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Water and Sanitation in Developing Countries

How (not) to design and construct UDDTs – a comprehensive guide to functionality

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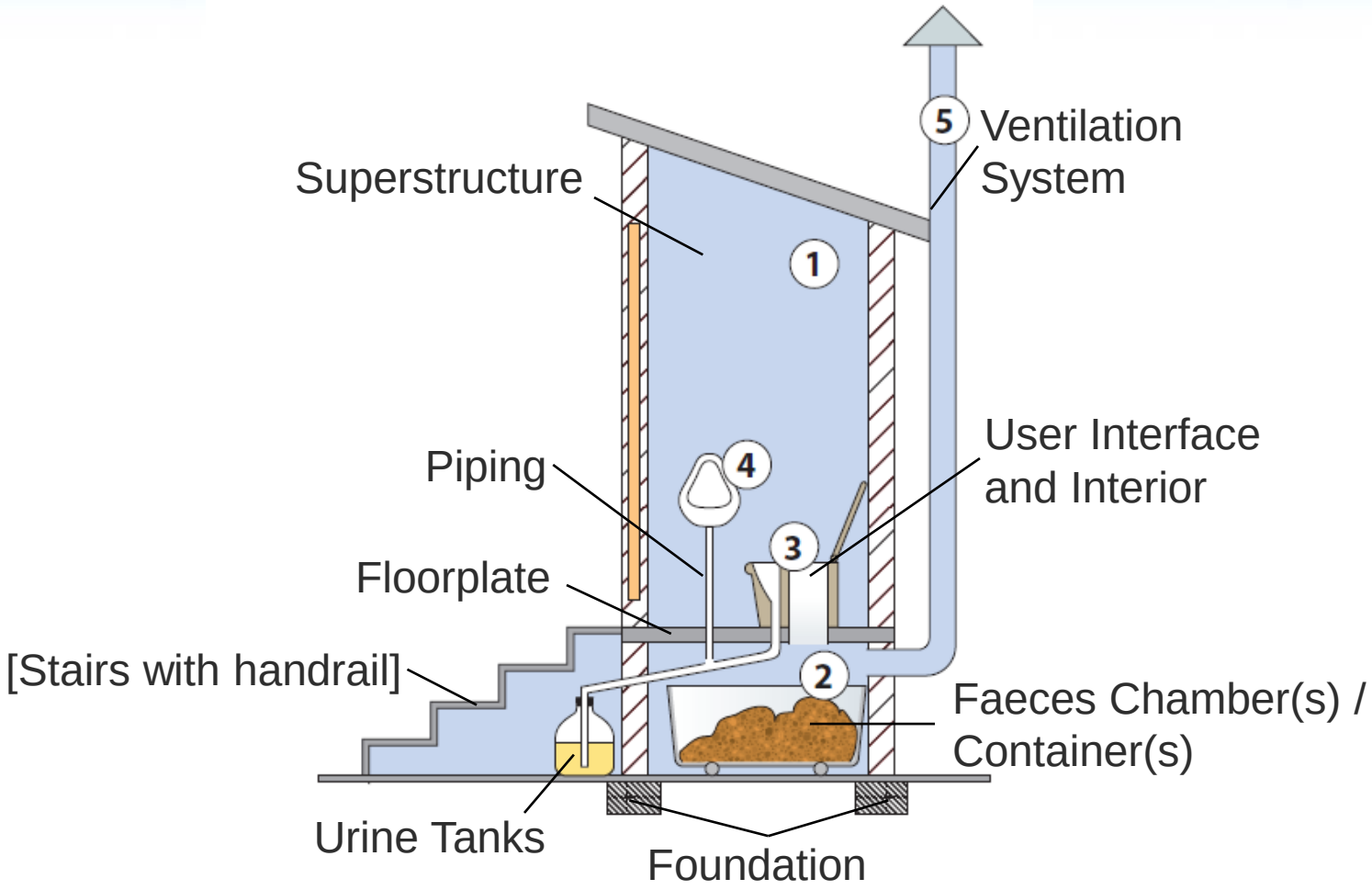
4th International Dry Toilet Conference, 22-25 August 2012, University of Tampere, Finland

Components of a UDDT

Figure: adapted from [10]



+ Handwashing Facility
+ User Information Posters
+ Anal cleansing / handwashing water infiltration

What do users like or dislike about UDDTs?

Like

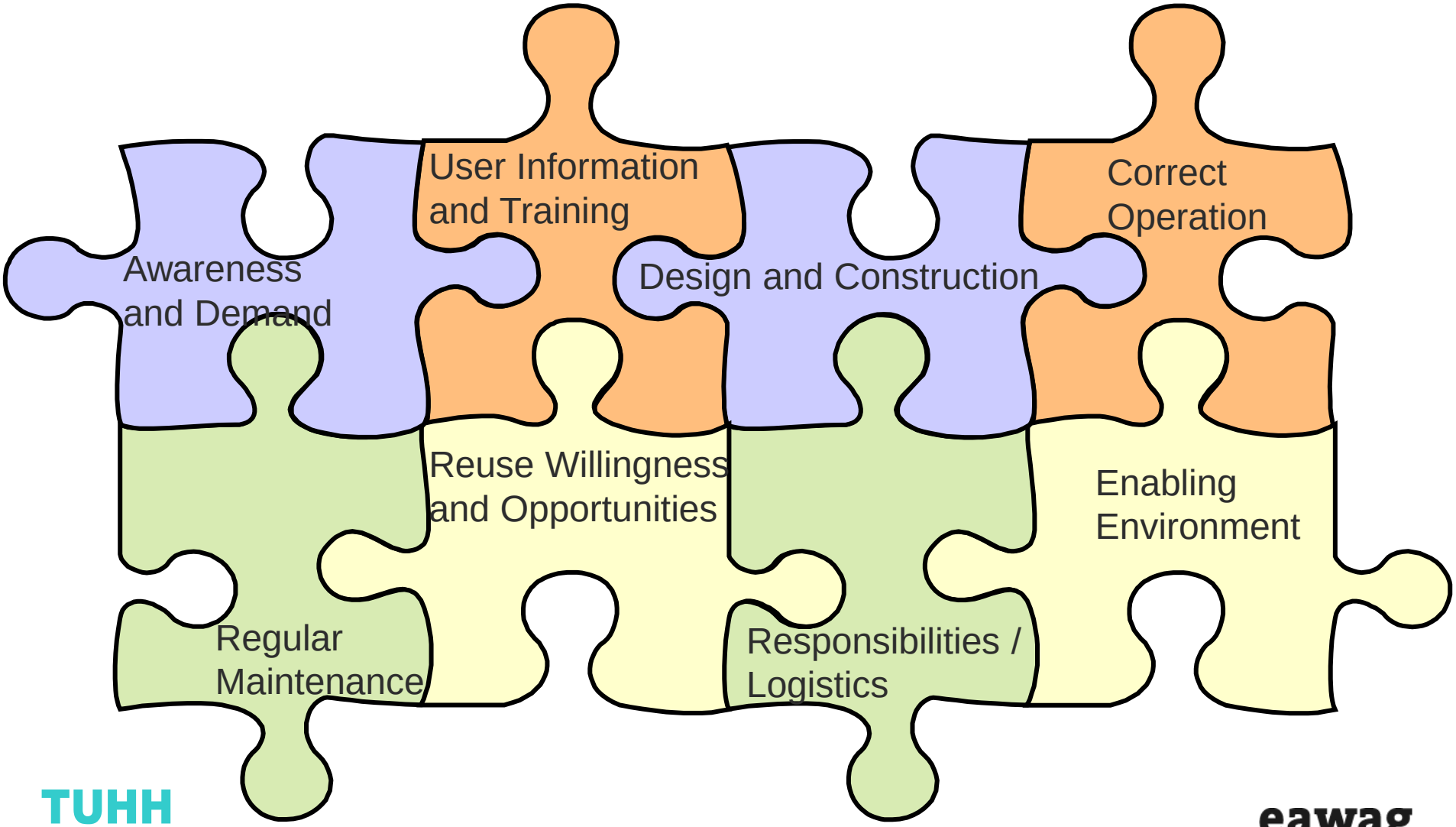
- «completely smell- and fly-free»
- «comfortable»
- «easy to use»
- «simple»
- «nice and clean room»
- «useful products for agriculture»
- «no pit digging needed»
- «products relatively easy to remove and to handle»
- «long storage and hygienization period»
- «no contamination of groundwater»
- «very little maintenance»
- «no water needed»
- …

Dislike

- «bad odours, annoying flies»
- «not modern, I prefer flush toilet»
- «difficult to use, often misused»
- «difficult to access»
- «difficult to (keep) clean»
- «don't need/want to use products for agriculture»
- «difficult to empty»
- «too frequent emptying and handling of excreta»
- «too expensive»
- «clogging/ broken down elements»
- «strong air flow through the toilet»
- …

Success factors for UDDTs

What has to be considered when implementing them?



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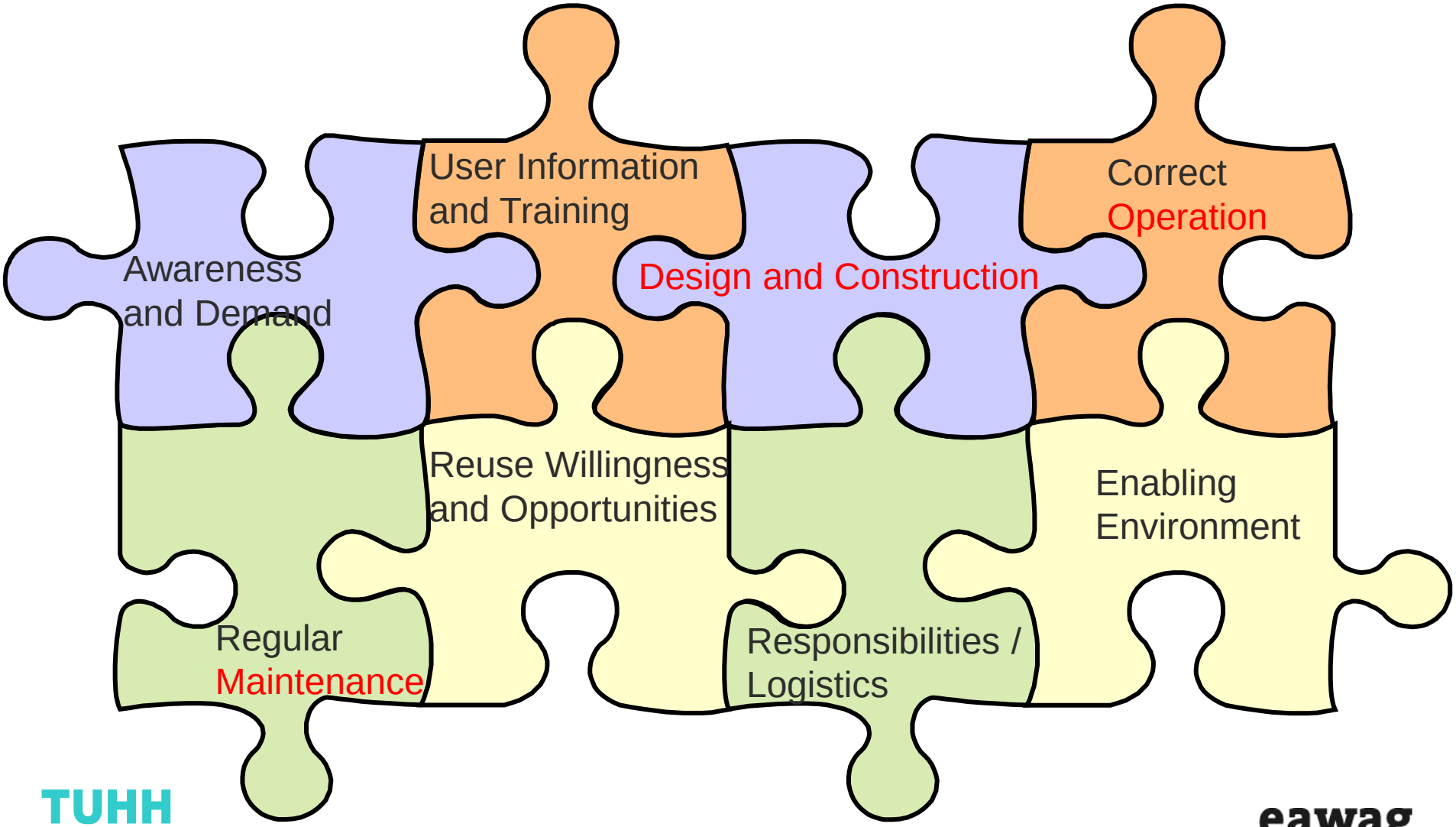

What do users like or dislike about UDDTs?

Linked to Design and Construction
Partly linked to D&C

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Acceptance dependent on user-friendliness and functionality!

What can go wrong?

Possible Design and Construction Related Reasons for Failure of UDDTs (Examples)

Bad piping

Photo: S. Blume, GIZ (2009)

Non-intuitive design

Poor ventilation design

Wrong placing and dimensioning

Door interfering with slab

Interior layout

Low-quality materials

Preferences and needs not considered

Surfaces difficult to keep clean

Construction quality and supervision

Lacking hand-washing facility

Why do/did such mistakes happen?

- Lacking user involvement
- Low-cost focus
- Numerous good manuals and guidelines exist, e.g.…

Source: [1]-[10]

… BUT: not detailed enough to prevent errors!

- Trainings not thorough and comprehensive enough
- Engineers unaware of / underestimating important details and their implications
- Insufficient supervision during construction

Need for a comprehensive manual on UDDTs which highlights critical issues and provides dos and don'ts

Approach

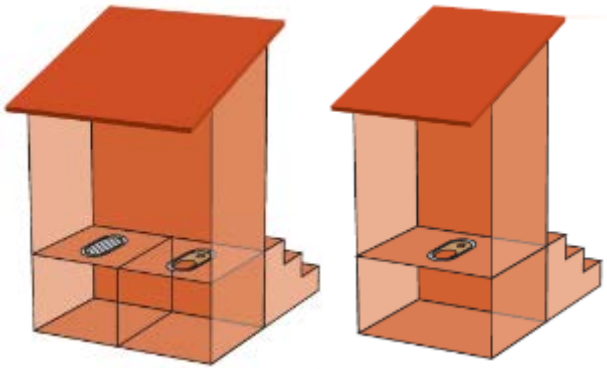
Generic Manual with Checklist of Dos and Don’ts

Preliminary design questions

Figure source: [11]

To be answered with user involvement

- What is the local context (physical and environmental, socio-cultural, legal, institutional, financial parameters)?
- Who will use it (age, sex, number of users)?
- What are the users' needs and preferences?
  - Special needs
  - Siting
  - Ground-level vs stair access
  - Double-vault vs single-vault
  - Urine tank dimensions
  - Sitting vs squatting
  - Washing vs wiping
  - Urinal
  - Shower
  - Cost ceiling
  - Interior dimensions and layout
  - Materials
  - Responsibilities for operation and maintenance
  - Use or disposal of urine and faeces



