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CELISE Symposium in Warsaw

Virtual reality as a tool to optimise resources and processes in science, technology and innovation projects: CELISE case study

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Instituto de Investigación
en Ingeniería



Fernando Colmenares – Short Biography

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I am a Mechanical and Aeronautical Engineer from Warsaw Polytechnic University in Poland, Master in Engineering with emphasis in Turbines and Internal Combustion Engines from the same university. Specialist in Engineering Project Management from the EAN University of Colombia. PhD in Engineering with emphasis in Energy Systems and Optimization from Cranfield University, United Kingdom and Postdoctorate in Aerospace Engineering from the same university.

I am currently:

Director of the Engineering Research Institute and Professor Dr. at the Universidad Cooperativa de Colombia; Founder of the STI network initiative BERSTIC between Colombia, UK, EU, USA and China. Research and Innovation Director of Vocate Ltd in the UK. Advisor and evaluator of UK Research and Innovation and MinCiencias in Colombia. Member of the COST Network (European Cooperation in Science and Technology); among others.

For more information please consult the following links:

<https://fernandocolmenares.co/>

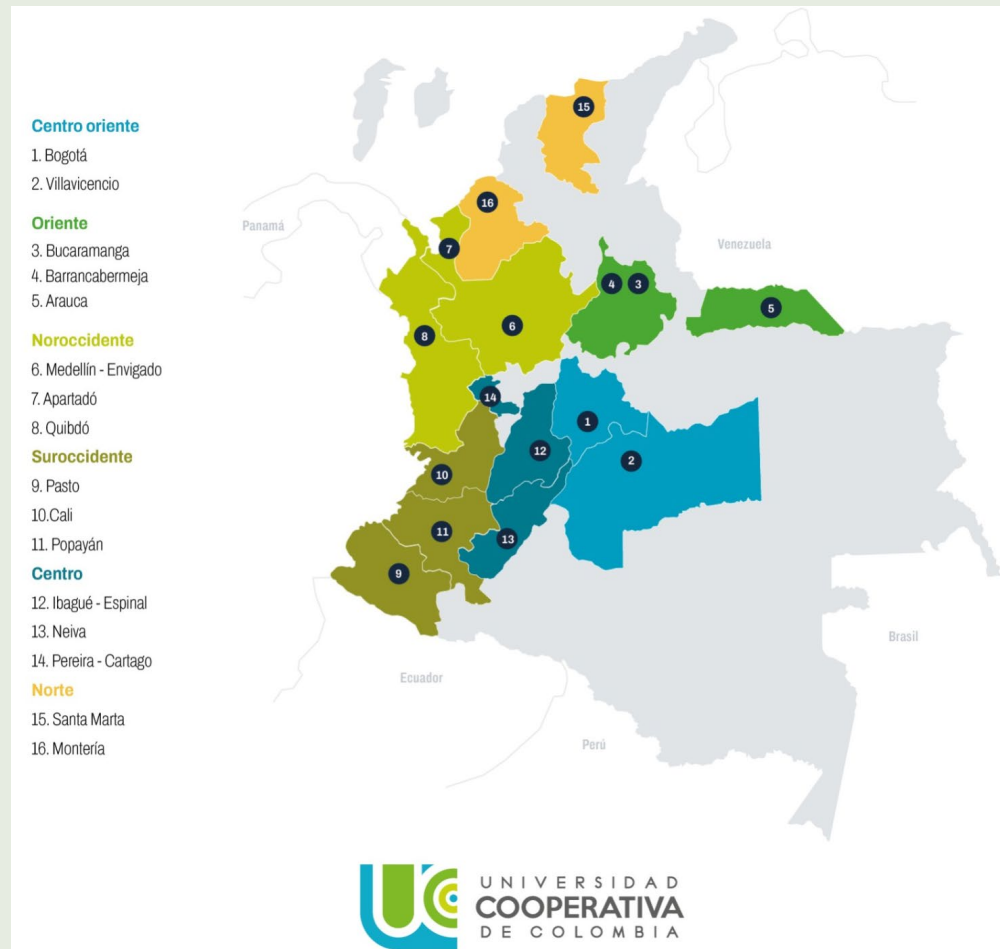
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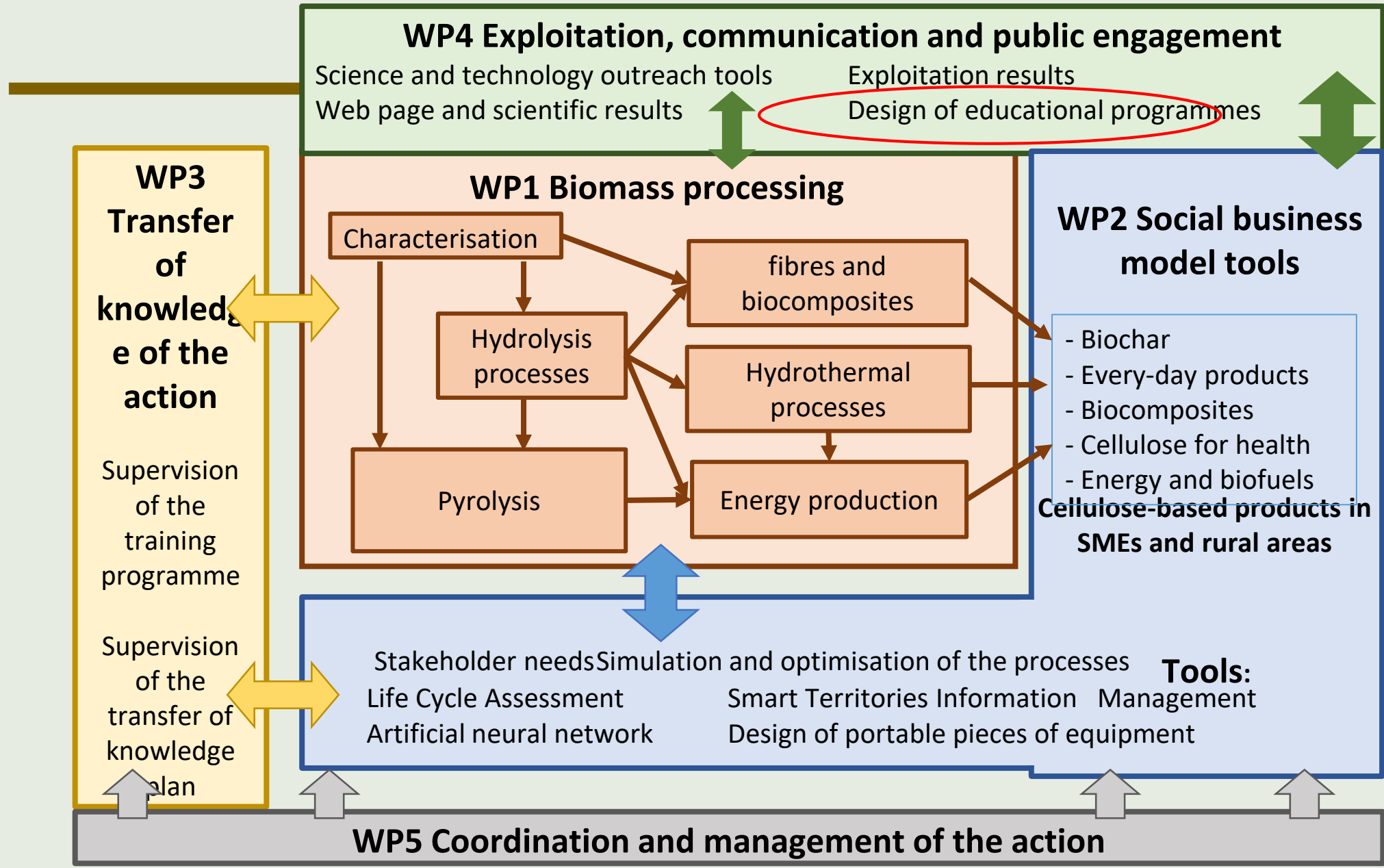
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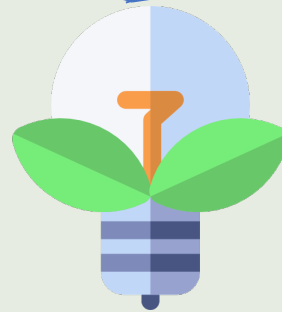
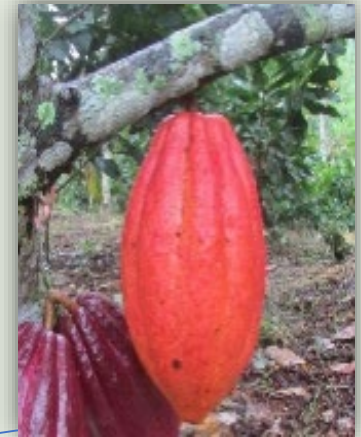
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Virtual reality - CELISE project

