SMARTSIM

DL SMART–SCADA

SCADA SYSTEMS
DEVELOPMENT COURSE

DE LORENZO

SMART SIMULATOR FOR LEARNING SCADA SYSTEMS

The DL SMART-SCADA is a software that has been developed to teach how to develop supervisory control systems in a unique and effective way.

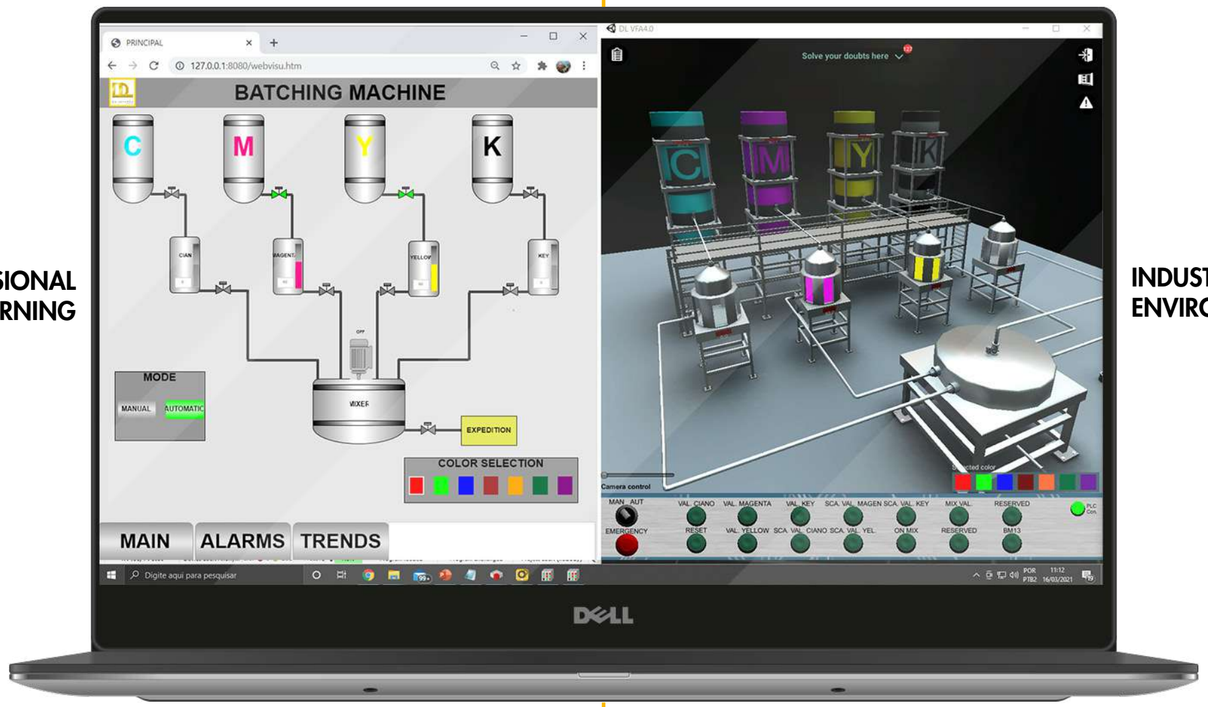
With this software, students can improve their individual experience on studying SCADA systems in practice.

Professors can explore this trainer to provide experiments to students with the following topics:

- **Main concepts of SCADA Systems;**
- **Hardware and software components;**
- **Interaction with controllers, drivers and OPC Servers;**
- **Main elemens and resources: Tags, screens, user interface components, real–time databases, trends, historical data record, animations and user permissions;**
- **Development of projects in 3 different environments (not included): Codesys WebVisu, Elipse E3 and WinCC.**

INDUSTRIAL SCADA SYSTEMS PROGRAMMING TOOLS | **POWERFUL 3D SIMULATOR**

PROFESSIONAL LEARNING



INDUSTRIAL REALISTIC ENVIRONMENTS

PROFESSIONAL EXPERIENCE | **REAL-LIFE SITUATIONS**

REAL PRACTICAL EXPERIENCE TO STUDENTS BY DEVELOPING A SCADA FOR AN ENTIRE PROCESS

EFFECTIVE LEARNING WITH GUIDANCE, REAL-LIFE PROJECTS, THEORY AND INSTRUCTIONS FROM BASIC TO ADVANCED

1

BATCHING SCADA SYSTEM WITH CODESYS VISU

Goal: The student is required to develop a SCADA system for the ink coloring process using the SCADA system Codesys VISU. The reason is that the factory plans to build a control room for the operation of all its processes and machines.

