Introduction (10 min)

Welcome, Thanks

Good morning/ afternoon/ evening! Welcome to our user study research. First, thank you very much for your participation. My name is XXX, and this is my colleague XXX.

Today we want to explore how users work with virtual documents in coworking Mixed Reality offices. The whole process will be video and audio recorded, and the data will be used only for academic purposes.

In short, there are FOUR steps in today's study, which will take roughly about 120 min.

1. Initialization - Consent and pre-study questionnaire (10 min)
2. Priming - Paper Arrangement (50 min)
3. Production - Holographic Documents in MR (60 min)
4. Closing - Post-study interview (10 min)

Please start reading and signing the Declaration of Consent if you agree.

Then please fill out this Pre-study Questionnaire, which includes questions regarding your demographic information and experience.

Please always feel free to ask if you have any questions.

During Sign Consent:
- HoloLens Measurement/ Recording
- Other Measurements
  - Reality video & audio recordings (iPhone + iPad + Camera)
  - Observation notes, especially the keyframes/ moments of strategies
  - Photo of physical document organization results

Pre-study Questionnaire: demographics, content organization experience, device experience

Priming - Paper Arrangement (50 min)

Introduction (5 min)

You can find yourself in a typical office, where you can see 25 pieces of documents about animals. Your task is to arrange these cards for a presentation at an exhibition.

There are no specifications on which criteria or strategies you should use to arrange these cards - you can decide this freely. You can use the text-based information on the cards as well as the visual information of the images.

The task is finished when you have finalized the arrangement or after 10 minutes. You will get time reminders twice in between. In the end, you need to demonstrate your presentation.

A few more notes before you start,
- Feel free to create any categories, even with only a few cards.
- The aim is that the resulting documents are organized, meaningful, and interesting for the presentation.
- Please think aloud while arranging content - Speak out what you are thinking!
- We also provide clippers for more flexible placement and post-its for adding additional notes, if you want.
- Lastly, the whole room (until this line) and the furniture in the room are available to you for this task; feel free to use or move them if you need to.

Any questions? Please start now.

First Arrangement (10 min)

Second Arrangement (10 min)

Your colleague just found another 25 cards as 5 stacks, spreading over the office. Please integrate these 25 cards into your current presentation. You will have another 10 minutes to finish your presentation. We will remind you about the time left.

Paper Arrangement - Presentation (5 min)

While the experimenter is taking pictures to archive your work, please present us shortly:
- [Classifications] What classifications do you have?
- [Workflow] How did you prepare your presentation?

Priming - Paper Arrangement (50 min)

Organization Action Revisit (10 min)

Thank you for your presentation! During your task, we noticed some interesting behaviors and actions. We would like you to demonstrate to us again how you exactly worked with documents during the task with these document samples.

Please feel free to make some space and then show me how…

Item manipulation
1. You aggregate several items into a group
2. You add one item to the group
3. You remove one item from the group
4. You move one item from this group to another group

Group manipulation
5. You move a group to another place
6. You merge two groups into one group
7. You split a group into two sub-groups

Preview
8. You preview the group and familiarize yourself with the [diet/ social/ character] aspect (extract specific information)

Overview
9. You overview and elaborate on the [similarities/ differences] of the group (extract information without predefined targets)

Search
10. You search Item A from the whole office environment
11. You search Item B from Group X

Sort
12. You sort this group based on an order [size]

Temporal storage space
13. You use a place to store documents before moving to the final arrangement

Annotate
14. You annotate documents and add some remarks

Priming - Paper Arrangement (50 min)

Device priming (5 min)

Thank you for the demonstration. Let's transition from paper documents to the future.

We will show you some videos of the future of mixed-reality technology envisioned by sci-fi movies. Thanks to the technical developments, some have been realized. Please pay attention to their functions, features, and capabilities in the video clips. But most importantly, imagine other possibilities achieved in the next 10 to 15 years.
- Avatar - Unobtanium under Tree
- Ready Player One - Ready Player One UI
- Iron Man - Iron Man 2 Interfaces

Environment priming (5 min)

Now, let me guide you through your office space in more detail, focusing on the specific objects within it. I will mention the names of various items, and as I do, please point to each corresponding object when you hear its name.
- Vertical surfaces
  - Big vertical whiteboard on the wall
  - Moveable small whiteboard
  - Digital whiteboard - Microsoft surface hub
  - Small desktop with a Microsoft Studio PC
- Horizontal surfaces
  - Big size table
  - A single-person table
- Moveable objects
  - Three desk chairs
  - Two coffee mugs
  - Three books
  - Two folder
- Static objects
  - A cabinet
  - Two plants
  - A printer

Production - Holo-Documents in MR (60 min)

Free exploration (5 min)

You are now entering an MR office, where numerous documents (110 animal cards) are spread throughout the environment. Someone has already been working with these documents and has arranged many of them in the MR space, similar to what you did in the previous step.

However, the arrangement is only partially completed, as some documents remain unorganized. Please take a moment to look around and familiarize yourself with the current state of the arrangement, focusing on the positions, layout, and content.

Participatory design (55 min)

- Production - force as many ideas as possible with "Do you have any other ideas?"
- Encourage participants all the time!
- Provide some conditions [far / close to documents] to inspire, if necessary

Now, it's time for you to continue this work. However, before you can interact with the documents, we need to explore how to do so. For that, we invite you to imagine a future world in 2040. Like before, we will list some actions, but this time, your task is to envision and demonstrate how you would manage these actions. Feel free to use any means to describe possible interactions—whether it's through speech, body movements, or sketches.

Once again, there are no boundaries when it comes to imagining the future. Picture a mixed-reality office in 2040, unleash your creativity, and don't hesitate to be bold and daring in your ideas!

Production - Holo-Documents in MR (60 min)

Please show me ... Do you have any other ideas?

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Post-study semi-structured interview (10 min)

Post-study interview: general impression, media difference, challenges, future visions

Sign the compensation document, Thank you, Conclude