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Technology: Exeter retort by Carbon compost, UK

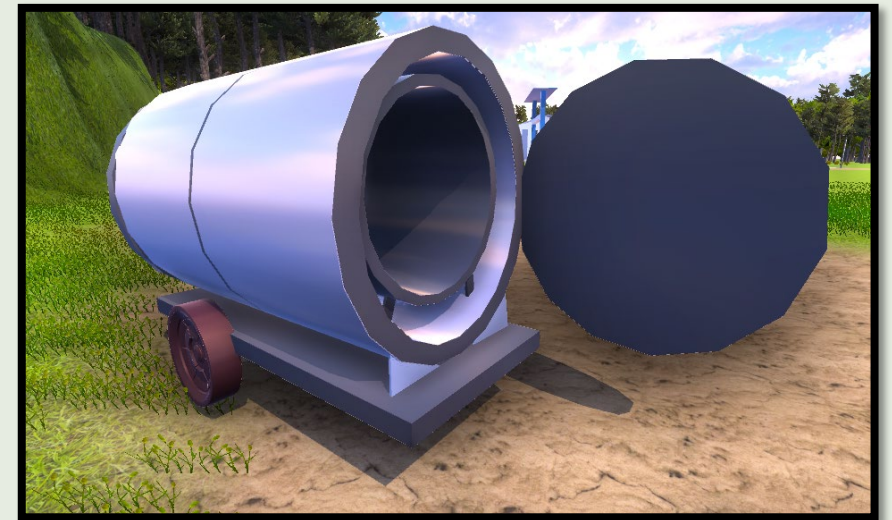
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Digital Twin

REAL

VIRTUAL



CHARCOAL PRODUCTION

BIOFUEL from wood, cocoa, coffee residue pyrolysis -> **CHARCOAL**

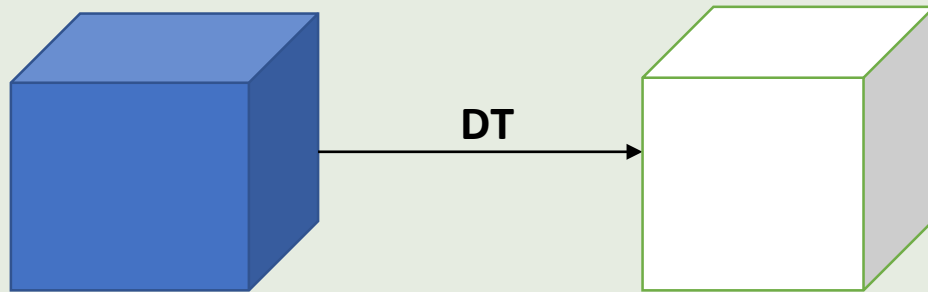


Technology Learning

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With this virtual environment of Agrosavia, the player will learn about the cocoa process, as well as the collection of the type of seed and what end products can come out of these and their subsequent transformation into sources of energy or fuel through the use of the **DIGITAL TWIN** charcoal machine.



