SW online summer internship

Agenda

- Day 1
  - Classwork (180 minutes):
    - Present the concept (What you have to do with schematic) - 30 minutes
    - Split in teams of 5 people. – already done
    - Each team must define component responsibilities. - 30 minutes
    - Each team must define required roles (what type of people do you need) - 20 minutes
    - Each team must define **daily** deliverables. - 20 minutes
    - Customer approval session (each team must present their concepts and roles) - 30 minutes
    - Split in teams (already done) and clarify the roles (make sure everyone has a role) - 20 minutes
    - Buffer and brakes - 20 minutes
  - Independent Work (180 minutes)
    - Objectives: as agreed in the customer approval session

Agenda

- Day 2:
  - Classwork (180 minutes):
    - Review day one objectives – 30 minutes
    - Support from Conti as needed – 150 minutes
  - Independent Work (180 minutes)
    - Objectives: as agreed in the customer approval session

- Day 3:
  - Classwork (120 minutes):
    - Review day one objectives – 30 minutes
    - Support from Conti as needed – 90 minutes
  - Independent Work (180 minutes)
    - Objectives: as agreed in the customer approval session

Agenda

- Day 4:
  - Classwork (180 minutes):
    - Review day one objectives – 30 minutes
    - Support from Conti as needed – 150 minutes
  - Independent Work (180 minutes)
    - Objectives: as agreed in the customer approval session

- Day 5:
  - Classwork (120 minutes):
    - Application deployment and evaluation – 120 minutes

Customer requirements

Define and implement a material defect identification and reporting process

- The system must have an embedded component that monitors the production process
- The system should be able to match faulty materials with material supplier information
- The user (customer) should be able to access the information related to faulty materials using a Graphical User Interface
- The information should be stored in a persistent manner
- *Optional: The user (customer) should be able to view defect statistical analysis

Customer requirements

Production monitor. (ESWPM)

Example parameters to be monitored:

- ABS module ID: PN09876
- Resistor bag ID: MAT321
- Used quantity: 10 pcs
- Capacitor bag ID: MAE561
- Used quantity: 5 pcs
- Is the ABS module faulty

Production Line
(virtual and out of scope)

Manufacturing execution system (MES):

Collect the data received from the simulated production equipment

Material data collection (MC).

Optional Statistics application (STAPP):

Create statistics about :

- failed components,
- materials,
- suppliers of faulty components.

Reporting application (RAPP):

Generates report to be shown in the Reporting Interface

Reporting interface (RI).

The customer should be able to view information (type and quantity) related to:

- Faulty components (ex. ABS module 10 pcs)
- Faulty materials
- Supplier of the faulty materials

Set of minimum requirements

Prerequisites

- each manufactured part (or batch of parts) is uniquely identified
- each assembled component (or batch of components) is uniquely identified

Step 1

- **ESWPM:** Using a microcontroller board, simulate an automatic production equipment that outputs:
  - **Part's identifier**
  - **Assembled component's identifier**

- **MES:** Collect the data received from the simulated production equipment
  - **Save the timestamp (date & time) of production and the identifier of the assembled component**

- **MC:** Store the collected data

- **RAPP/RI:** Prepare a report based on collected data
  - **E.g. daily/hourly production rate**

Set of minimum requirements

Add the following features:

Step 2

- **ESWPM:** Using a microcontroller board, simulate an automatic production equipment that outputs:
  - ✓ Part's identifier
  - ✓ Assembled component's identifier
  - **Quantity of assembled components**

- **MES:** Collect the data received from the simulated production equipment
  - ✓ Save the timestamp (date&time) of production
  - **Verify if the received part identifier is valid** (it should be unique and duplicates should not be allowed). If a duplicate is detected, then the existing recording should be overwritten instead of creating a new recording.

- **MC:** Store the collected data

- **RAPP/RI:** Prepare a report based on collected data
  - ✓ E.g. daily/hourly production rate
  - **Find all the parts that were produced using a specified component identifier**

Set of minimum requirements

Add the following features:

Step 3

- **ESWPM:** Using a microcontroller board, simulate an automatic production equipment that outputs:
  - ✓ Part's identifier
  - ✓ Assembled component's identifier
  - ✓ Quantity of assembled components
  - **Add parametric results for each set of data (result of automatic process verification: part is PASS or FAIL)**
  - **Before sending a new set of data, wait for a confirmation/acknowledge of the previous data set**

- **MES:** Collect the data received from the simulated production equipment
  - ✓ Save the timestamp (date&time) of production
  - ✓ Verify if the received part identifier is valid (it should be unique and duplicates should not be allowed). If a duplicate is detected, then the existing recording should be overwritten instead of creating a new recording.
  - **Send confirmation/acknowledge for the received data set (also meaning that you are prepared to receive a new set of data)**

- **MC:** Store the collected data

- **RAPP/RI:** Prepare a report based on collected data
  - ✓ E.g. daily/hourly production rate
  - ✓ Find all the parts that were produced using a specified component identifier
  - **Prepare FAIL parts report in specified timeframe.**

Team organization

- Team size about 5
- Roles:
  - System architect (define the interfaces between components (ESWPM, MES and RAPP))
  - ESWPM architects (write user stories / use cases and create SW architecture)
  - Manufacturing execution system (MES) architects (write user stories / use cases and create SW architecture)
  - APP Requirement architects (write user stories / use cases and create SW architecture)
  - Material data collection (MC) engineers (define data structure)

  - ESW developers (develop and test ESWPM application)
  - MES developers (develop and test MES application)
  - RAPP developers (develop and test RAPP application)

  - Others as needed

Auto/Evaluation criteria – must be filled by the team

30% Overall system

- 10% Does it work
- 10% Scalability
- 10% Does it have clear interfaces

50% Component you worked on

- 10% Does it work
- 10% Cost / Complexity
- 10% Scalability
- 10% Does it have clear interfaces
- 10% Reuse of 3'rd party components

20% Team collaboration / cohesion:

- 10% Did the team meet their agreed objectives
- 10% Did the team managed to respect the previously agreed deadlines

Team composition (to be defined by the team)

ESW:

MES:

MC:

RAPP:

RI:

STAPP:

Daily objectives (to be defined by the team)

Day 1 objectives:

Day 2 objectives:

Day 3 objectives:

Day 4 objectives:

Day 5 objectives: