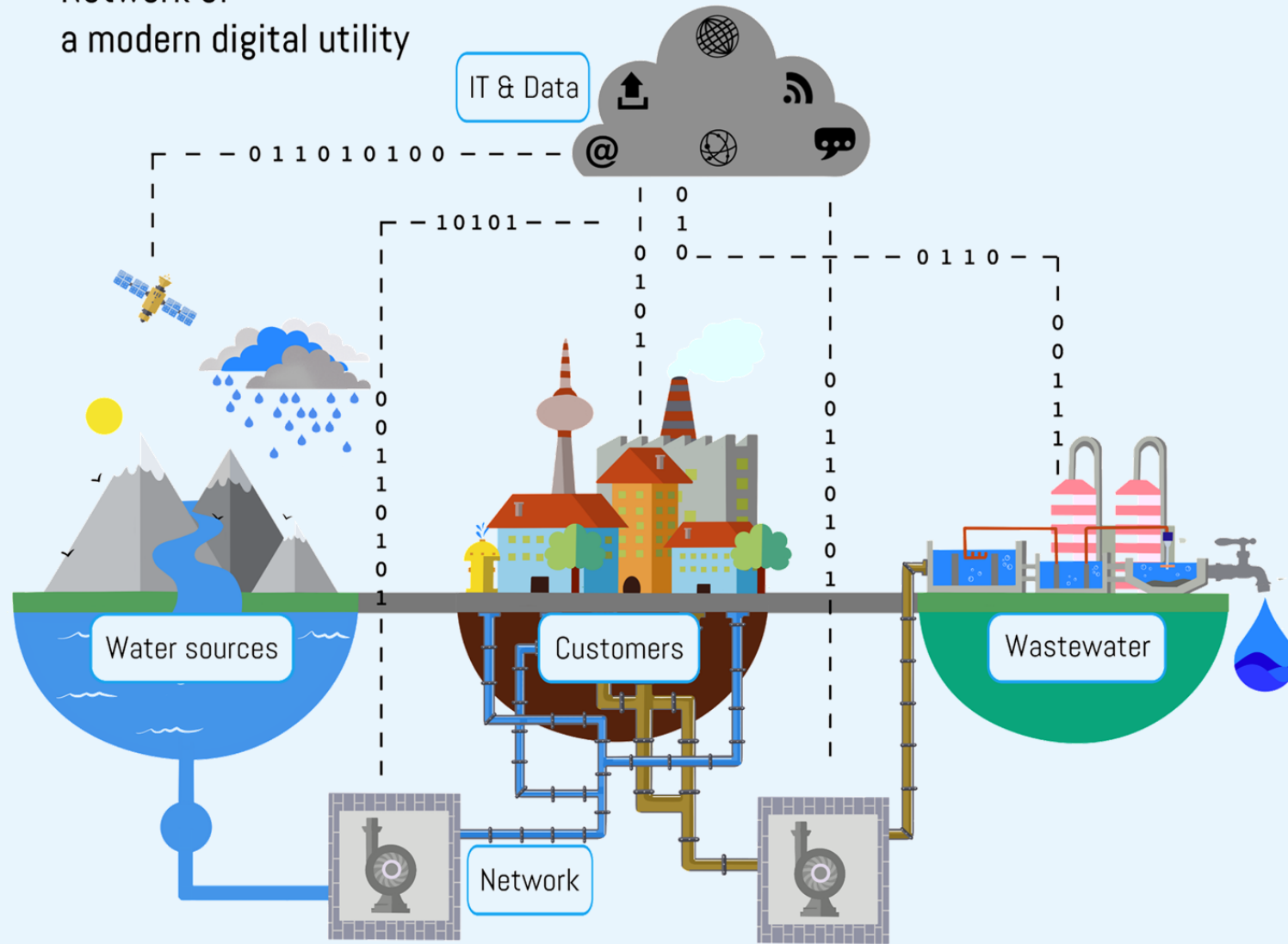


Network of  
a modern digital utility



# Smart Water Survey



VEGU21  
19-30 April 2021

