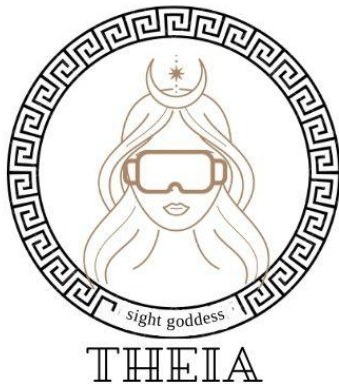


Project in Informatics

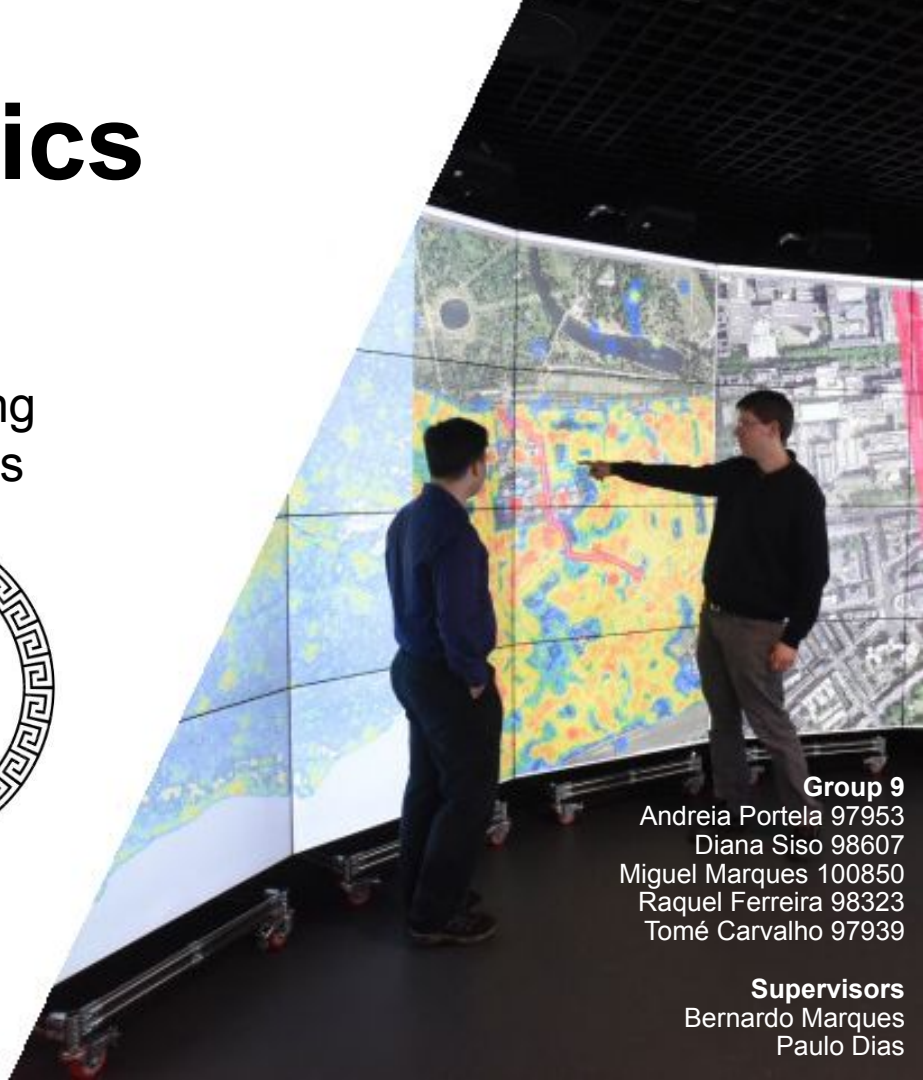
Project 5

Shop Floor Co-located Collaborative Training
using Large Displays & Virtual Environments

Milestone 2:
Lifecycle Architecture



universidade
de aveiro



Group 9

Andreia Portela 97953
Diana Siso 98607
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Supervisors

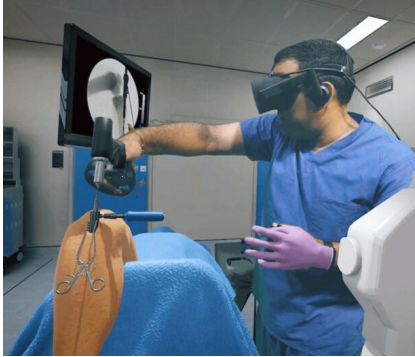
Bernardo Marques
Paulo Dias

Overview/Context

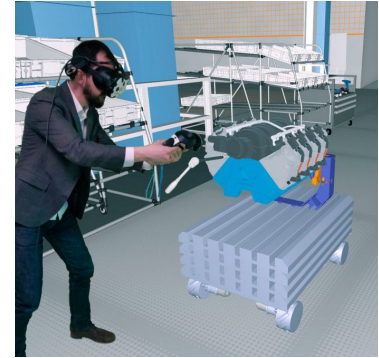
- Given feedback received, just 1 use-case will be used!
- Project theme is inspired by a real-life scenario:
 - Address training procedures in a chain work scenario
- Goals:
 - Provide features for assisting trainers
 - Support trainees learning new procedures
- How?
 - Co-located Collaborative Training
 - Use of Virtual Reality (VR) & Large Displays



State-of-the-art: VR for collaborative training



Some prototypes exist for training.
Most do not support **collaboration**



Actors

Actor	Role
Trainer	Define lists of materials to be used in training sessions. Supervise training sessions and instruct the trainee.
Trainee	Complete training sessions according to the lists created by the trainer, or according to randomly generated lists (adaptation period).

Personas



Bob, 47

Education: Masters in Mechanical Engineering

Job title: Shop floor manager

Time with company: 25 years

Skills: Industry Expert; People management; Excellent Communication

Responsibilities: Improve performance of his team; Mentorship/training of junior workers

Challenges: Improve how learning processes are conducted



Alice, 24

Education: High School

Job title: Industry worker (Trainee)

Time with company: None (new employee)

Skills: Willing to find out more about Industry environments; Curious for trying new technologies

Responsibilities: Develop new skills; Improve communication skills; Start to work unsupervised

Challenges: Learn how to perform new tasks in a timely manner

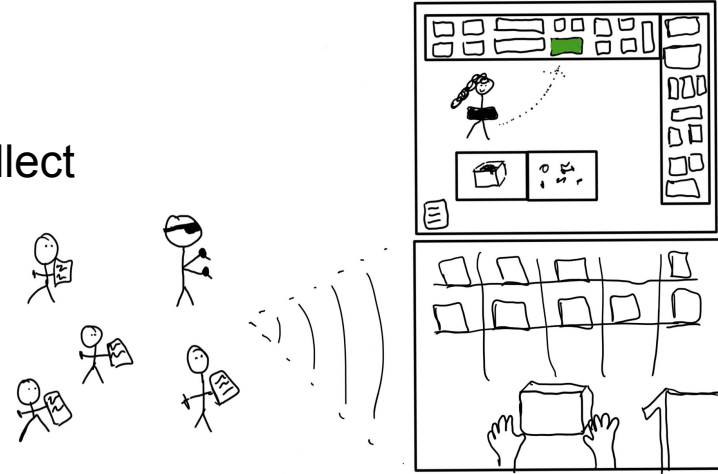
Use Cases

Bob:

- 1) Creates a list of components for the trainee to collect
- 2) Follows the trainee during the VR experience
- 3) Assist/explains necessary steps/errors
- 4) Assigns a score based on trainee performance

Alice:

- 5) Selects an order list and verifies the necessary components she needs to grab
- 6) Moves through the environment while collecting all associated components
- 7) Grabs a box and places all components/documentation inside
- 8) Duck tape package and place it in the 'ready to ship' storage unit