THEORETICAL -> THEORETICAL PRACTICAL -> PRACTICAL

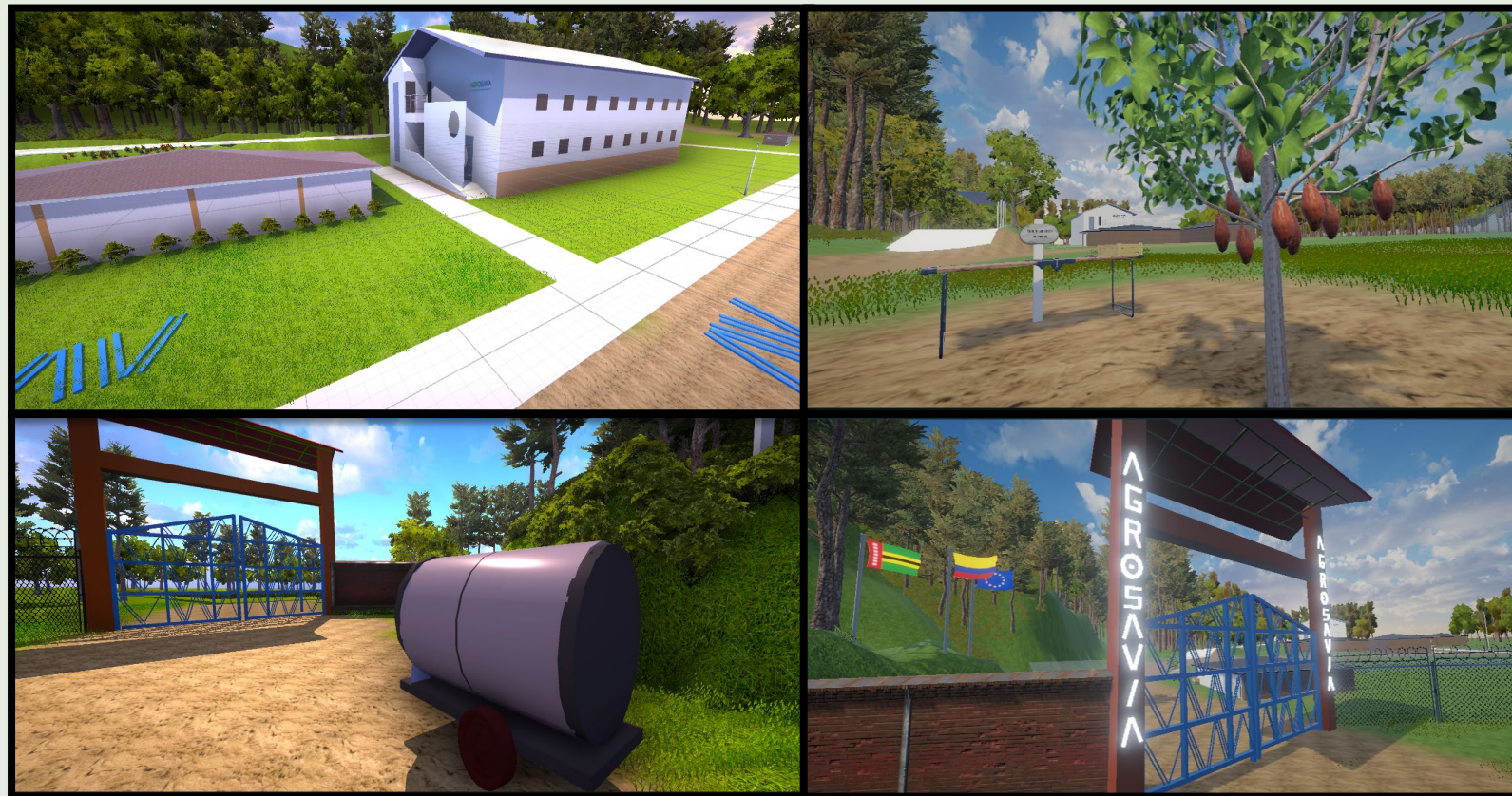


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PROJECT AGROLAND CELISE

DESIGN AND
DEVELOPMENT
PHASE



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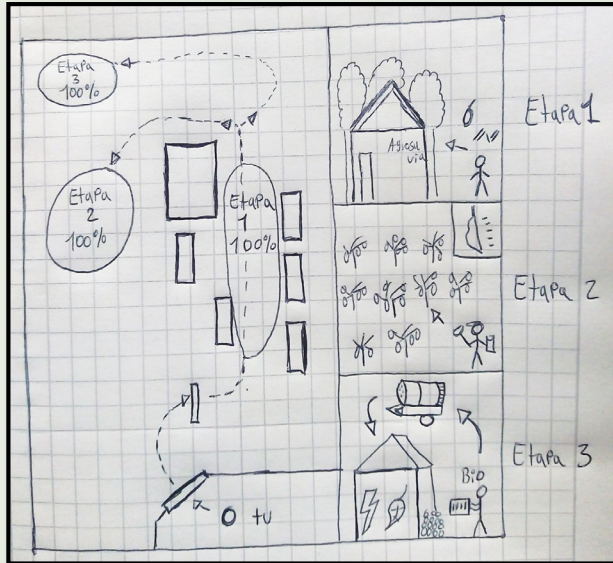
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N° 8



Pedagogical technique: Gamification

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Benefits of virtual reality

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- VR training reduces the incidence of workplace injuries by 43%.
- VR training has a retention rate of 75%, outperforming lectures (5%), reading (10%) and audiovisual learning (20%).
- 39% of large organizations leverage AR/VR technology to facilitate training in simulated environments.
- It is 4 times faster than the average face-to-face training.