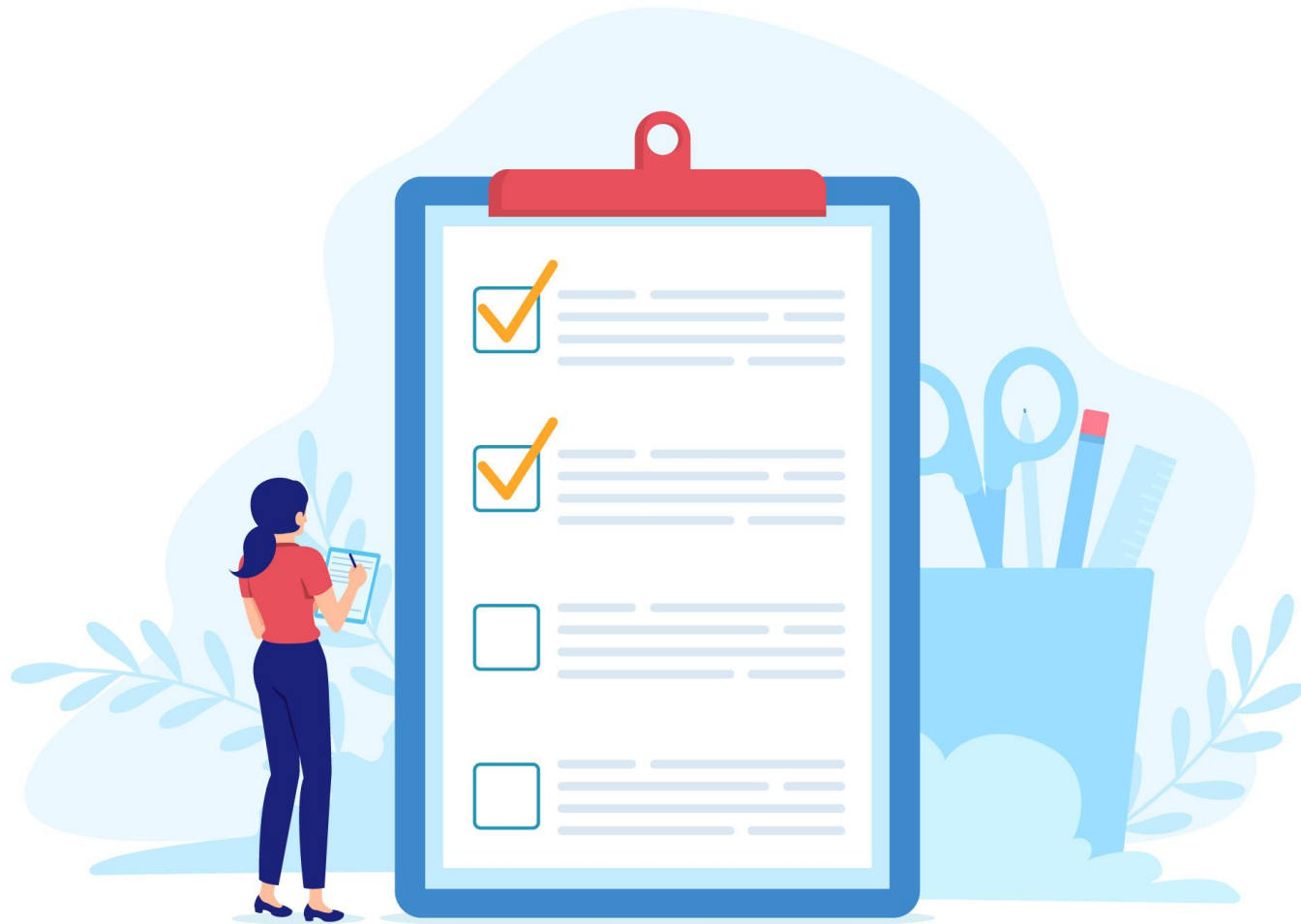
# Research question

How is digital transformation impacting the water utility sector?

## *Background:*

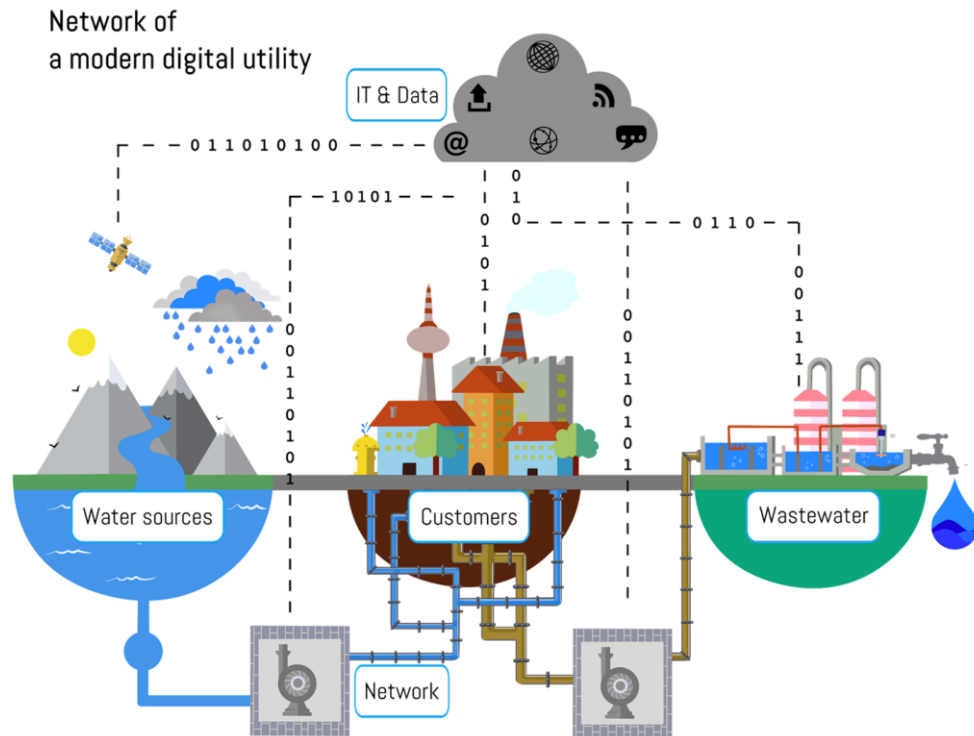
Water utilities across the globe are facing numerous challenges to their operations and management posed by [ageing infrastructure](#), [urbanization](#), and [climate change](#). Specific challenges include severe floods and droughts, changing urban water demands, costs related to the maintenance of infrastructure systems, and increasingly critical conditions for wastewater overflow in combined sewer systems. Recent developments of [digital technologies offer opportunities to address these challenges](#). Smart monitoring and automatic control, advanced analytics, informed demand management, and digital customer engagement open new paths to more efficient water use, better understanding of resource availability and quality, or faster detection of failures and anomalies. [Although many utilities have started the process of digital transformation, few of them are on the same track.](#)

- What are the drivers and challenges for digital transformation?
- What are the key enabling technologies?



# Survey setup

# Study design



## *Structure:*

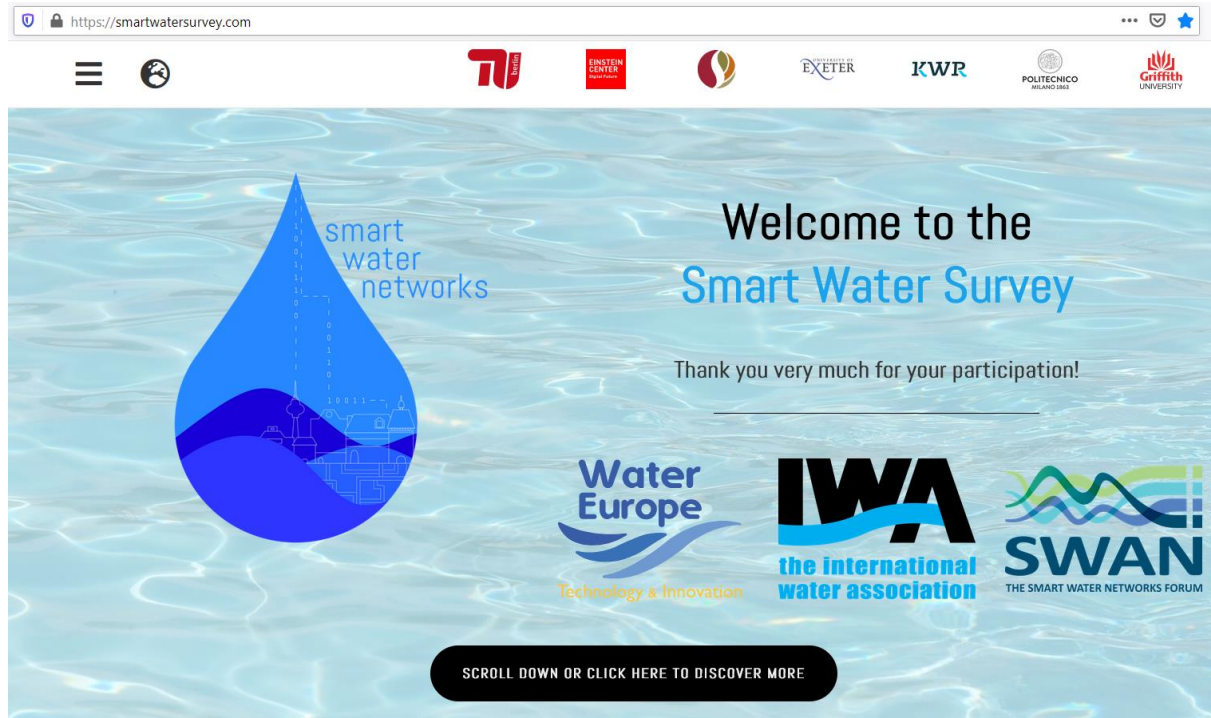
Smart Water Survey maps out a water utility's operating network and company structure as divided into **five different subsections**:

1. water supply & drinking water treatment
2. water distribution network & operating systems
3. wastewater & rainwater management
4. customers & demand management
5. data warehouse & IT systems

For each subsection, different aspects of the digital transformation are investigated. While some questions target specific aspects (e.g., Smart Meters) the **three questions at focus** concern

1. best practices and technologies
2. challenges entailed by the digital transformation process
3. drivers of digitalization process

# Study format



## *Web page:*

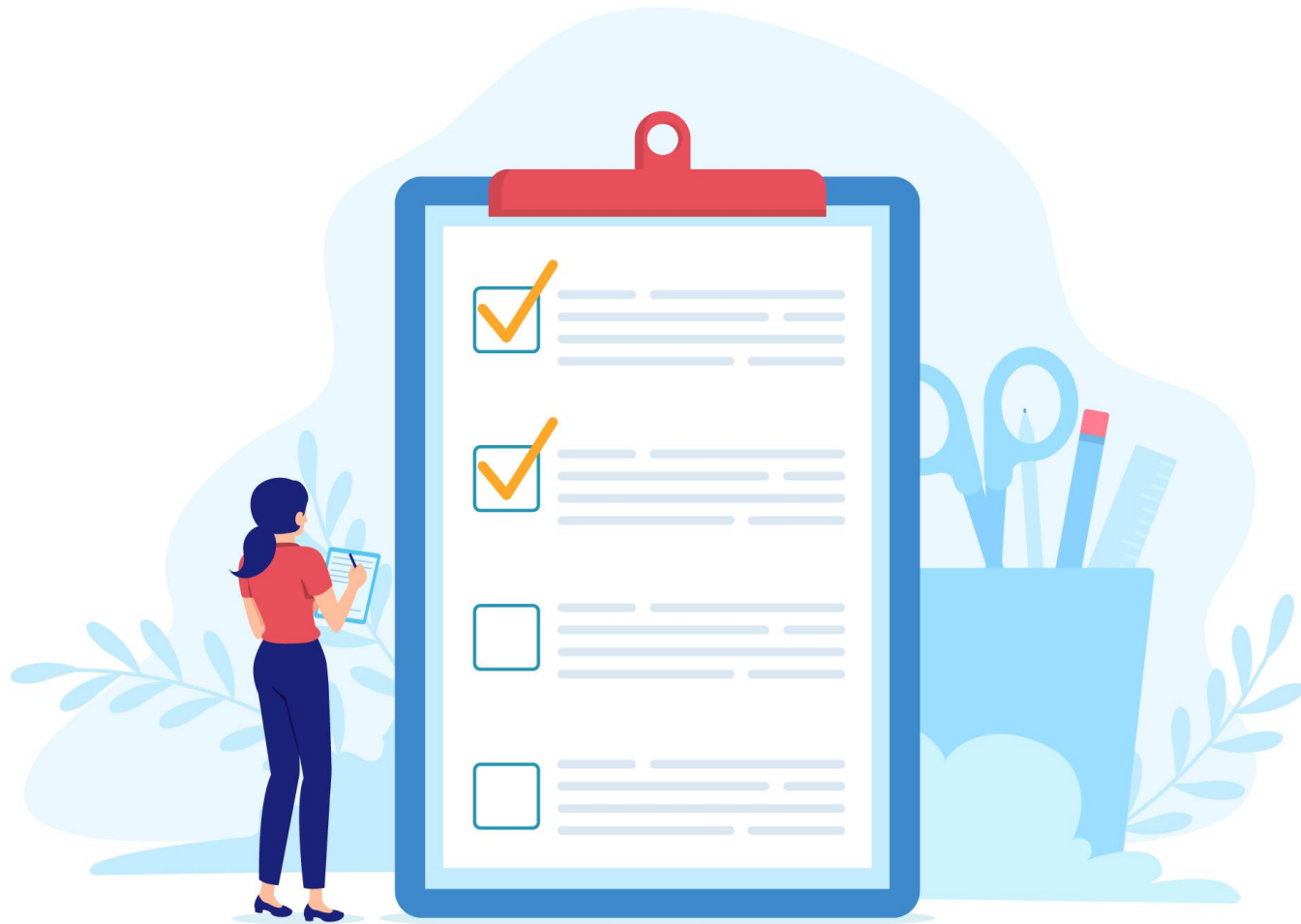
Smart Water Survey was hosted on an online platform at <https://smartwatersurvey.com>. This platform was custom built to fit all specific needs of the question and answer formats. For different questions, answer formats were constructed in the form of multiple choice, ranking, or plain text.

**Multiple choice** questions concerning the status of digital technologies contained four possible choices:

- Currently in operation
- Implementation ongoing
- Planned in the next 5 years
- Not planned at this time

Additional **plain text** questions were asked for selected technologies of special interest (e.g., smart meters) when answers indicated the use of this technology.

**Ranking** questions concerned the anticipated future challenges for which digitalization may present possible solutions.



# Evaluation & findings

# General description of the dataset

Total number of respondents:

➤ 64

Utility size (customers):

➤ Median: 695,072

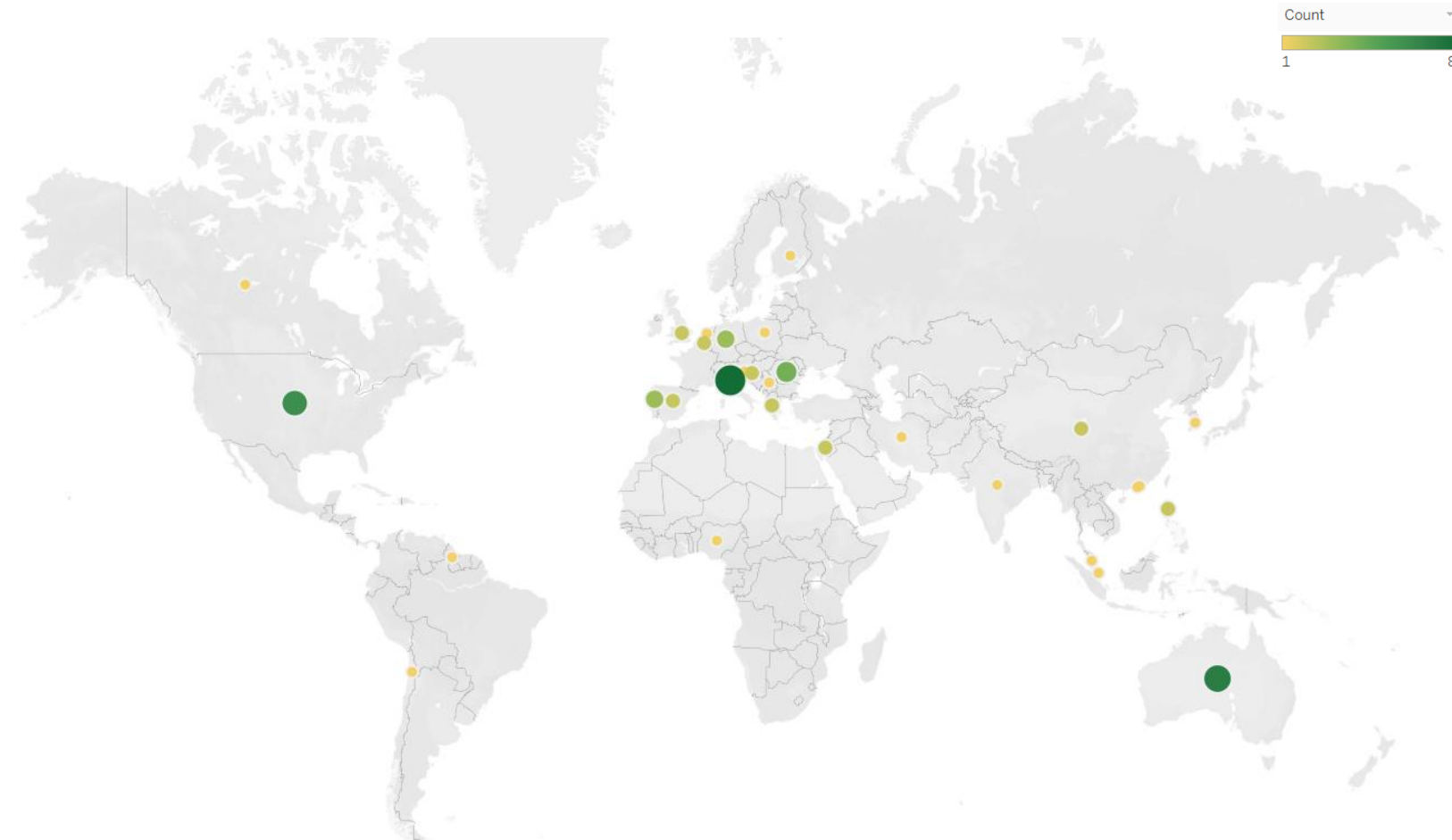
➤ 25%: 220,000

➤ 75%: 2,075,000

Ownership type:

