

A User-Centered Cabin Design Approach to Investigate Peoples Preferences on the Interior Design of Future Air Taxis

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Knowledge for Tomorrow



Introduction

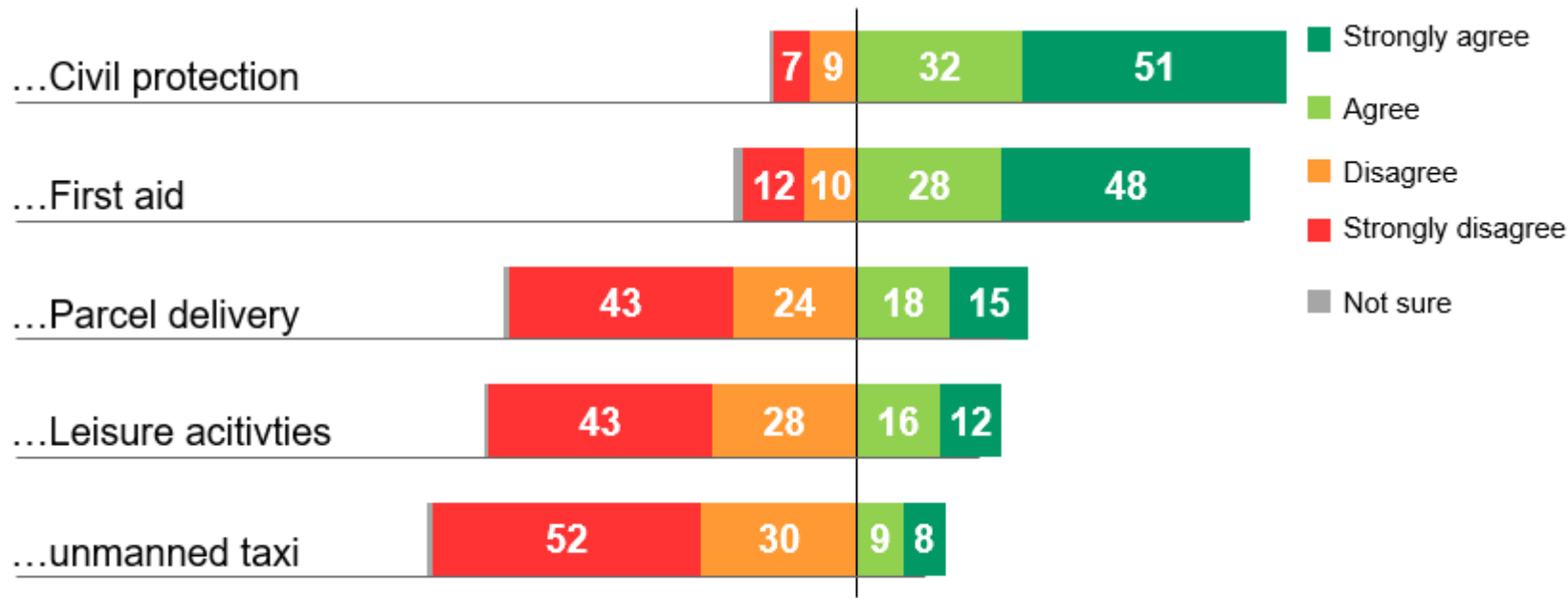
- Project HorizonUAM: combines the research into Urban Air Mobility (UAM) vehicles, the corresponding infrastructure, the operation of UAM services, as well as the public acceptance
- Customer plays a crucial part in the development process
- Design Thinking Method
- Focus group research



Fig. 1: Project image of HorizonUAM

Background

- Conceivable own use of civil drones ...



