

74th ESGI

EUROPEAN STUDY
GROUPS WITH INDUSTRY
IN PORTUGAL

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Universidade de Aveiro

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PT
MATHS
IN

rede portuguesa
de matemática
para a indústria
e inovação

working groups

CHALLENGE 1

Lotsizing and Scheduling in BA Vidro

industry_ **BA Vidro**

sector_ **Glass**



Our challenge is to answer the following question:
What is the optimal stock level (measured in production days*) for the company's Sales Plan? This problem leads to these two sub questions:

- What is the optimal production batch for the current mix of the annual Sales Plan?
- How many job changes should the current sales plan require considering the existing Production Structure?

*production days are (average stock of last 12 months/production of the last 12 months) x 365,

CHALLENGE 2

industry_ **Bluepharma**

sector_ **Farmaceutical**



A legal obligation for the Pharmaceutical Industry is to monitor the quality of their products during its life cycle. The activity of development new pharmaceutical products (generics) leads to a high number of batches to test to accomplish with an ICH Stability Program and the timelines are critical. The problem is how to manage and schedule the tests of several projects that run at the same time, to avoid delays in the answers.

CHALLENGE 3

How far can we go in aluminum extrusion

industry_ **Extruverde**

sector_ **Building Materials**



Extrusion of aluminum is an efficient manufacturing process which allows continuous production. The heated billet (aluminum material) is pushed through a metal die to produce the desired profile. A long continuous production increases aging of the die and hampers its capability to yield homogeneously shaped profiles. Hence the dies are usually removed before their breaking point and only go back into production after receiving a layer coat for protection of the metal. The main goal here is to find the optimal life cycle for a die.

CHALLENGE 4

Food distribution by a food bank among local social solidarity institutions

industry_ **Food Bank of Lisbon**

sector_ **Social Economy**

“Fighting food waste and getting food to the people who need it.”
A great variety of products is delivered to several Institutions with different profiles on a regular basis. Given certain restrictions on food supplies, the aim is to improve the channeling of the products to the Institutions in need according to their main characteristics and activity.

CHALLENGE 5

Evaluation of taxi services provision on airport terminals curbside for picking up passengers

industry_ **Globalvia**

sector_ **Engineering Consultancy**



Road accesses at terminal curbsides have a great importance in passengers experience at airport arrivals and departures. Waiting time for transportation, long pedestrian paths and lack of information may cause discomfort and bewilderment. In an effort to improve private and public transportation at the front of airport terminals, an evaluation on capacity and level of service should be carried out, for taxis at arrivals and private vehicles at departures, considering an angle parking at the curbside.

CHALLENGE 6

Checkout area design

industry_ **Sonae**

sector_ **Retail and distribution**



To have a successful shopping experience in an hypermarket, customers need to be able to efficiently find the articles they are looking for and to quickly check-out of the store. In order to serve their customers (check-out and pay) in a cost-effective way, retailers need to configure and size their check-outs solutions by defining: the number of checkout posts; what type of checkout: normal and self service; how many check-outs of each type. The main goal is to analyse the ideal check-out configuration for the desired service level.

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