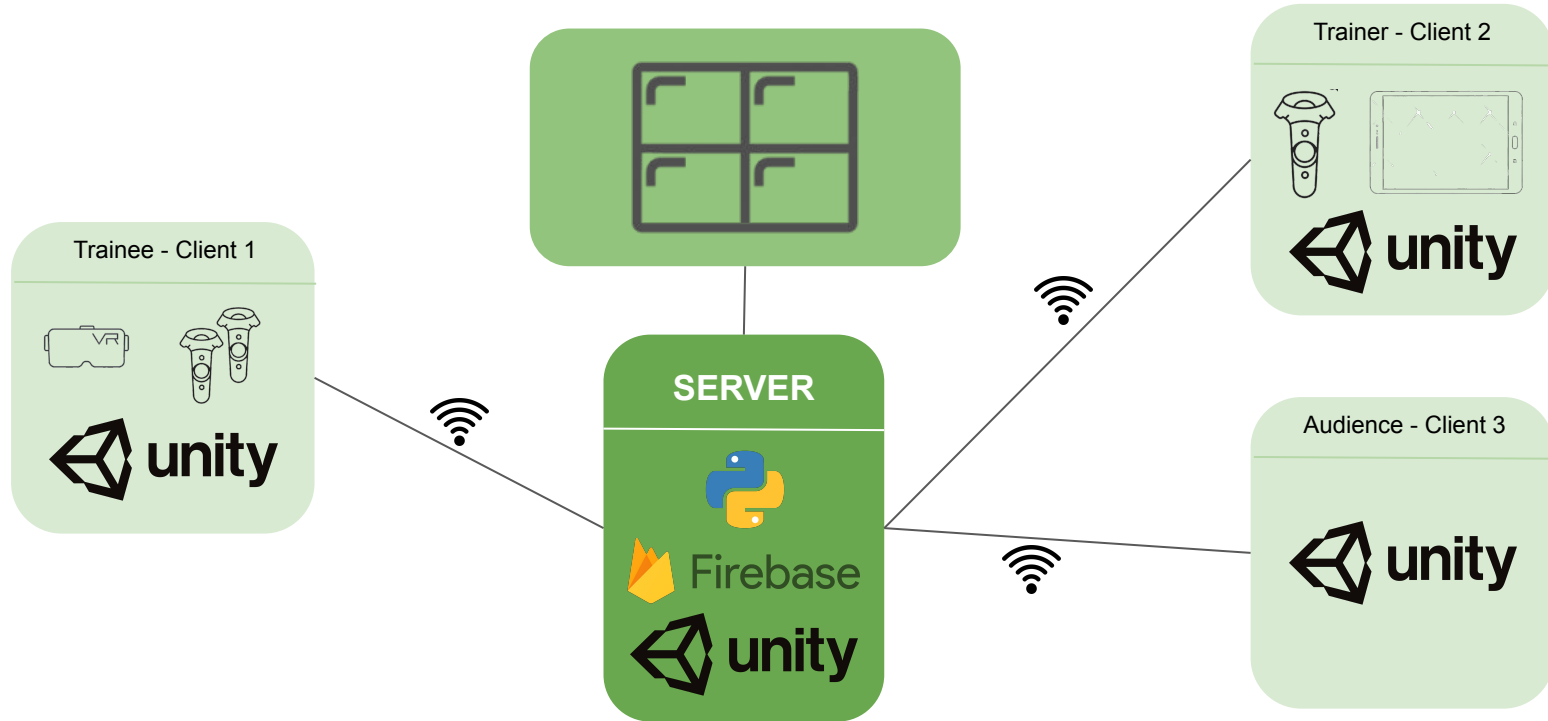
Functional Requirements

Reference	Functional Requirement
FRVRE1	Navigation: move within the VRE
FRVRE2	Manipulation: interact with virtual objects (grab, hold, drop...)
FRVRE3	Receive instructions from the trainer
FRVRE4	Maintain task completion status
FRVRE5	Have feedback procedure
FRTR1	Create list of objectives