Automation contents: Codesys Visualization and Web Visu development tool, tags, screens, user interface objects, animations, navigation, charts/trends, alarm summary, variables.

Requires Codesys software (Not included)

2

BATCHING SCADA SYSTEM WITH ELIPSE E3

Goal: The student is required to develop a SCADA system for the ink coloring process using the SCADA system Elipse E3. The reason is that the factory plans to build a control room for the operation of all its processes and machines.

New automation contents: OPC Server, Elipse E3, features, screens, tags, navigation, interface objects, charts/trends, good practices for supervisory systems.

Requires Codesys and Elipse E3 software (Not included)

3

IMPROVING THE SOLUTION

Goal: The student is required to implement new features for the ink coloring process using the SCADA system Elipse E3, in order to enhance operation and security of the process.

New automation contents: U sers permissions, recipes and scripting.

Requires Codesys and Elipse E3 software (Not included)

4

BATCHING SCADA SYSTEM WITH WINCC

Goal: The student is required to develop a SCADA system for the ink coloring process using the SCADA system WinCC.

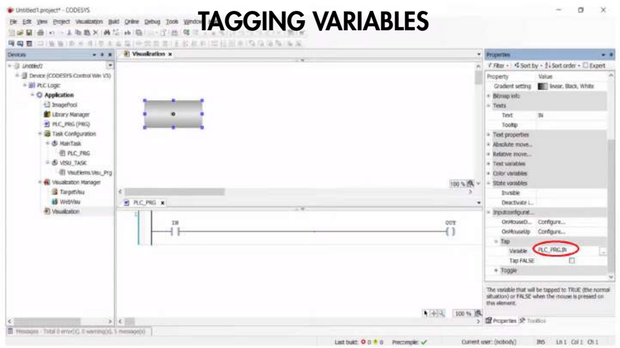
Automation contents: WinCC basics, features, screens, tags, navigation, interface objects, charts/trends, users permissions, recipes, scripting and good practices.

Requires TIA PORTAL STEP7 professional and WINCC advanced software (Not included)

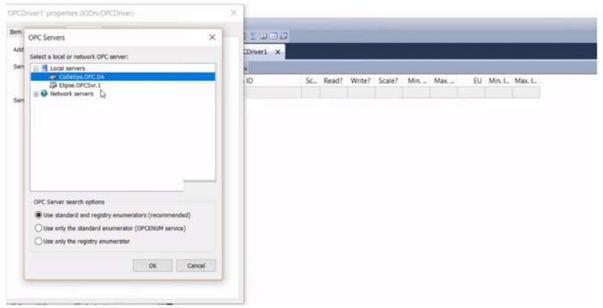
STUDENT CAN LEARN AND PRACTICE FROM BASIC TO ADVANCED
SCADA SYSTEMS TOPICS

With the industrial 3D environments and also the built-in projects it´s possible to develop solutions in different softwares widely used in industries, work with both native and external SCADA software, besides planning and comissioning a project.