Percentage values

Fig. 2: Results of a DLR survey in 2018



Background

- 84 percent of respondents would acknowledge an offering of Volocopter air taxis (Planing & Pinar, 2019)
- Essential comfort aspects in aircraft cabins: legroom, temperature, noise, entertainment, seats, hygiene (Ahmadpour et al., 2014; Vink et al., 2012)
- The factors seating space, noise and safety more important to 41-50-year-olds than to younger (Hankovská, 2018)
- Elderly people particular tolerant to thermal sensation, but more sensitive with regards to acoustic comfort (Indraganti & Rao, 2010)



Our study pays attention to the age and residential location of people and their preferences on the cabin design of air taxis



Method

Sample

- 16 participants
- 11 male, 5 female
- Recruited via internet

Procedure

- Online focus groups in 2020
- General vehicle and cabin preferences
- preferences on air taxi cabins > Disney Method

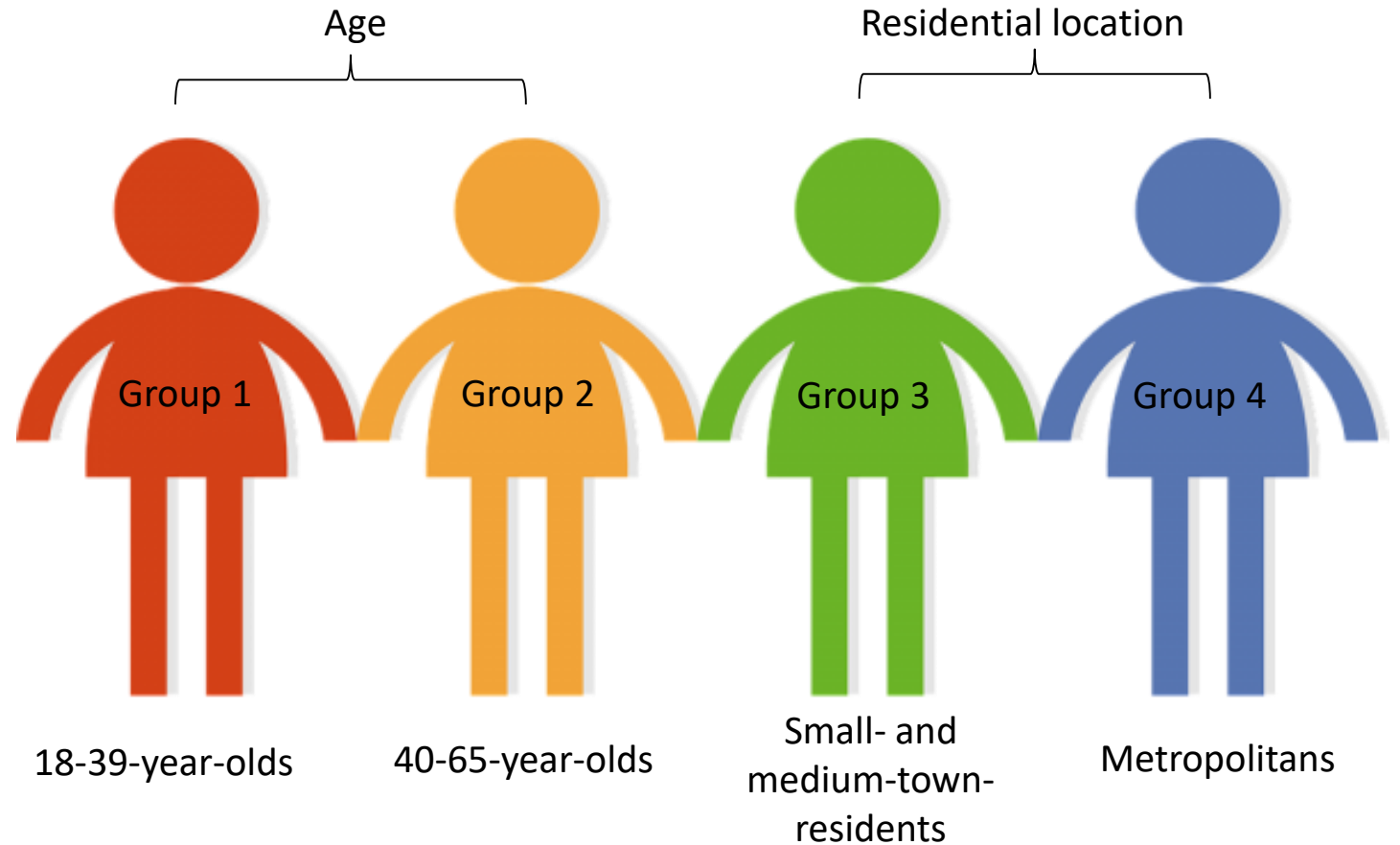


Fig. 3: Participating groups of the survey



Disney Method

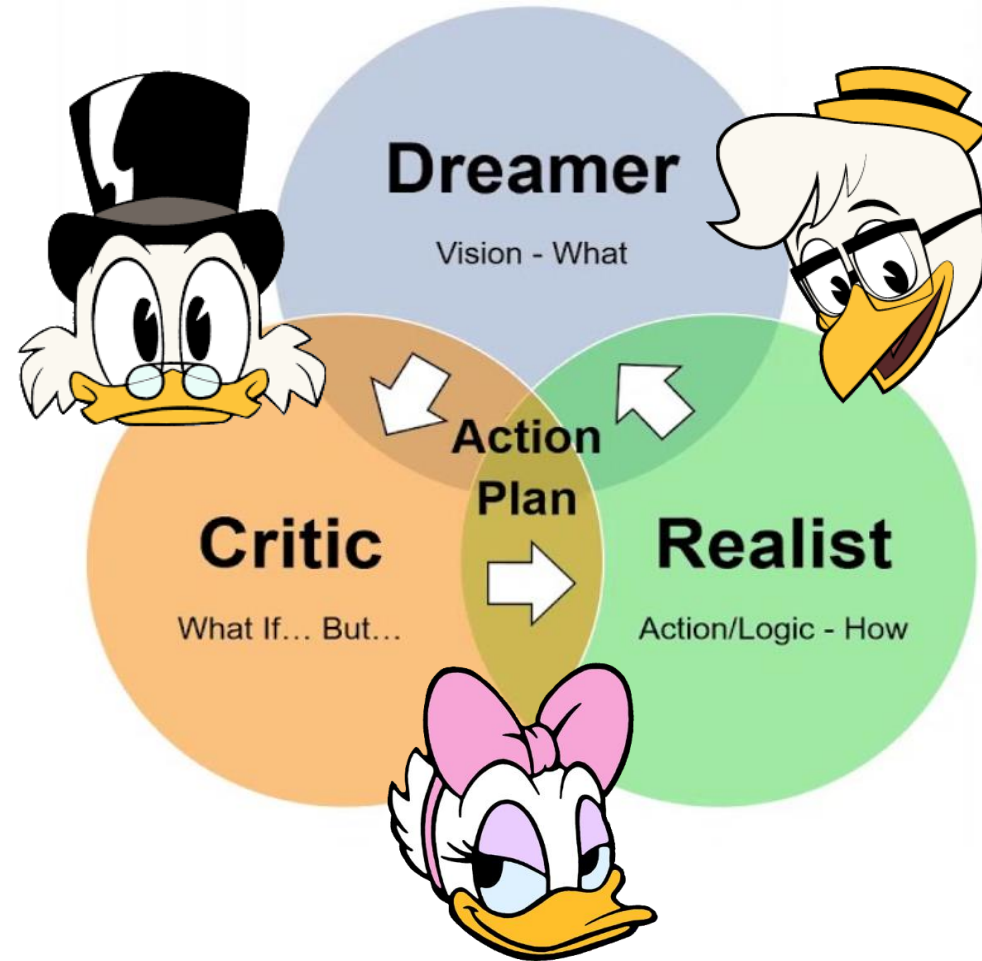


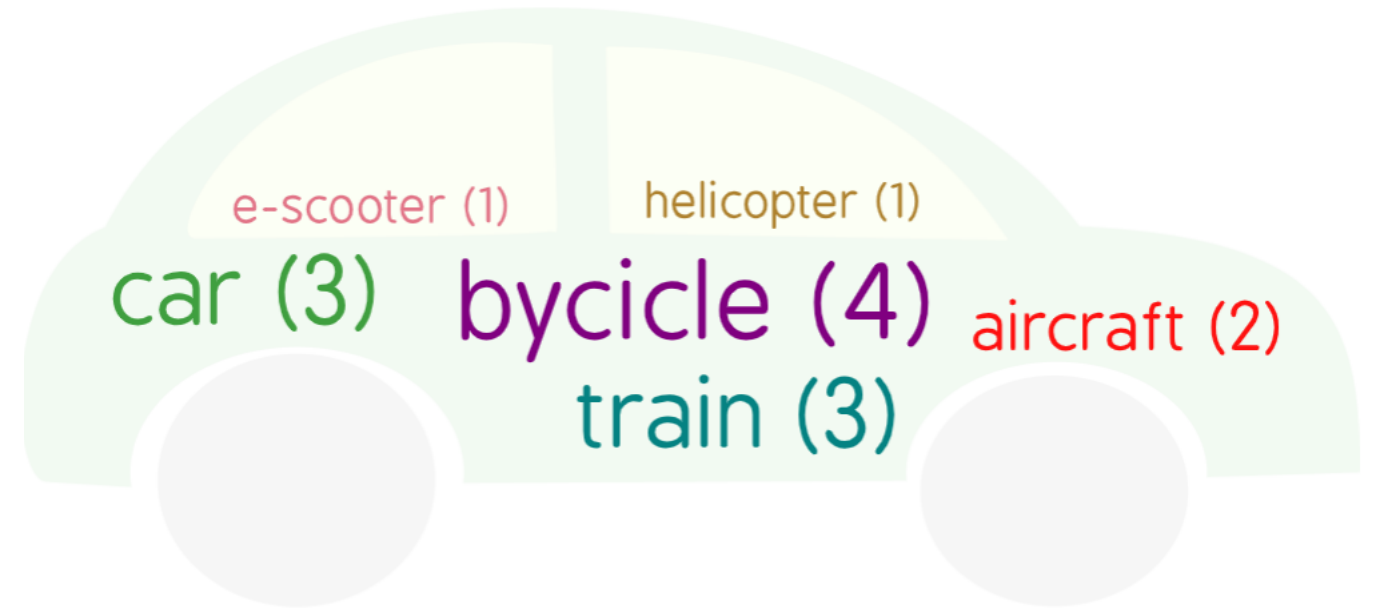
Fig. 4: Visualization of the Disney Method (<https://i.ytimg.com/vi/FyOBk0filqs/maxresdefault.jpg>)