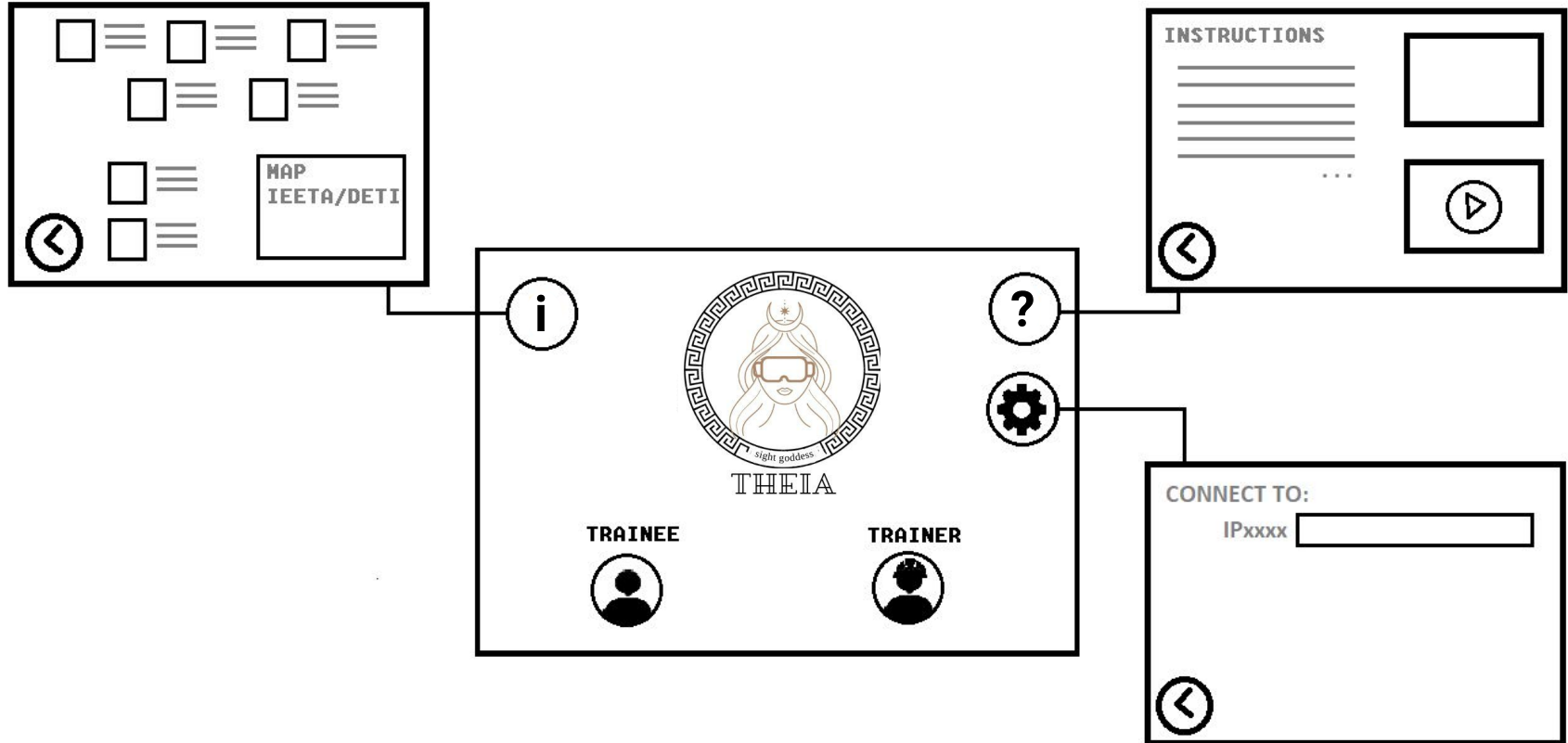
Non-functional Requirements

Reference	Functional Requirement
NFR1	Scalability (increasing number of participants and virtual objects)
NFR2	Compatibility (being adjustable to support changes to the tasks at hands)
NFR3	Synchronicity (ensure content status is shared accordingly)
NFR4	Interaction (allow collaborators to interact through different methods)
NFR5	Portability (being easy to deploy and set-up in new spaces)
NFR6	Usability (ensure interfaces are easy to understand and to use)
NFR7	Performance (avoid system latency and cybersickness)