TAGGING VARIABLES

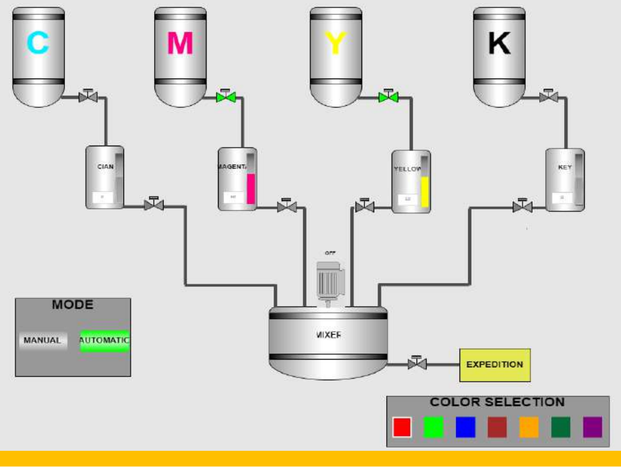


OPC COMMUNICATION



ALARMS

SYNOPTICS



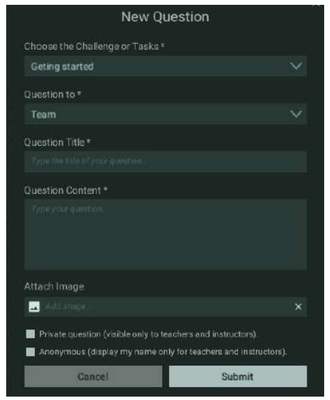
TRENDS

WHY IS IT A SMARTSIM?

IT CONNECTS PROFESSOR, STUDENT AND SCHOOL

De Lorenzo´s cloud server receives students activities and provides reports and analytics to professors and institutions. Besides, a student can start working at school and continue at home or vice-versa.

The platform includes a query and answer system that enables professors to support the students counting on a team of monitors. That means better support with less effort of the professors. The students can see questions asked by other colleagues too so that way if more than one student have the same doubt the professors answer will attend them all.



COMPATIBLE WITH THE DL SMART-DASHBOARD (SOLD SEPARETLY)

PROFESSORS CAN FOLLOW STUDENTS PROGRESS

The professor can do and access everything the student can. Besides, he/she can also access the dashboard's portal. It includes interesting reports and analytics that help the professor to monitor the group in real time, as well as to identify students who are doing very well, as well as those who need help, who are not working at all and who seem to be "cheating".

Tasks report

This is an important tool since it provides evidence of the activities a student worked on. That means the school has evidence of the practical activities the distance learner has done with detailed information about it.

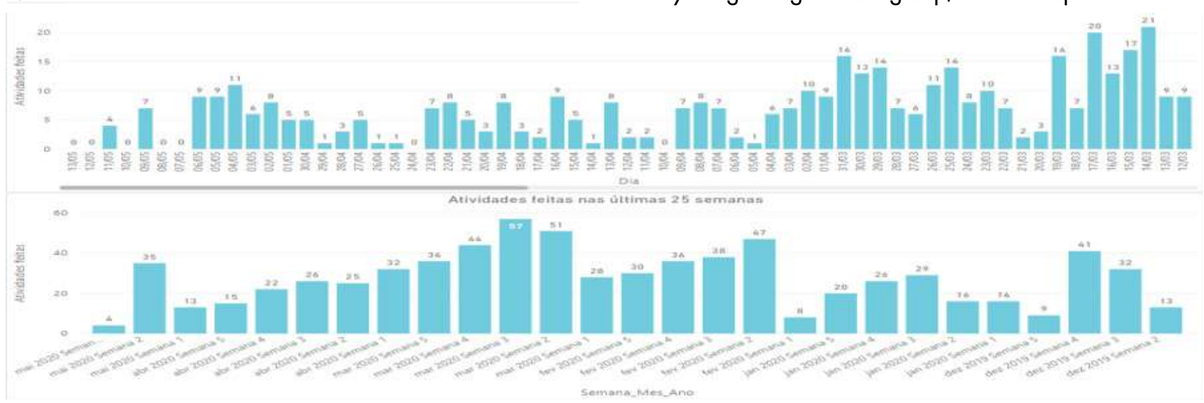
Curso	Tarefa	Timestamp	IsDon
Scripts	1.1 - Abrindo uma tela modal	3/9/2020 6:33:37 PM	False
Desenvolvimento de sistemas supervisórios	2.6 - Implementar Gráficos	11/22/2019 7:14:00 PM	False
Desenvolvimento de sistemas supervisórios	2.5 - Montar interface principal	11/18/2019 5:04:15 PM	True
Desenvolvimento de sistemas supervisórios	2.4 - Construindo os objetos da aplicação	11/18/2019 4:28:54 PM	True
Desenvolvimento de sistemas supervisórios	2.3 - Explorando Recursos	11/15/2019 5:35:44 PM	True
Desenvolvimento de sistemas supervisórios	2.2 - Conhecendo o Elipse E3	11/15/2019 5:10:00 PM	True
Desenvolvimento de sistemas supervisórios	2.1 - Comunicação OPC	11/14/2019 12:57:42 PM	True
Desenvolvimento de sistemas supervisórios	1.8 - Comandos pelo supervisório	11/14/2019 11:25:14 AM	True
Desenvolvimento de sistemas supervisórios	1.7 - Implementando alarmes	11/8/2019 7:33:30 PM	True