Detailed Design and Implementation

Suggested procedure

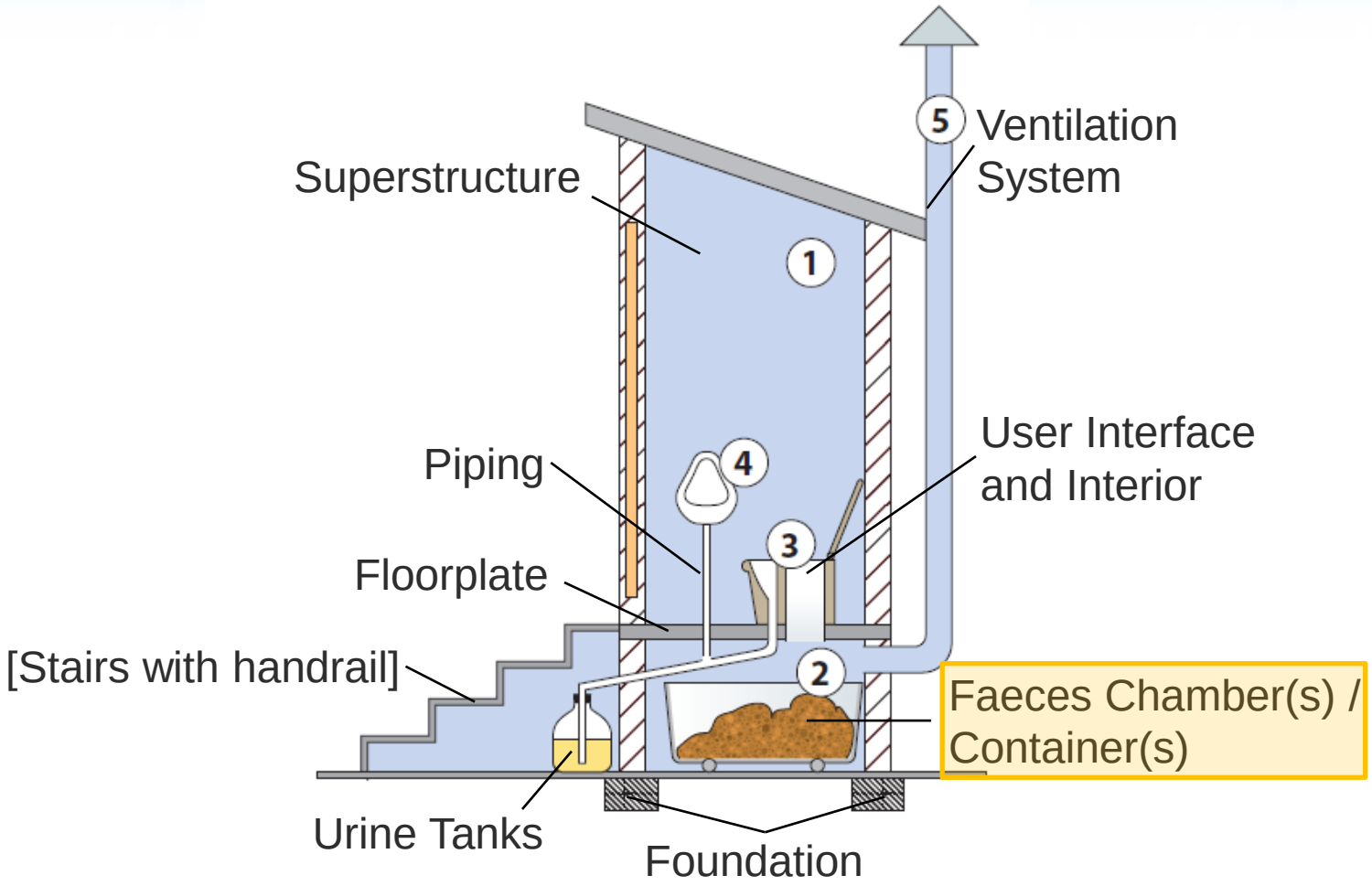
- Determine dimensions
- Check material availability, prices and quality
- Take remaining design decisions (e.g. active or passive ventilation system, prefab or self-made UD seat?)
- Select materials
- Prepare technical drawings
- Calculate bills of quantities
- Procure materials
- Identify human resources (experience, skills and training needs?)
- Start implementation, ensure supervision and quality control