System Architecture



Mock-ups - Menu



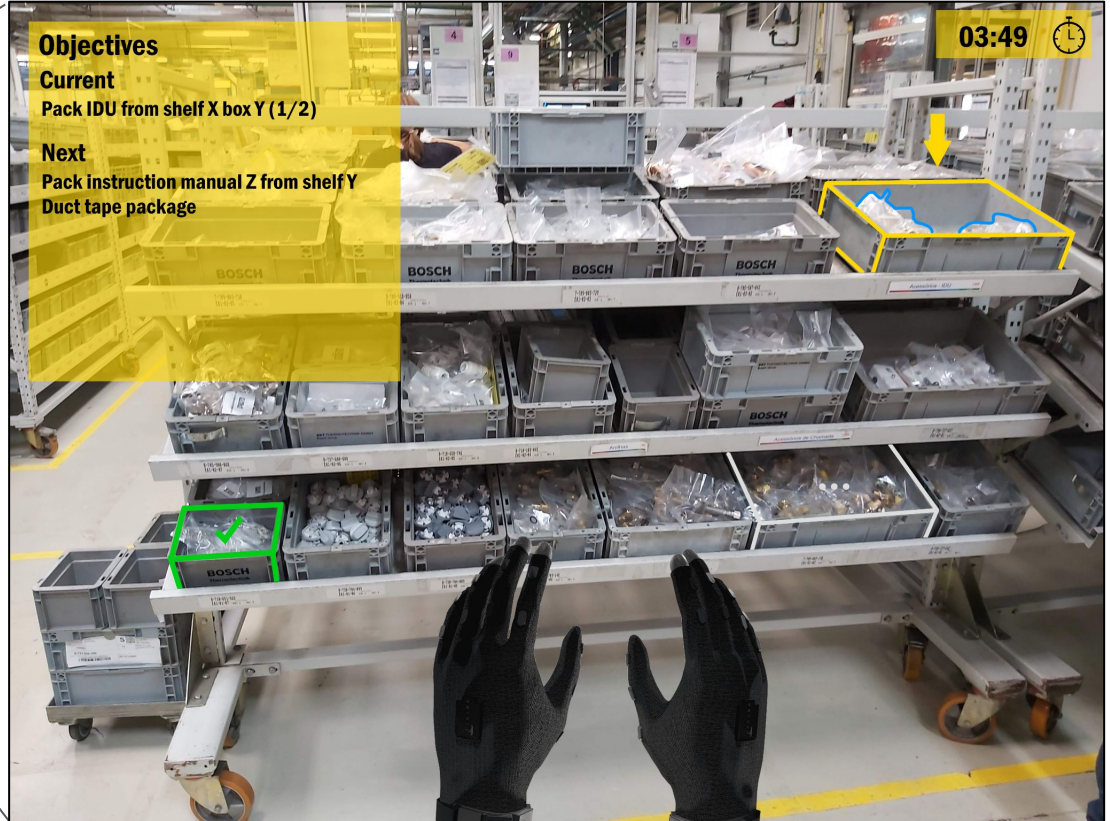
Random List

