, and serial number.* 2. *Develop aRPA-bot that uses the extracted key information and do a field verification with a softcopy BOM uploaded by the user.* |

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| **Project Descriptions:**  The project can be broken down into the following components:   1. Image/Video input: The system will accept image and video of product labels and shipping labels as input capture via digital camera or mobile phone. 2. Image Pre-processing: To improve the accuracy required for information extraction, this may include cropping, resizing and image augmentation to make the system robust during varying image acquisition conditions. 3. Object Detection: The system would use object detection algorithm to locate the relevant information on the image creating a boundary box for detecting where the key-value pair information lies on the image. 4. Text Recognition: Once the relevant information has been identified, the system will use Optical Character Recognition (OCR) algorithm to extract the text from the selected area on the image. The extracted text and its metadata(image coordinates) would be processed and stored. 5. Data Verification and Validation: The extracted text will undergo a field verification against a softcopy of Bill of Material(BOM) or picklist and flag if the component/product label is part of the assembly list. 6. Database: The extracted information can also be stored in a database which can be accessed by other system such as SAP or MES for ease of onboarding new components/product as part of data entry efforts. This database will serve as a centralized repository for all key-value pai information, making it easier to manage and analyze the data.   **Sample Image from different component OEM** |