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| ID | Potential Risk | Description | Mitigation |
| 1 | Financial issue. | Due to the requirement of the project, it is expected that our team needs to purchase components such as sensors or cameras to evaluate the performance of the robot (cycle time). If the budget (10 million VND - provided by the school) is not used wisely and our team overspend to buy equipment, meaning that our team may not have enough money to buy components for other testing procedures. | Every purchase of equipment related to the project needs to be carefully researched about its function and capability. The equipment must be suitable for the given budget and is a requirement of the project. Moreover, every purchase must be recorded in the list to keep track of the spending of the team. Finally, our team will consult with the industry and academic supervisors for their opinion when we buy the new equipment. |
| 3 | Delay of the project timeline. | The timeline of the project may be affected due to many reasons such as members being sick and cannot finish their tasks on time. Besides, the low performance of the team in some specific tasks also affects the progress of the project. Moreover, factors such as holidays, other member studies, and the delay in receiving necessary equipment also contribute to the delay of the project if they are not calculated in the timeline. Additionally, if the initial objectives are not fully acknowledged by all team members, which leads to misunderstanding regarding the expected result and delays in the project. Finally, the change in the expected outcome of the project can also negatively affect the timeline of the project. | Weekly and bi-weekly meetings need to be conducted with the management team to ensure the project is still following the expected timeline. Additionally, the team needs to have a clear communication guidelines so that when there is an issue happens, the team can let the project management team know and have the appropriate plan to make sure the project can finish on time. Project outcomes and deliverables need to be clearly defined at the beginning of the project to avoid confusion. Schedule checking needs to be conducted to confirm the project is still the same as the vision of the original project. Finally, the use of a Gantt chart helps to clarify each member's task and keep track of the project's progress. |
| 4 | Robot’s performance is affected by inappropriate optimization methods. | This risk may occur when our team first installed the algorithm on the real robot. Its dues to the error in the assumption of parameters, calculation errors, and the use of simulation (robots in the ideal environment). This can make the robot operate poorly and not achieve the outcome of the project. In addition, mechanical parts of the robot can be broken due to the setup of parameters in the program (unrealistic velocity, cycle time, or bad configuration of joint angles) and the robot can be damaged because it is hit by other objects in its path. | The project team needs to thoroughly examine and do extensive research about the selected algorithm to ensure that it is suitable for the requirement of the project. Also, the algorithm must be suitable for the robot, all the assumptions and calculations need to account for factors such as vibration, inertia, the robot’s configurations, and conditions of the robot. Moreover, simulation results need to consider carefully since many values do not illustrate in the simulation. |
| 5 | Robot malfunction due to software errors (backend). | Our team is required to develop an algorithm to optimize the robot’s performance and motion for the Pick and Place task, which requires the use of Rapid code to interact with the robot in the real station. However, errors in the Rapid code (which is utilized for backend development) or software errors of the controller can affect the performance of the HMI application (installed on the controller). Basically, if there are errors on the backend side, those issues that affect the HMI application (cannot display the information generated by the robot to the station) will negatively affect the robot’s performance. | Our team needs to study and has a deep understanding of the operation of the software and how to use/update the RAPID code on the real station (controller) without affecting the robot by completing the RobotStudio training modules. In addition, if there is any error happens, our team needs to discuss it with the management team to find a suitable solution. Finally, our team needs to have good communication with the HMI team so that the error will not affect their team's project. |
| 6 | Communication issues. | In this project, our team needs to collab with 2 other teams (Adios and HHNV) to develop an HMI application for the ABB robot. It means that any miscommunication or misunderstanding can lead to the delay of the project and negatively impact the performance of the robot station in the project. Moreover, if the communication within our team is not good, it will affect the performance of our team and possibly delay our project timeline. | All the mentioned teams should have a group chat with the management team to ensure that everything is being tracked and informed to every member of the project. Weekly meetings and reports are recommended to establish clear and detailed insights about the current progress of the project. If there are issues that can affect the working process, our team will communicate with the industry and academic supervisors for further instruction. |