PROFESSOR CAN SEE WHICH STUDENTS ARE ON SCHEDULE

With this interface, the professor may choose which groups he/she wants to monitor, to verify who is on schedule, who is pending and so on. It is possible to define the expected progress percentage in relation to the tasks available in the course.

RHYTHM

This other dashboard shows the number of activities the students did daily and weekly. The professor may decide to verify it regarding a whole group/class or a specific student.



EFFORT/TASK DEDICATED TIME

If the professor selects a student, he/she may verify how much time the student took to develop and deliver each task of the course.

Tempo por tarefa

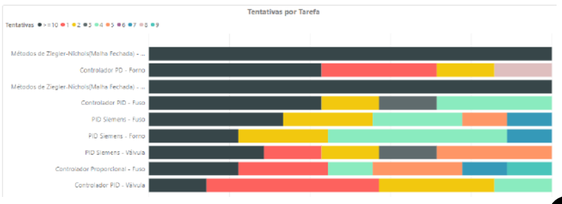
Tarefa	Duracao Total (h)
Controlador ON-OFF - Forno	4.33
Estudando a Planta - Forno	4.08
Controlador PI - Forno	3.14
Resposta transiente e estacionária - Forno	2.50
Estudando a planta - Fuso	2.45
Métodos de Ziegler-Nichols(Malha Fechada) - Forno	2.35
Controlador PD - Forno	1.99
Controlador ON-OFF - Válvula	1.88
PID Siemens - Forno	1.63
Controlador Proporcional - Forno	1.44
Controlador PI - Válvula	1.42
Métodos de Ziegler-Nichols(Malha Aberta) - Forno	1.29
Estudando a planta - Válvula	1.22

PROGRESS VS TIME TAKEN

It is also possible to verify the distribution of the dedicated time with relation to the number of tasks done by each student at any period of time. That helps to identify who is doing well, who may need help, who is doing nothing and who is trying to cheat.

TRIALS PER TASK

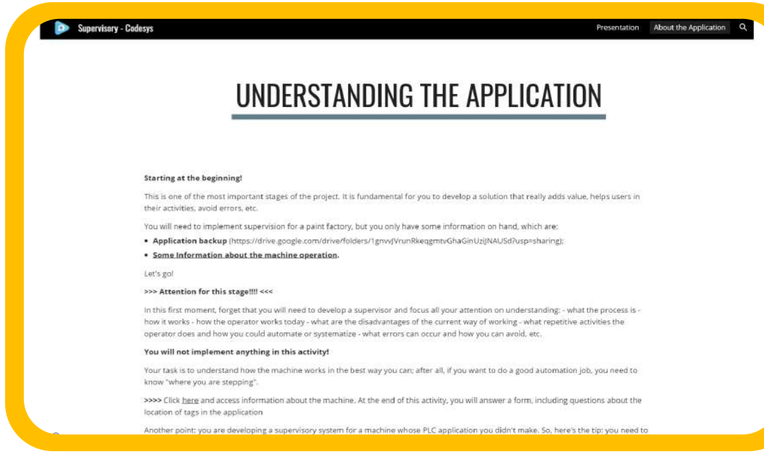
This chart helps the teacher to understand which task may be the most difficult and which one may be the easiest in order to adjust the deadlines.