Source: [https://financesonline.com/virtual-reality-statistics/#:~:text=VR%20training%20reduces%20the%20occurrence,%25\)%20\(FrontCore%2C%202020\)](https://financesonline.com/virtual-reality-statistics/#:~:text=VR%20training%20reduces%20the%20occurrence,%25)%20(FrontCore%2C%202020))



Benefits of gamification

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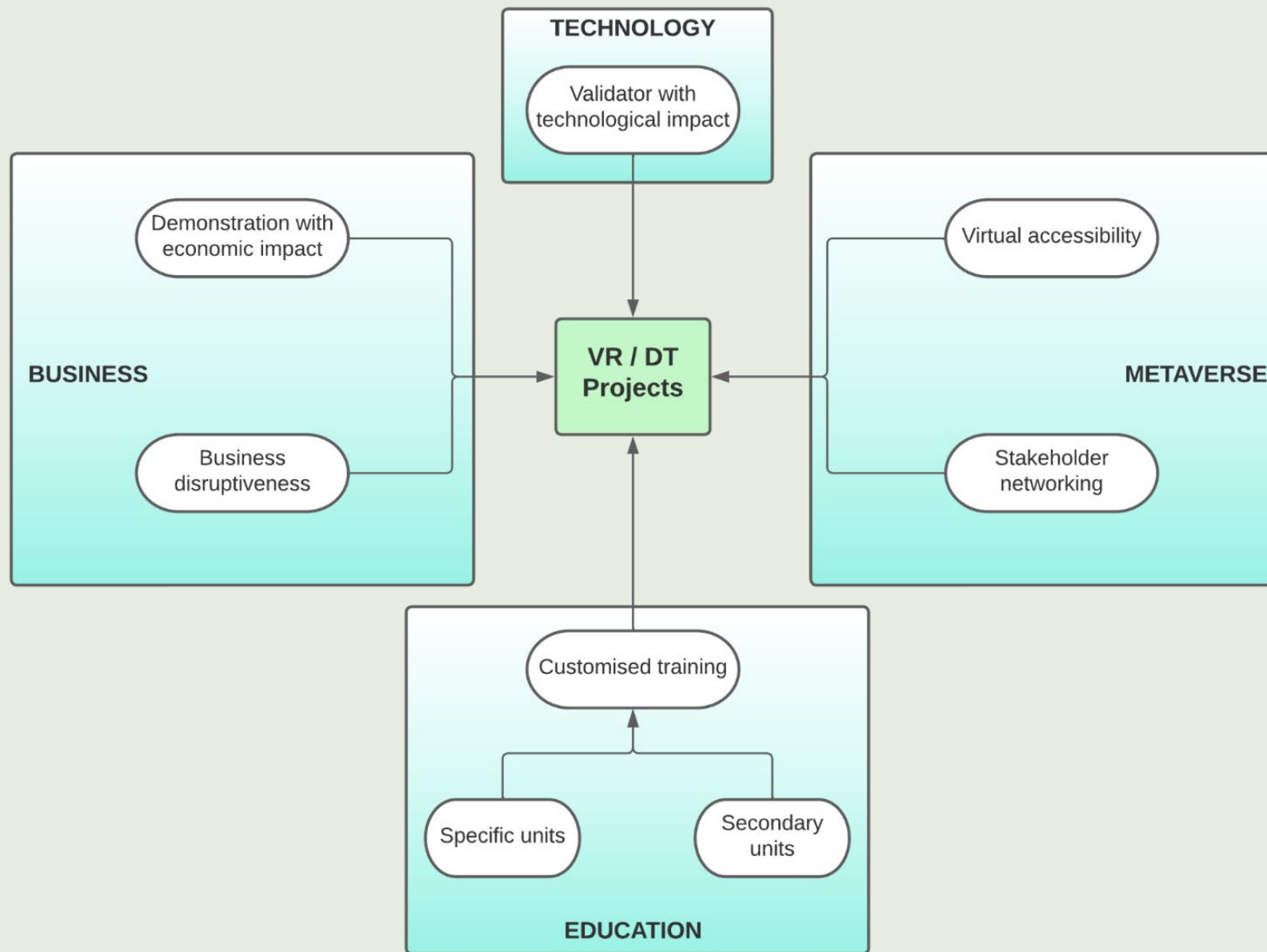


