SFWRENG 4G06 & MECHTRON 4TB6
Capstone Project – eBin
Group 20

Overall Process Workflow

Step	Topic	Inputs	Outputs	Acceptance criteria for outputs	Tools	Group performs**
1	Refine system requirement	Overall capstone proposition	Thoroughly documented system requirement	Cover all details whilst being readable as well as not too hard to implement	Overleaf Online LaTex Editor and Microsoft Office Word	Both
2	Design system composition	System requirement	Detailed design of each part	The design should meet or exceed all the requirements		Both
3	Development of machine learning tool	Pictures of all types of garbage	Determination of the type of garbage (recyclable or others)	80% accuracy of image recognition	Python TensorFlow	Software Team
4	Software control of the actuator (including drivers)	Image recognition software	Actuator rotation controlled by digital signal	Control module can control the actuator as required	Raspberry pi	Software Team
5	Integration of actuator and camera	Raspberry pi, camera and electrical components	A well-functioning embedded system	Accurate functioning of the actuator	Verilog and VHDL	Mechatronics Team
6	Design of sub-bins as well as other mechanical parts	Dimensions of all electrical and mechanical parts	Electrical and mechanical parts for the system	A justifiable design of hardware components that has no redundant or missing parts	AutoCAD or SolidWorks	Mechatronics Team
7	Assembly of parts (soldering, wiring, etc.)	Both software and hardware components	A complete and well-functioning prototype	Entire system is functioning correctly	Soldering tools	Both
8	Hazard analysis	Test cases of the system	Hazard analysis	A complete hazard analysis report of the system	Overleaf Online LaTex Editor	Both
9	V&V	All code used in software and hardware components	System requirements and specifications	All system requirements and specifications have been achieved and fulfilled their intended purposes.	Micro Focus Application Lifecycle Management	Both

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Standards to follow

FAA-DoT-Requirements-AR-08-32 for system requirements

ISO 22000 FSMS 2011 is for hazard analysis

IEEE Std 1012 – 2004 for V&V

Version control

The version control tool for this project will be Github.

Bug tracking

o How are you going to deal with changes to development artifacts?
Incorporate the use of change requests (CRs) in an ALM tool (most likely Micro Focus ALM) to both document all changes to deliverables as well as track defects.

o What bug tracking/change request tool?
Micro Focus Application Lifecycle Management

o How do you document change requests/bugs?
All defects and CRs will be documented in the ALM tool.

o How do you classify changes?
Software changes, electrical component changes, mechanical part changes, etc.

o How do you disposition them (decide what to do, verify that they have been completed, etc)
First, all change requests and defects will be assigned a severity factor from 1 to 5 (1 = showstopper, 5 = non-critical) based on how much the CR/ defect will affect our project. We will resolve defects based on this factor – CRs and defects with higher severity factors will be investigated first. Software changes and defects will mostly be code based, while electrical and mechanical changes will be hardware based. We will troubleshoot each change/ defect accordingly (changing code for software-related ones, re-configuring hardware components for hardware issues). Once the appropriate changes are done for a specific CR/ defect, we will verify these changes through functional testing as well as performance testing to see if any new problems have arisen due to the fix.