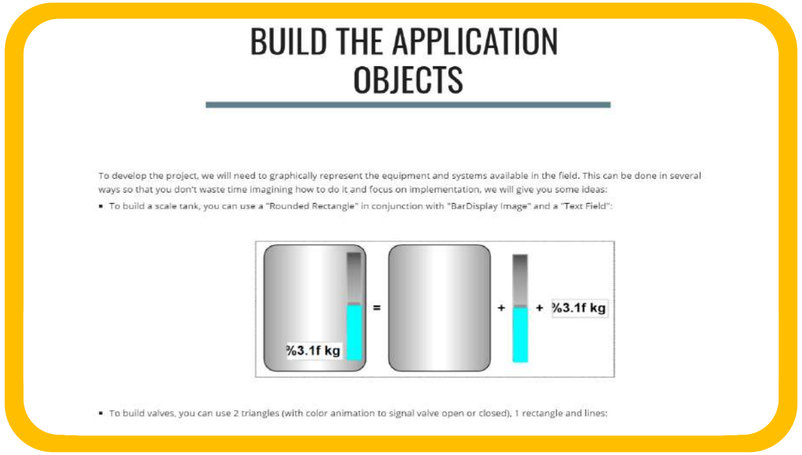
SUMMARY OF FEATURES

IT'S A 3D SIMULATOR

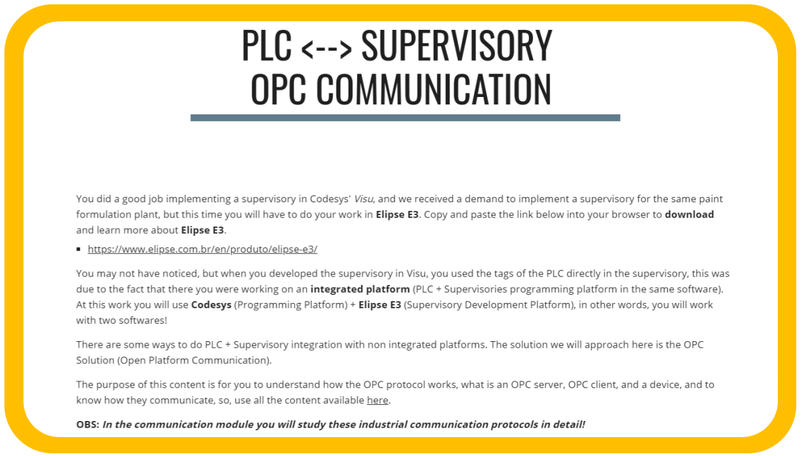
IT HAS BUILT-IN PROJECTS



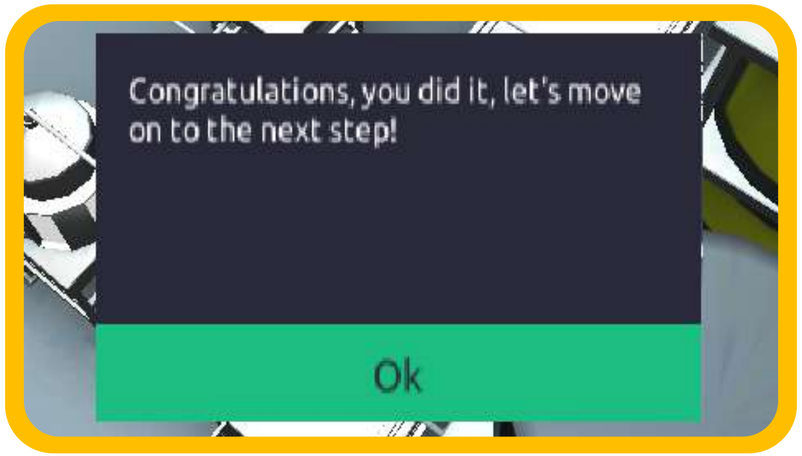
THE PROJECTS INCLUDE GUIDANCE



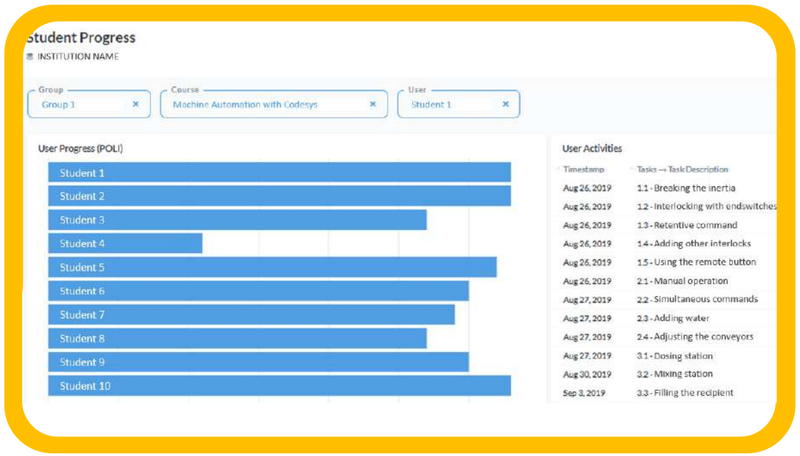
+ CONTENTS AND SUPPORT MATERIALS, SO THEY CAN LEARN BY THEMSELVES



