

Valispace teaches concurrent engineering at International Space University (ISU)

MSS19 students built future lunar base using Valispace



What is concurrent engineering?

Within a project, teams of engineers work on the same data at the same time. This allows for discussions to be data-driven and decisions can be therefore made quickly. For example, in an early design phase, by having a concurrent design workshop, 10 engineers could create a first product design in 5 days, a proven methodology in the space industry. In a late design phase, up to hundreds of engineers can collaborate for years using the same data source even across company borders.

Why do we teach this?

The development of complex hardware products such as satellites, rockets, drones, robots, submarines and chemical facilities today involves thousands of documents, user manuals, test reports and interface data sheets – as was the case 40 years ago. Valispace was founded by aerospace engineers in a bid to put Excel engineering to the sword and drive digitalisation in hardware development. “If there are 20,000 official and 300,000 unofficial, inconsistent documents on a server for a single project, it’s not surprising that complex engineering projects are so expensive,” says co-founder and CEO Marco Witzmann. He adds: “While software engineering has become a lot more efficient in the past few years, industrial companies are lagging

behind when it comes to hardware development. Valispace cuts engineering costs by more than 15 percent. That's a huge sum of money in major projects."

What did the students do?

The concurrent engineering workshop of the Master in Space Studies (class MSS19) explores the design of a lunar mission using the Valispace software. The goal was to learn about concurrent engineering principles, by doing the hands-on exercise of creating a lunar base in 2 hours. This was achieved by allowing participants to collaborate during the design phase through a guided exercise.

Every team of 4-8 people was split up, so that each the four subsystem has a responsible. In the first part of the exercise, all subsystem teams work simultaneously to arrive at a solution that fits into the scope of a lunar base. During this part, dependencies between different subsystems revealed themselves and students had to learn how to work concurrently. After the first part, just as in any space mission, the client shared updates in parameters. For example, astronauts got better training, meaning that the time it would take for them to perform a specific EVA has shortened. In the second part of the exercise, systems engineering budgets, a concept of operations and a product tree of the complete lunar base were created by students. Ultimately, in the form of a discussion, lessons learned were shared to consolidate the insights of the exercise.

About Valispace

Valispace GmbH was founded by three engineers in 2016 and secured a €1 million seed investment from HTGF in 2018. Valispace has developed a system that performs the laborious task of data documentation so that engineers don't have to, giving them the freedom to drive further innovation.

Valispace has been named in Forbes as one of Germany's 100 most innovative Startups 2018, has been featured in Wired and TechCrunch and won multiple startup awards.

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