Defined List

Live List

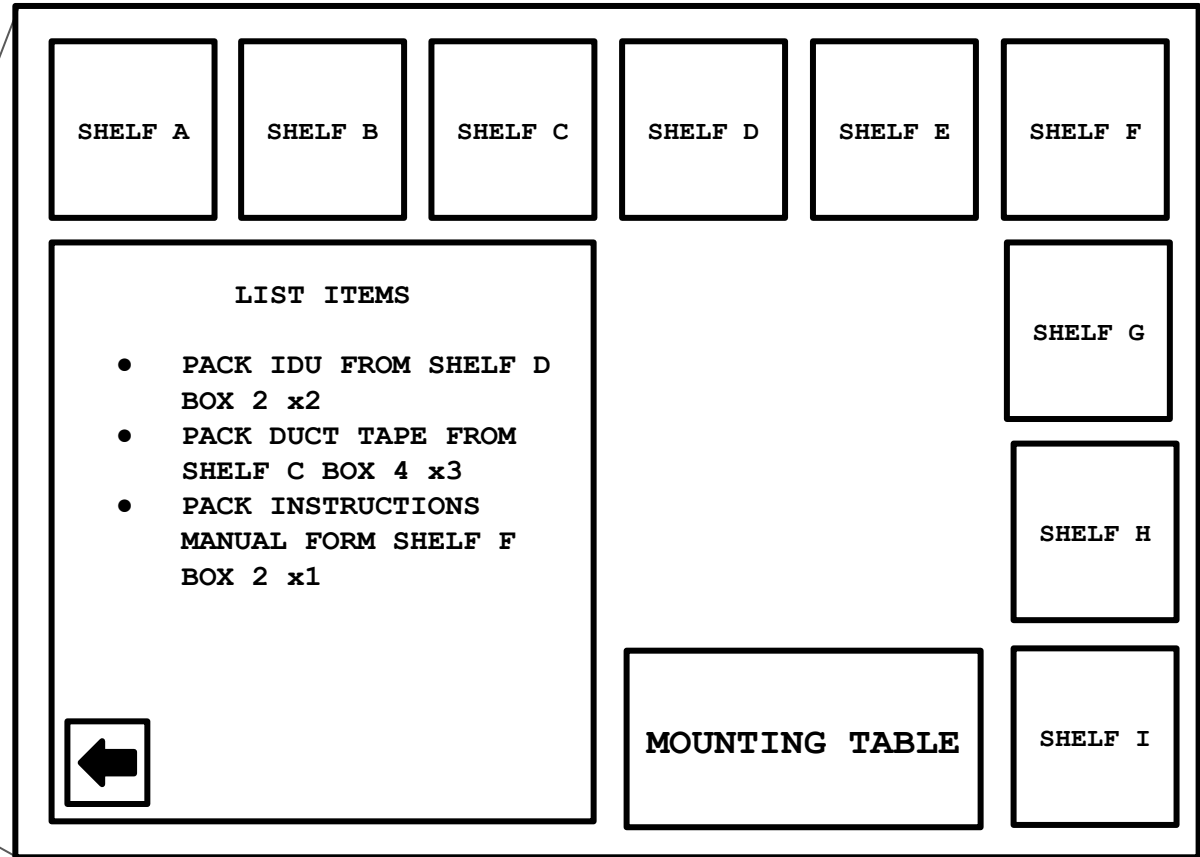


Mock-ups - Trainee (Alice)