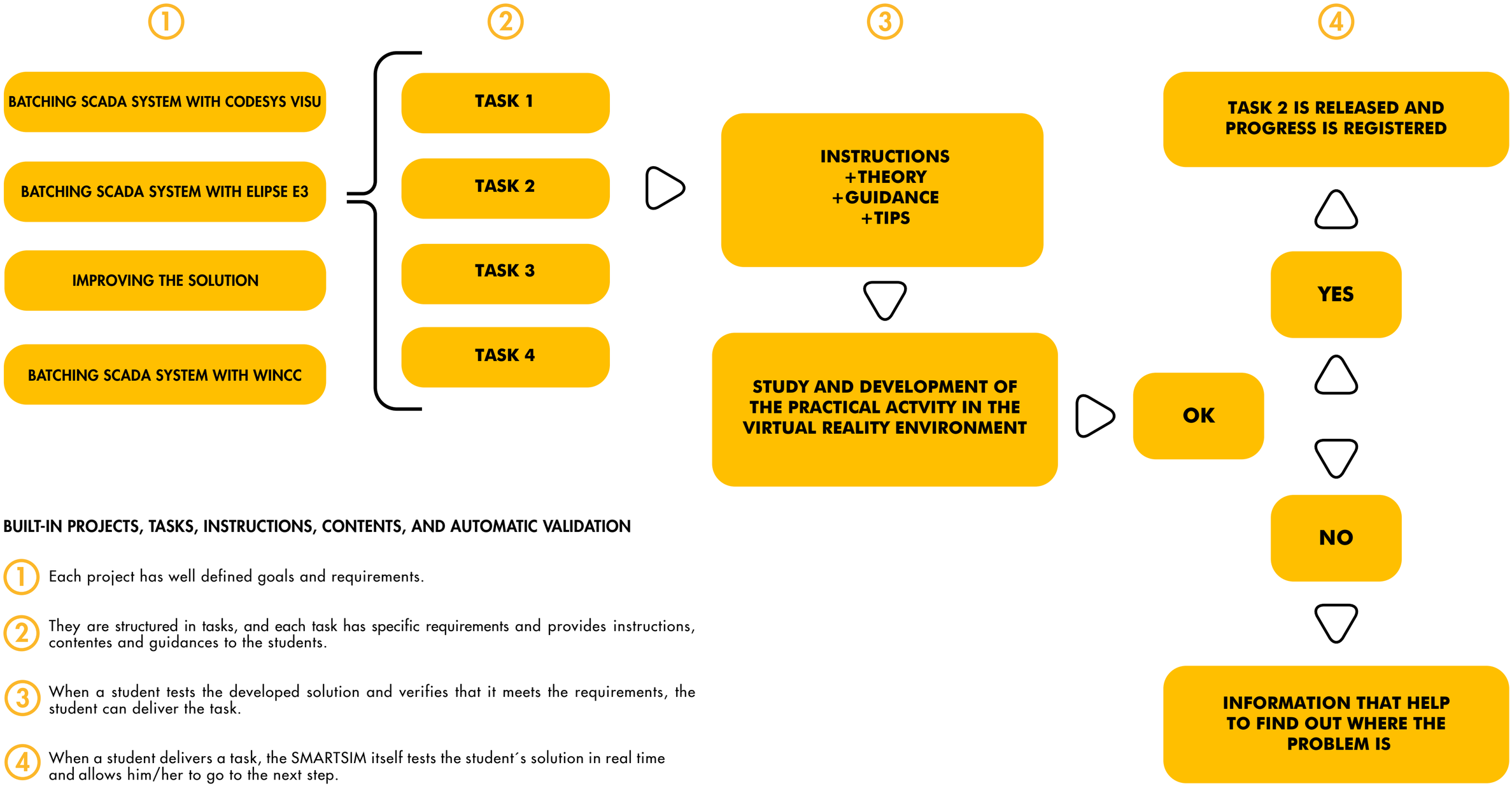
IT AUTOMATICALLY CHECKS STUDENT ACTIVITIES TO LET THEY MOVE ON, LIKE IN GAME



PROFESSORS CAN MONITOR STUDENTS, AND VERIFY WHICH POINT THEY NEED HELP
Option available with Dashboard



HOW ARE BUILT-IN PROJECTS STRUCTURED?



BUILT-IN PROJECTS, TASKS, INSTRUCTIONS, CONTENTS, AND AUTOMATIC VALIDATION

1. Each project has well defined goals and requirements.
2. They are structured in tasks, and each task has specific requirements and provides instructions, contentes and guidances to the students.
3. When a student tests the developed solution and verifies that it meets the requirements, the student can deliver the task.
4. When a student delivers a task, the SMARTSIM itself tests the student´s solution in real time and allows him/her to go to the next step.

SYSTEM REQUIREMENTS

ORDER CODES

DL SMART-SCADA

SCADA SYSTEMS DEVELOPMENT COURSE

