

## Exercise 2 - Suggestions for Software Project

The implementations that have already been developed have been pushed to our public repo: <https://github.com/buehler/mcs-event-driven-systems/>.

For our semester project for this course the group has decided to implement a workflow that uses the two robotic arms in the lab that are positioned on either end of a conveyor belt. The hardware that is present in the lab that can be integrated in this workflow further include a colour sensor, accelerometer, push buttons, proximity sensory and an NFC sensor (and possibly more). The workpieces that are present are different colours cubes, some of which are outfitted with an NFC tag. Further some user tasks will be incorporated where the user will start the flow of the process.

The rough flow of overall process will look something like:

1. Shipment manifest is created by user, detailing how many blocks are “delivered”, these blocks are placed by the user in the divided intake grid, a 9x9 grid
2. The robot arm will start a validation process by seeing if the shipment manifest is the same as the actual delivery of the blocks in the grid
3. There will be some further processing of the block, such as checking for an NFC tag
4. The robots will keep an inventory list and stack the block that have arrived in a to-be-determined logic.

The exact workflow is still very open as technical feasibility is evaluated and different microservices are implemented step-by-step. The possible flows have been drawn up by us, one can be found in the README on our Github. The other is a Miro Board, the link to which can be found at the bottom of the page.

The first implementation for the project is the implementation of a broker/translator that receives the sensor data via MQTT and translates them into kafka. This allows us to build different services and processes based on this data later on. It was therefore an important step to implement this first, so we can build microservices that are dependent on the sensor data.

Further, to explore the different aspects of event-driven architectures, we have also decided that we want to incorporate orchestrations as well as choreography in different stages of the project, to be able to show, learn and evaluate the advantages and drawbacks of each of these systems. Placeholders and starts have been made on further microservices as can be seen in the repo.

Next steps will be to build microservices for the robots, and then the conveyor belt and the colour sensor. At the same time we will need to determine the exact workflow that we will implement, decide what kafka topics we need for the services to communicate to complete these topics and determine the logic that we will need for our broker/manager/orchestrator.

We have further sat together to decide certain criteria for the architectural design of the project. For this purpose ADRs were written. The ADRs that have been written on the architectural decisions are documented `/doc/adr` and will be updated regularly over the course of the semester.

The contributions of the different team members can be found under `/doc/contributions_log` and will be updated regularly over the course of the semester.

Link to our Miro board: <https://miro.com/welcomeonboard/TmNQTEpOM3JLakVmVUx5K2tmbDE5Tmp6eVhGTmxuTHN3eTJlZUdH>