WP3- Trainings

TalentJourney

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Holistic view to IoT

Group 1 starts here and moves to the right

Content:
IoT state of the art with respect to smart manufacturing, devices and concrete examples. Aim is to provide full understanding of the eco-system of IoT in industrial environment. Industry 4.0.
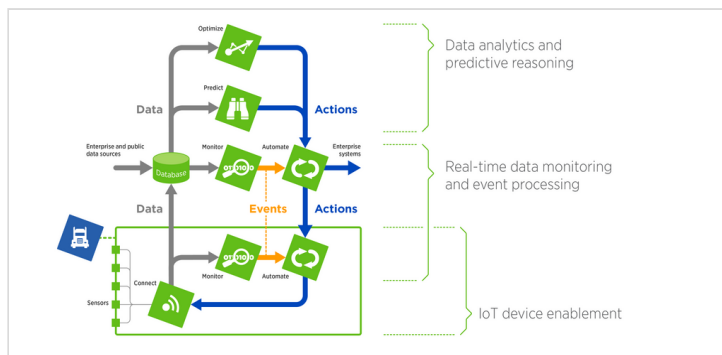1. Communication between sensors and system
2. Data monitoring and analysis
3. System optimization according to analysis.

Pedagogic Tool:

Schedule:
week 3

Image source

Needs to be based on fundamental pedagogical principles. Careful language requires to be understood, in terms of verbs so that the level being taught is measurable.

Need to demonstrate the connection between all themes. Works only if there is concrete examples. The pedagogy should be collaborative approach - in delivery, should refer to the Hattie effect to see if it work for teachers and is understood from learners.

Interdisciplinary projects

Prototype applications with boards

Learners solve a 'real-world' problem & work with a known product (i.e. production of an average vacuum cleaner, how data/IOT is utlised to make that happen)

Iot allows the interoperabilty of different systems and this produces a domino effect in the society, it could be interesting to study some real cases

The Internet of Things (IoT) many industries are seeing initial rollouts of these solutions that promise to provide significant value to both customer and vendor. The natural reaction is to treat this as a technology initiative, focusing on how best to bring together data from smart, connected devices. And in certain cases, this approach has merit.

Robotics

Content:
Robotics state of the art in smart manufacturing, collaborative robots, QA-oriented robots, examples of robots driving manufacturing growth

Pedagogic Tool:
Open space and Inquiry-Based Learning

Schedule:
week 4

Connect with competitions to motivate learners

Simulation tools

They can be free of charge or donated from companies

Robot babysitting

Companies can donate robots themselves for learners to work with (i.e. optimise robot/robot component, also offer feedback to the company). Meanwhile the learner uses hands-on learning approach to explore how and fully understand the robot/robot components work

Digital twins

Group 2 starts here and moves to the right

Content:
Virtual replicas of physical devices, 3D simulation and optimization in smart manufacturing

Pedagogic Tool:

Schedule:
week 6

Examples

Welding simulator
Driving simulator

How Digital Twins Accelerate the Growth of IoT
Internet of Things (IoT) represents a digital mesh of internet-connected devices. IoT comes in various forms and sizes. They could be in your living room as a smart virtual assistant, a smart home security system, or your car in the garage.

IOT FOR ALL

Industry 4.0
Adding a new workstation to a production line requires in-depth planning - especially if regular operations are expected to continue at the same time. The Czech car manufacturer has made use of a 'digital twin' to successfully install and integrate a new robot station at the ŠKODA AUTO component plant in Vrchlabí under these conditions.

