openSAP

TOUCH IOT
WITH SAP LEONARDO
PROTOTYPE CHALLENGE

MANAGE AND MONITOR CYBER-PHYSICAL SYSTEMS
Manage and Monitor Cyber-Physical Systems

Cyber-physical systems (CPS) are the backbone of production processes that apply principles of Industry 4.0. CPS are intelligent production resources that communicate with each other and the intelligent (smart) products they produce.

Modern production supervisors need monitoring functions to get an overview about the status and executed activities of each CPS and smart product.

The production supervisor shall be able to decide and execute changes of the production process if unforeseen challenges appear that cannot be handled by the CPS themselves.
Persona

Explain the needs, goals, and pain points addressed

Persona

The Modern Production Supervisor

Two of Seven

I like to know what’s going on at the shop-floor especially those situations where I need to step in to support execution of the automated production process

About

• 35, single, 10 years of production experience.
• Was trained to be able to dealt with cyber-physical systems (CPS)
• Is the person who monitors the production process. Removes blockers and show-stoppers that cannot be handled by CPS and smart products.
• Strolls around the production site
• I work with the non-human elements of the smart plant, as well as the chief of production and other technicians

Responsibilities

• I am responsible for ensuring seamless production
• I am responsible for solving uses that cannot be solved by the intelligent CPS and smart products
• I am responsible to provide insight information about the production

Needs

• I need to know the status of the CPS and smart products
• I need to know the error causes that hinder production execution
• I need to be able to react on events to handle unplanned incidents

Main Goals

• Ensure seamless production
• Solve incidents and remove blockers that prevent seamless production execution...
• Communicate effectively and efficiently with CPS and smart products to execute solutions for incidents

Pain Points

• I do not have a quick overview about the status of the CPS and the smart products
• It is hard to identify the location and the reason for a blocked production
• Decision making and execution of the decision is difficult if CPS and smart products are involved
As a modern production supervisor I need a way to access the status of the cyber-physical systems and smart products so that I can react on production issues immediately.
<table>
<thead>
<tr>
<th>ACTIONS</th>
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<th>ACTIONS</th>
<th>ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check status of cyber-physical systems (CPS)</td>
<td>Look where defect CPS is located</td>
<td>Communicate with the CPS</td>
<td>Identify the defect sensor</td>
<td>Inform the CPS to change its status from “Waiting for Defect Check” to “Under Maintenance”</td>
</tr>
<tr>
<td>Walk to the production shop floor</td>
<td></td>
<td>Read the detailed error log</td>
<td>Confirm the replacement</td>
<td></td>
</tr>
<tr>
<td>“Hmm, let’s see what’s going on”</td>
<td>“Oh, oh, I thought everything was ok?”</td>
<td>“How can I help?” “There always problems with Number 5 (does number 5 live?)”</td>
<td>“I thought the shift before already did the replacement?” “Get rid of these defect parts fast!”</td>
<td>“I have all the info that I require from Number 5” “Number 5, take a break”</td>
</tr>
<tr>
<td>MINDSET</td>
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<tr>
<td>FEELING</td>
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<tr>
<td>Control room</td>
<td>Shop-Floor</td>
<td>Terminal of Cyber-physical system</td>
<td>Terminal of Cyber-physical system Mobile Device</td>
<td>Terminal of Cyber-physical system</td>
</tr>
</tbody>
</table>
Prototype

Link to BUILD: https://standard.build.me/prototype-editors/api/public/v1/snapshots/8984f8ad239d62b30e1fc536/artifacts/latest/index.html#/launch_page

START PAGE

Two tiles of shop-floor elements are displayed (smart products and cyber-physical systems):

![Image of two tiles]

SMART PRODUCTS PAGE

After clicking the tile the system displays information about the smart product collection. This collection is currently processed by the cyber-physical system **Number 6**:

![Image of smart product collection]

<table>
<thead>
<tr>
<th>SPC-4711-0472017</th>
<th>In Work</th>
<th>Connected</th>
<th>At CPS Number 6</th>
</tr>
</thead>
</table>

Notifications (4)
- Assembly of collection started at CPS Number 6
- Transfer of collection from CPS Number 7 to CPS Number 6
- Assembly of sub-unit SPC-SU-4711-01 finished at CPS Number 7
- Jul 5, 2017
- Jul 5, 2017
- Jul 5, 2017
- Jul 5, 2017

See All
The overall production process is about 80%. The notifications contain the communication between the cyber-physical systems that are involved in assembly and production of the smart products collection.

**CYBER-PHYSICAL SYSTEMS PAGE**

After clicking the tile the system displays information about the cyber-physical system Number 5 that requires actions by the production supervisor:

It is possible to launch the diagnosis tool or to communicate with the CPS. This page also displays the communication between the CPS units and the production supervisors.

Additional information is shown that provides an easy overview about the current state of the cyber-physical system **Number 5**.
ACCESS THE DIAGNOSIS TOOL

By pushing the corresponding button the diagnosis tool is launched. Currently it is not implemented at all.

COMMUNICATE WITH CYBER-PHYSICAL SYSTEM

By pushing the appropriate button, the production supervisor and the cyber-physical system can communicate with each other. Because of the noise that is produced by assembling the smart products collections, the preferred way is to exchange textual information.