Results

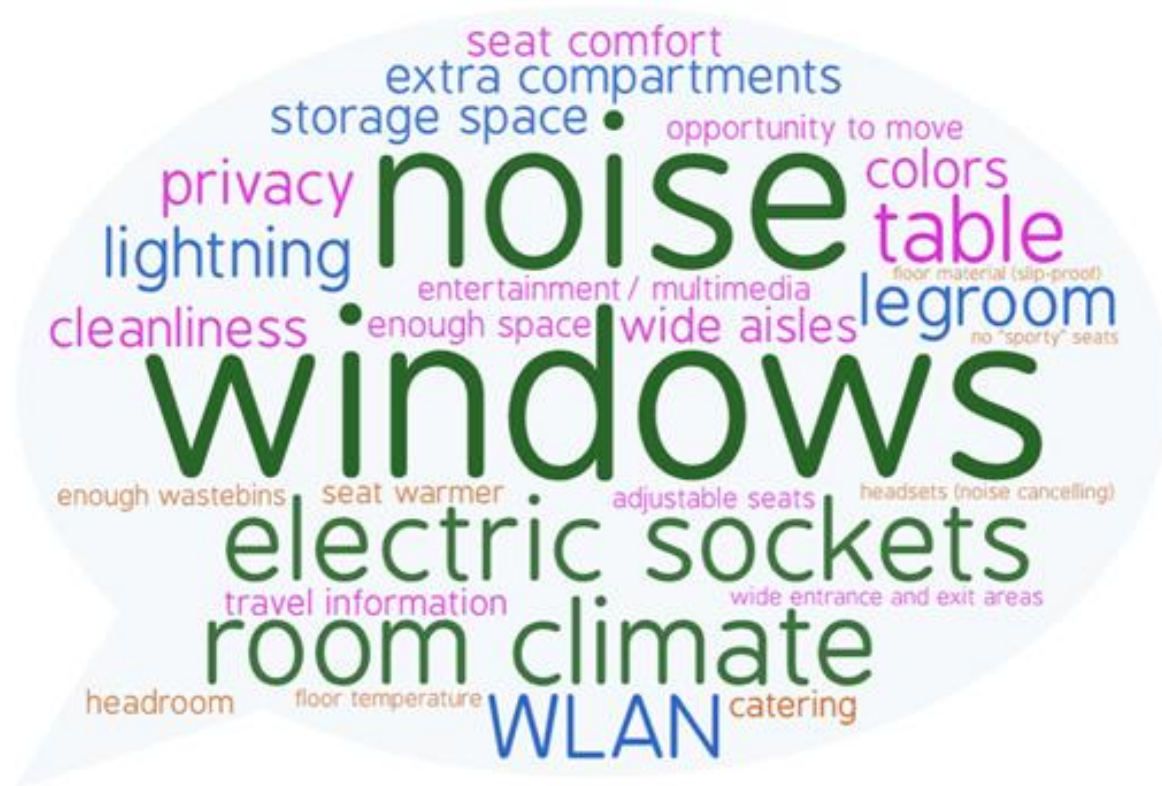
Vehicle preferences

- Flexibility
- Avoid traffic jams
- No searching for parking spaces
- Safety
- eco-friendliness
- Short travel times
- Punctuality
- Spend time in a useful way



Results

Vehicle cabin preferences



Legend:

- Green = very important (4 groups)
- Blue = important (3 groups)
- Purple = moderately important (2 groups)
- Orange = slightly important (1 group)



