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Challenge: Finding the solution 4.0 to improve our supply chain.

IT and logistics working together!

(Document for teachers)

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Time to solve the challenge

20 hours

Description of the situation

You work in a company that designs, produces and sells drones. You have received an order to produce a quadcopter with a camera embedded.

The logistics department processes the order and sends it to production. But the production manager tells you that they miss a part to produce the drone (the frame of the quadcopter) and your company won´t be able to deliver the product in time, losing the customer, as a result.

It´s not the first time something like this happens and the management of the company wants to solve this for good. Therefore, the logistics and the IT department of the company are called upon a meeting to find possible solutions. In particular, the management wants you guys to propose solutions to avoid these past situations:

- Lack of stock of key production parts (be aware of: better stock management, anticipation of demand, changes in demand, better communication with the providers of the different pieces…).
- Defective assembly or damaged pieces or final product.
- Sale returns due to difficulties for the final user to pilot the drones and/or use their features.
- Delays in transport or delivery of damaged goods or packaging.

The management gives you 3 days to come with possible solutions, for these troubles in the supply chain. For the solutions given, you will need to describe:

- The specific problem you are addressing.
- Which part of the value/supply chain is being affected, how and which are the consequences in other parts of the value/supply chain.
- The solution proposed and the digital tool / technology necessary to implement it. You will also need to describe which steps are necessary to implement it (buy equipment, programming, reorganization, training of workers…)
- The sources used to identify the solution proposed and possibly a success story behind it which supports it.
- The expected benefits of the solution in your company.

Learning objectives

LO1: Understanding the concept of value chain and the roles of IT and logistics in it.

LO2: Understanding the interdependences existing between the IT and logistics departments in a value chain.

LO3: Apply different IT tools in order to improve the logistics operations in a value chain.

L04: Being able to work as a team with peers from different technical backgrounds in order to solve a common challenge.

Minimum requirements to carry out the challenge

Previous knowledge	Equipment/software	Training resources
-Being able to describe a supply/value chain, identifying the different activities within. - Being familiar with the different Key Enabling Technologies related to digitalization/ industry 4.0 - Being familiar with different IT solutions used in logistics	Internet connection. Laptop / computer/ tablet. Projector.	INTENT multidisciplinary didactic unit and training materials on logistics and IT. Students are free to search for other sources of information on-line or off-line. Finding and selecting the right information is also part of their challenge.

Schedule of the challenge

Suggested below are notional time allocations for the challenge:

- 1 hour to identify the parameters of the challenge (possibly including identifying who will carry out which task (s))
- 6 hours to look for information
- 2 hours to select information
- 3 hours to generate alternatives

- 4 hours to present proposals / collate findings and discuss them (within the student´s group)
- 1 hour to identify how findings will be presented (if not stipulated by teacher)
- 2 hours to prepare findings into appropriate format i.e. PowerPoint for presentation
- 0,5 hours to present / discuss findings
- 0,5 hours to evaluate / assess how you carried out the challenge and how you might make improvements for the future

Presentation of the results

The findings can be presented in whatever media the group decide upon. The findings must be in a form that can be retained following the challenge.
This could be a presentation of the findings, which may include but is not restricted to the following formats:

- Video
- Presentation using Software
- Oral \ verbal (This would need to be recorded)
- Written report
- Blog / vlog /wiki
- Any other suitable medium

Note: Teachers should decide the appropriate format for the students to present their results.

Possible solutions to the challenge

The following *solutions are* **suggestive** only and are provided as guidance to support the assessment by the teacher. However, the students are encouraged to be creative and they can offer a variety of solutions not gathered here that are as valid (or even more valid!) that the ones suggested below:

- One possible solution to guarantee the pieces to assembly the drone, could be to count with an ERP type system (For example: Transkal, Java or similar) that allows us to control the availability of the different parts of the drone that we have to assemble (propellers, chassis, motors ... etc). In this way, we will ensure that the assembly of no drone is left on half.

- A good way to ensure that if there is a problem in the assembly, it can be moved forward, would be to establish a video camera system, to detect possible failures.

- To avoid sale returns and facilitate the use of the drone, the company can offer on-line support via a videoconference system and/or publish video tutorials. A 24hours support chat could also be a good solution.

- Smart pallets, transport equipped with GPS and Wi-Fi which updates position every certain time can increase transparency and anticipate problems both in outbound and inbound logistics, facilitating the follow up process of the products to the company and to the customer.

Assessment criteria

The suggested assessment criteria can be found at the end of the didactic unit. Please notice that the criteria you will find there are only minimum, and will depend on the learning aims set by yourself (or by the subject/module you teach). We also suggest to use a 360º evaluation approach, meaning that you evaluate each of the students but also each student evaluates him/herself and each of the members in his/her team. The criteria can (and should) be the same in all evaluations, but the weight of each result will be decided by you.