VOLKSWAGENAG
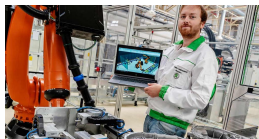
Digital twins are of course very important because they can help to practise and when we can make something it will be easier to understand the content and it will be also much more interesting

Production design simulation

Tools like technomatics (by Siemens)
There are other less complex tools, for example we use Extend

https://process-simulator.de/en/process-simulator/process-simulator-evaluation.html?gclid=CjwKCAiA2O39BRBjEiwApB2IkioqsB4s

Project-based module: learners develop actual digital twins

practical examples and how to use it in simulations

Green skills

Content:
Sustainability, technical skills, knowledge, values

Pedagogic Tool:

Schedule:
week 7

This should be integrated into the modules.

it will be useful to discover real examples

Low-carbon, circular economy must be a part of each module

Connect to the SDGs

Understand the impact of the industry/practice in the world on a social and environmental level + how to apply technologies to reduce this impact

Projects

Practical projects - simple - zero energy house/garden involve ethics in thinking how our actions influence to environment/society/economy

Green skills should be connected with all modules

Service robots

Group 3 starts here and moves to the right

Content:
Service robots state of the art, mobile robots driving versatile smart manufacturing and factory logistics, Exoskeletons empowering and supporting workers, humanoid robots

Pedagogic Tool:
Video lessons, Discussion groups

Schedule:
week 10

Virtual programming to get a practical idea how the coding is related to service robots movement
to get as tangible experience as possible

Industrial and personal use examples

Work with simulators

VR, AR and gamification in smart manufacturing

Content:
Virtual and augmented reality tools and gamification in smart manufacturing, application examples, learning by gaming

Pedagogic Tool:

Schedule:
week 12

VR can be also implemented in "digital twins"

use VR / AR app with the mobile phone and get a practical ecperience of that reality (VR or AR)

using VR in a 3D work environment

IoT

Group 4 starts here and moves to the right

Content:
Applied IoT project. Training will provide deeper understanding how the data of sensors will be transformed to machine-readable code. Training includes simple case of building an IoT device like temperature sensor from scratch and making the REST API that can then provide sensors data to any other system.

Pedagogic Tool:

Schedule:
week 15

Digital workshop

- Due to covid-19, we can imagine this to be digitised via AI/VR glasses to best visualise this normally 'hands-on' training
- Video content available after the workshop end (e.g. YouTube tutorials)

IoT and remote control, real pratical examples

Use simple Arduino based training for beginners

IoT and data enabled services

Content:
Cloud services, IoT and ERP

Pedagogic Tool:

Schedule:
week 17

Blended trainings

- Webex classes, pre-exisiting trainings /programmes
- Data mining workshop
- Package of info (documents including most up to date information)

Learn from ML experts at Google

Whether you're just learning to code or you're a seasoned machine learning practitioner, you'll find information and exercises to help you develop your skills and advance your projects.

> **Education - Google AI**
> Learn with Google AI. Whether you're just learning to code or you're a seasoned machine learning practitioner, you'll find information and exercises in this resource center to help you develop your skills and advance your projects.
> GOOGLE AI
>

AI

Group 5 starts here and moves to the right

Content:
Data science, data analytics, deep learning, neural networks, AI in Education

Pedagogic Tool:

Schedule:
week 19

code learning - language learning

good practice how AI is used in the companies

how companies are using the technology of AI

Simple algorithms

how algorithms work in practice. It had to be on secondary school level

Connect it to examples learners can relate to

Connect it to examples that are present in learners' daily life (e.g.: appliances, technology they use, etc.). Provide trainings according to this approach.

Use prototype board (Arduino) and a google AI service to implement a first tangible sample.

Workshop in which VR glasses are used

Consider the ethical side of it

Properly communicate and bring awareness on ethics regarding use of data and AI (both for development and use)

Social Dilema

Documentary

Cybersecurity

Content:
Cybersecurity elements, threats, benefits, challenges

Pedagogic Tool:

Schedule:
week 21

Explaining WHY

To see big picture. Explain with the every day examples.

Legal implications

Raise awareness on legal implications related to cybersecurity (hacking, attacks, etc.)

Raise awarness on threats and oppotunities of cybersecurity

Ethics

Law
Rules
Legal implications - hacking

Interactive video/computer game in which someone is trying to breach you

Bad practice examples/demos & identifying game: Users must sift through phishing emails/untrustworthy data sources

SIMULATION ACTIVITIES/LABS Example: https://www.immersivelabs.com/labs-and-content/cyber-crisis-simulator/

prerequisites considered for each level of study

practical example of hacking

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