Results

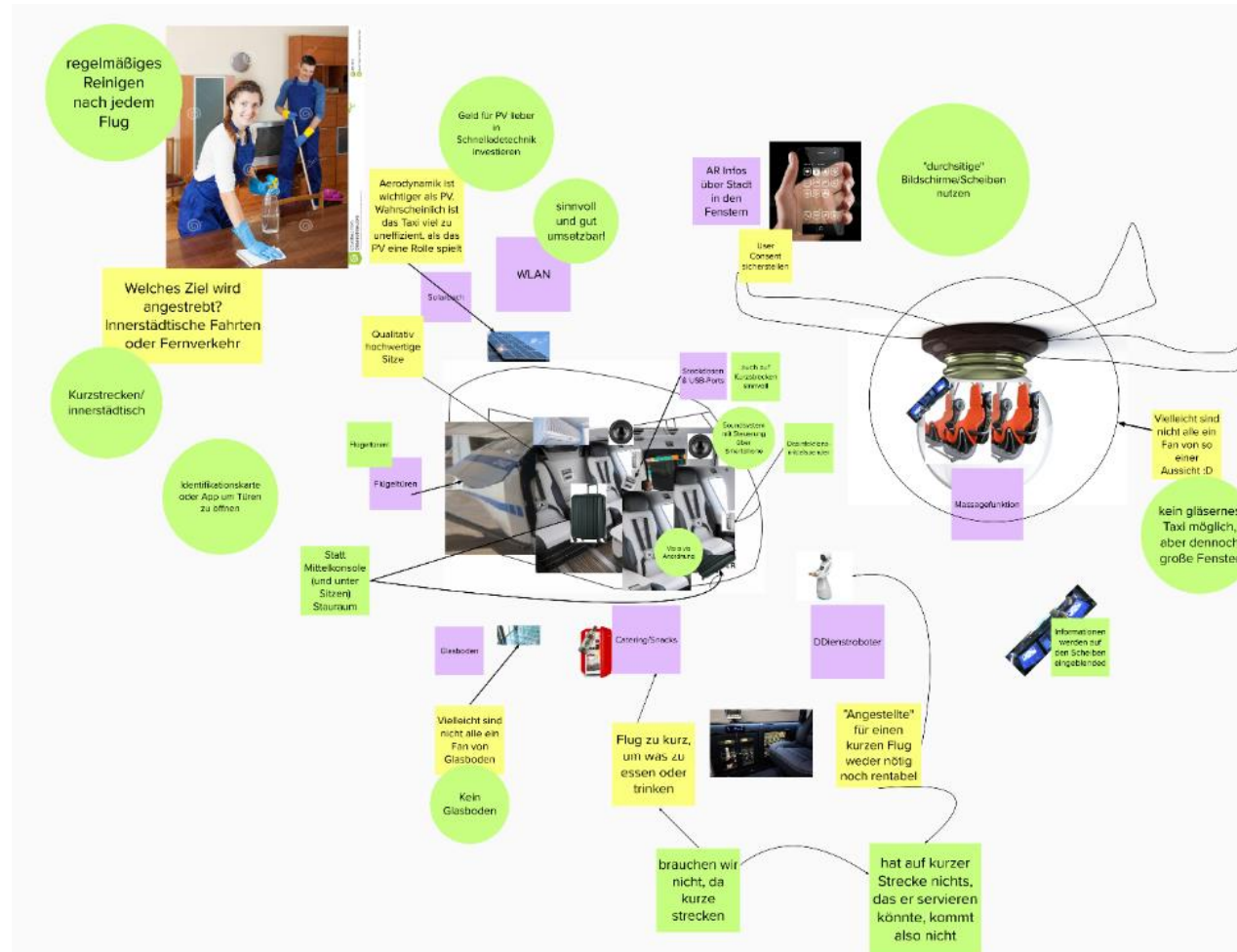


Fig. 5: Air taxi cabin design concept of the group of the 18-39-year-olds



Results

18-39-year-olds

High-quality seats

Service robot

Folding doors

Solar roof

AR-technologies



40-65-year-olds

Enough storage space

Legroom

Bright ceiling

Convertible seats

Noise reduction

Dark seats

AR-technologies



Results

Small- and medium-town residents

Large enough for families

Comfort

Bycicle stand

Entertainment (for kids)



Inclusiveness

Storage space

Separate entrances



Metropolitans

AR-technologies

Entertainment



High-quality seats

Convertible seats



individual

Modular seating

Snacks



Summary

Vehicle preferences

- Bicycle favorite means of transport > air taxis combinable with bicycles
- concept of air taxis has the potential to meet key travel demands (e.g. fast, flexible)

Vehicle Cabin preferences

- Similar findings as in Ahmadpours study (e.g. noise, room temperature, legroom)
- Further findings: lightning, storage space, windows, barrier-free entries



Summary

Preferences on air taxi cabins

- Similarities: separate compartments, hygiene, barrier-free, emergency button, large windows for panoramic view
- 18-39-year-olds: modern and futuristic technologies, eco-friendly
- 40-65-year-olds: modular set-up, multifunctional
- Small- and medium-town residents: inclusiveness, comfort, privacy
- Metropolitans: individuality



Conclusion

- There are central requirements significant to most participants, but also different priorities in the individual groups
- Future air taxi cabin design concepts should consider the most common and crucial demands
- Also address specific requests of certain user groups
- Further research should identify most relevant user groups of air taxis
- Include key customers in the development and design process



References

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Thank you for your attention!