- Activate **motivation** for learning
- Constant **feedback**
- More significant **learning** allowing greater **memory** retention by being more **attractive**
- **Commitment** to learning and loyalty on the part of the student with the content and with the tasks themselves
- More **measurable** results (levels, points and badges).
- **Generate adequate skills** and digital literacy
- More **autonomous learners**
- They generate **competitiveness** as well as collaboration



Virtual reality and Digital twin structure

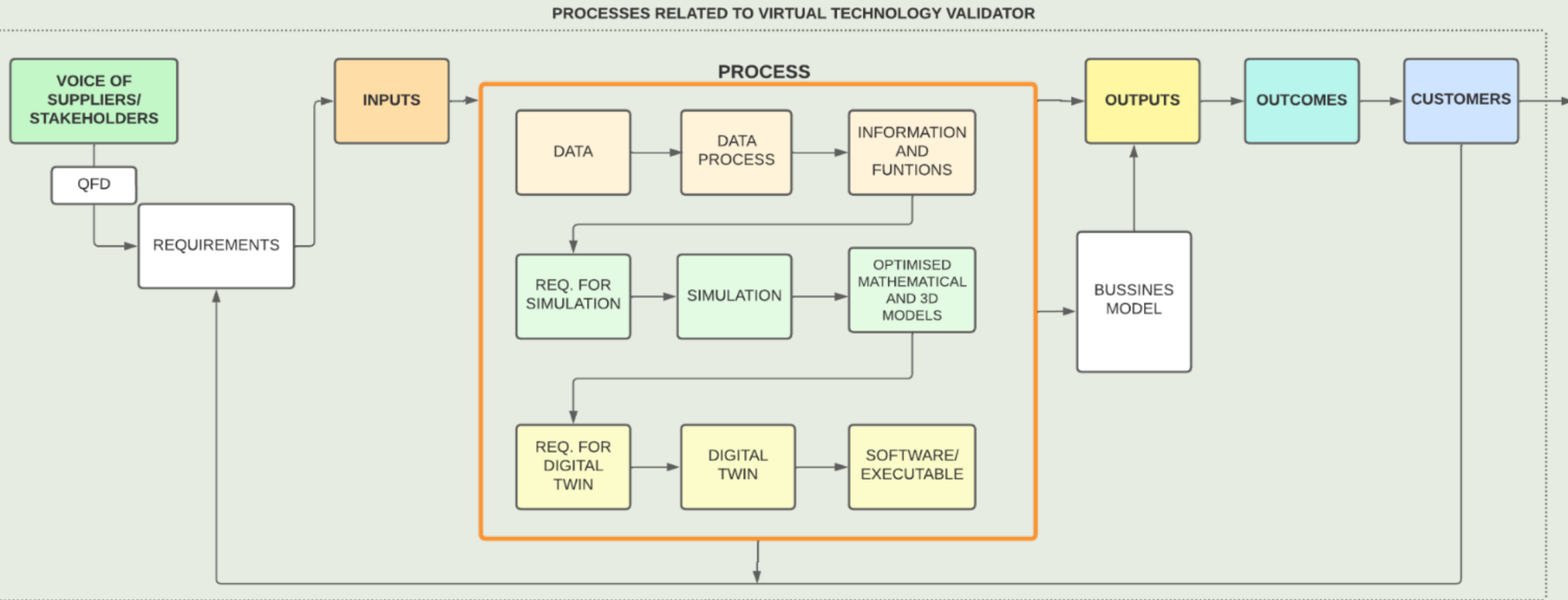
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Virtual reality and Digital Twin: flow chart

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Validation process with diferent stakeholders

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THANK YOU



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