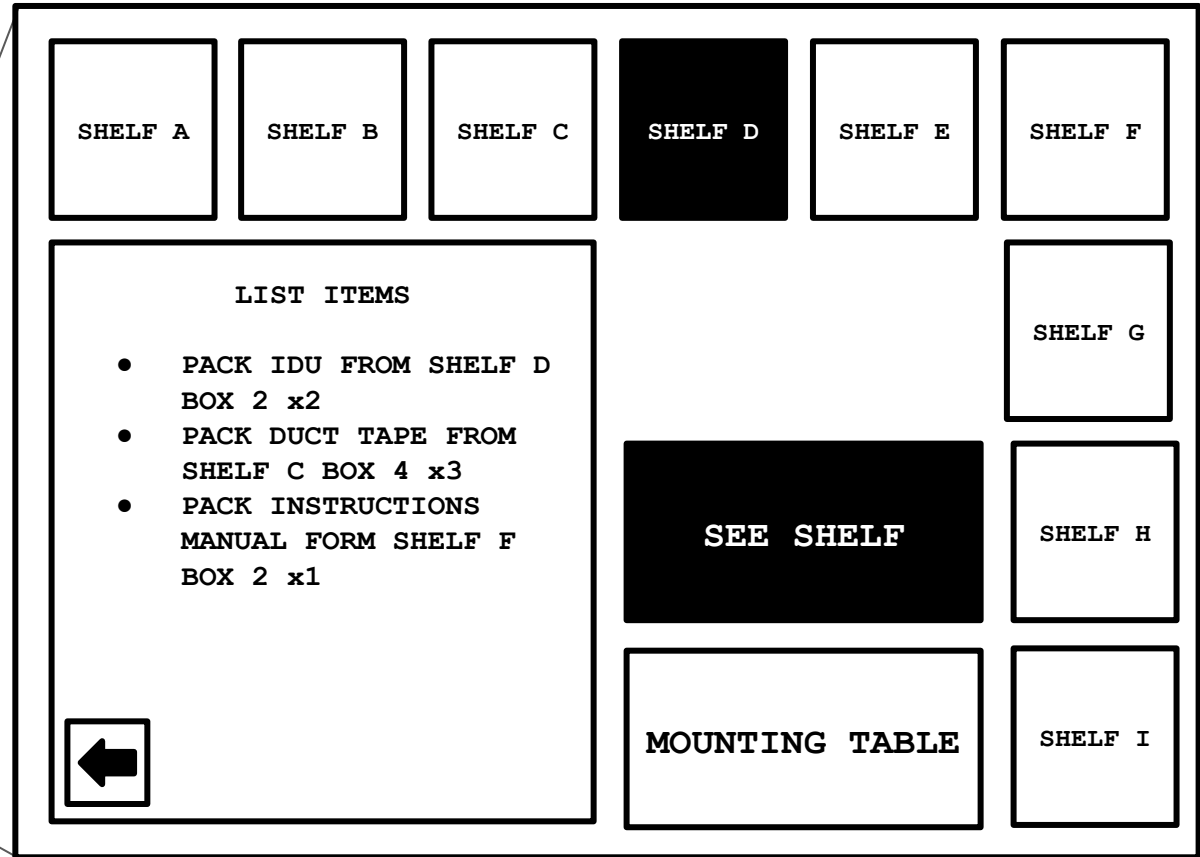


This image shows a blank sheet of white paper with horizontal grey ruling lines. A thick yellow highlighter bar is positioned horizontally across the upper portion of the page, spanning most of its width. The rest of the page is empty except for the continuation of the ruling lines.

Mock-ups - Trainer (Bob)



Mock-ups - Trainer (Bob)



Mock-ups - Trainer (Bob)



LIST ITEMS

- PACK IDU FROM SHELF D
BOX 2 x2
- PACK DUCT TAPE FROM
SHELF C BOX 4 x3
- PACK INSTRUCTIONS
MANUAL FORM SHELF F
BOX 2 x1

SHELF F

BOX 1

BOX 2

BOX 3

BOX 4

GO BACK

Mock-ups - Trainer (Bob)



LIST ITEMS

- PACK IDU FROM SHELF D
BOX 2 x2
- PACK DUCT TAPE FROM
SHELF C BOX 4 x3
- PACK INSTRUCTIONS
MANUAL FORM SHELF F
BOX 2 x1

SHELF F

BOX 1

BOX 2

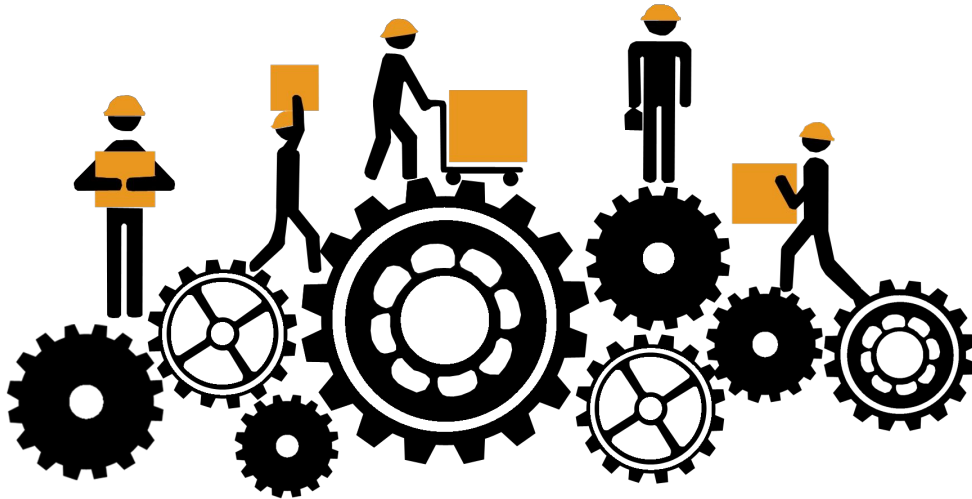
BOX 3

BOX 4

ADD TO LIST

Mock-ups - Final remarks

- Mock-ups for Virtual Environments are a trending research topic
- The proposed mock-ups will be evaluated with domain experts
- Feedback will be used to create the initial prototypes for Milestone 3



Thank you for listening!