DL SMART-DASHBOARD

CLASSROOM MANAGEMENT FOR SMARTSIMs

IMPORTANT NOTE:

THIS PRODUTS DO NOT INCLUDE ANY THIRD PARTY SOFTWARES.

TO OUR KNOWLEDGE, CODESYS DEVELOPMENT SYSTEM CAN BE FREE DOWNLOADED AT CODESYS WEB SITE

ELIPSE E3 HAS A DEMO VERSION AVAILABLE AT THE WEBSITE AND AN EDUCATIONAL VERSION CAN BE PURCHASED FROM ELIPSE.

TIA PORTAL STEP7 PROFESSIONAL + WINCC ADVANCED HAVE TRIAL VERSIONS AND AN EDUCATIONAL VERSION ON SIEMENS WEBSITE

MINIMUM REQUIREMENTS

OPERATIONAL SYSTEM

64-BIT WINDOWNS 10

DIRECTX VERSION

DIRECTX 11

PROCESSOR

INTEL i5 9400F OR AMD RYZEN 5 3600

MEMORY

8GB

GHRAPHIC CARD

STORAGE

HDD (1GB)

RECOMMENDED REQUIREMENTS

OPERATIONAL SYSTEM

64-BIT WINDOWNS 10 PRO

DIRECTX VERSION

DIRECTX 12

PROCESSOR

INTEL i7 9700 OR AMD RYZEN 7 3700X

MEMORY

16 GB

GHRAPHIC CARD

NVIDIA GTX 1050 TI 4GB OR RX 550 4GB

STORAGE

HDD (1GB)