Cross-cutting tasks:

- Validate decisions with users where needed
- Follow checklist of dos and don’ts for each component to avoid mistakes

Components of a UDDT

Figure: adapted from [10]



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Dos und Don’ts according to components

Example: Faeces Chamber Doors

Photo: S. Tapsoba (2009)

Function:

- Access for inspection, maintenance and emptying

Requirements

- Accessible for pipeworks
- Easy emptying of chambers
- Airtight construction
- Water-resistant
- Corrosion-resistant
- Rodent-proof
- In certain cases: Insulation

Photo: S. Blume, GIZ (2009)

Dos und Don’ts according to components

Example: Faeces Chamber Doors

Alternatives:

Doors with hinges

Sliding doors

Closed with bricks and mortar

Recommendations

Do…

- Place doors in line with bottom of faeces chambers
- Use rubber sealings (e.g. bicycle tyres)

Do not…

- Go below 60 x 60 cm with the dimensions (for double-vault toilets)
- Use untreated wood (not airtight, termites etc.)

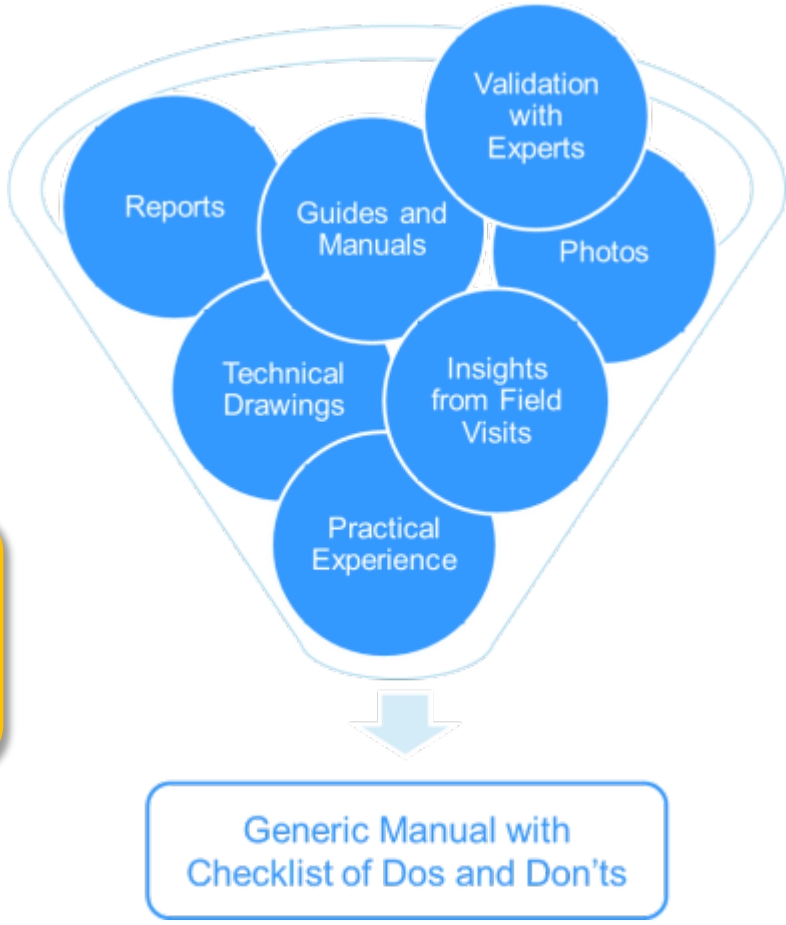
Outlook

Next steps:

- Draft of detailed guide based on synthesis of worldwide experience
- Review by other experts and practitioners
- Publication in 2013

Any practical experiences to share?

Your contribution is appreciated!



Thank you for your Attention!

Kiitos paljon!

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