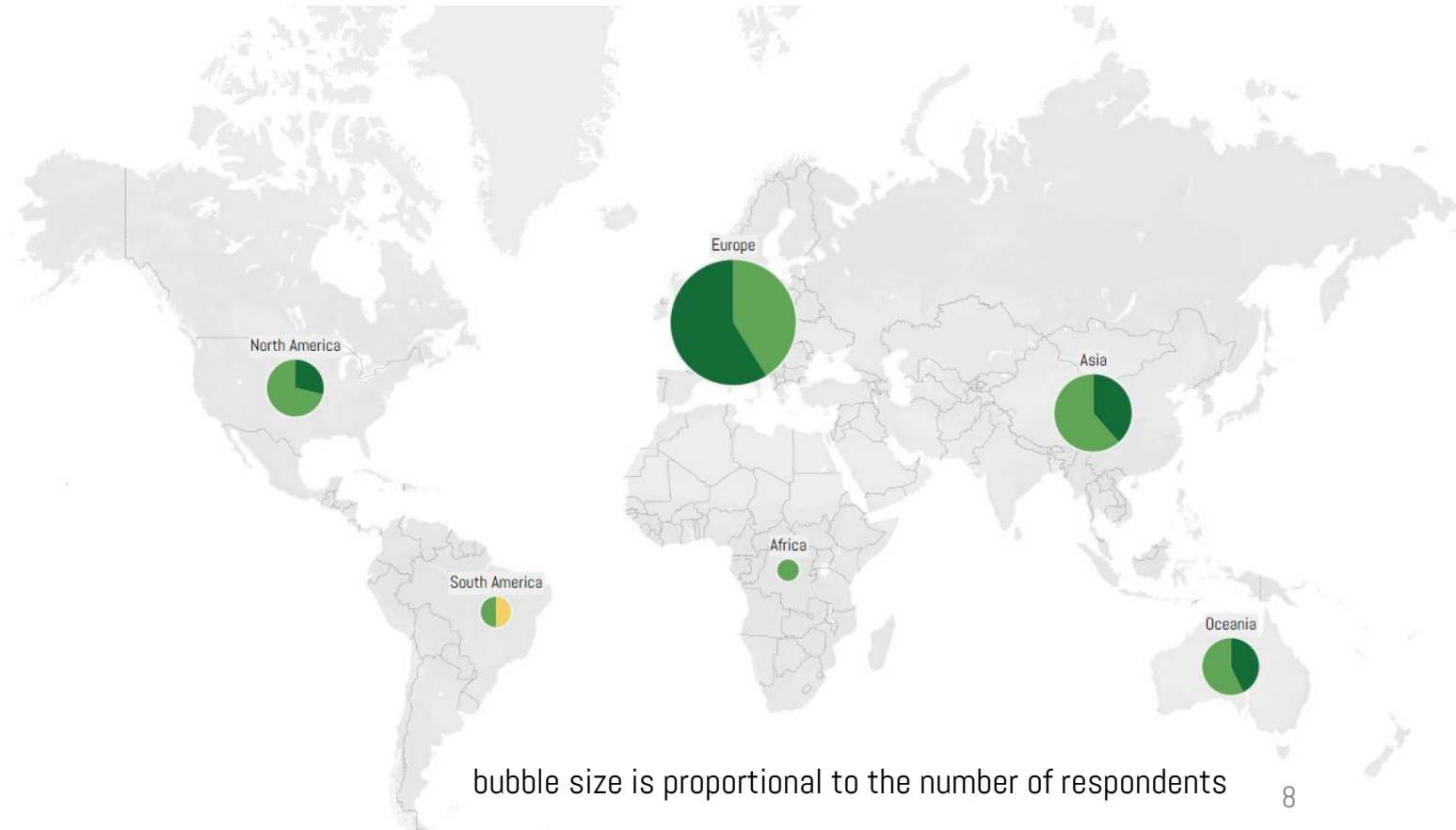
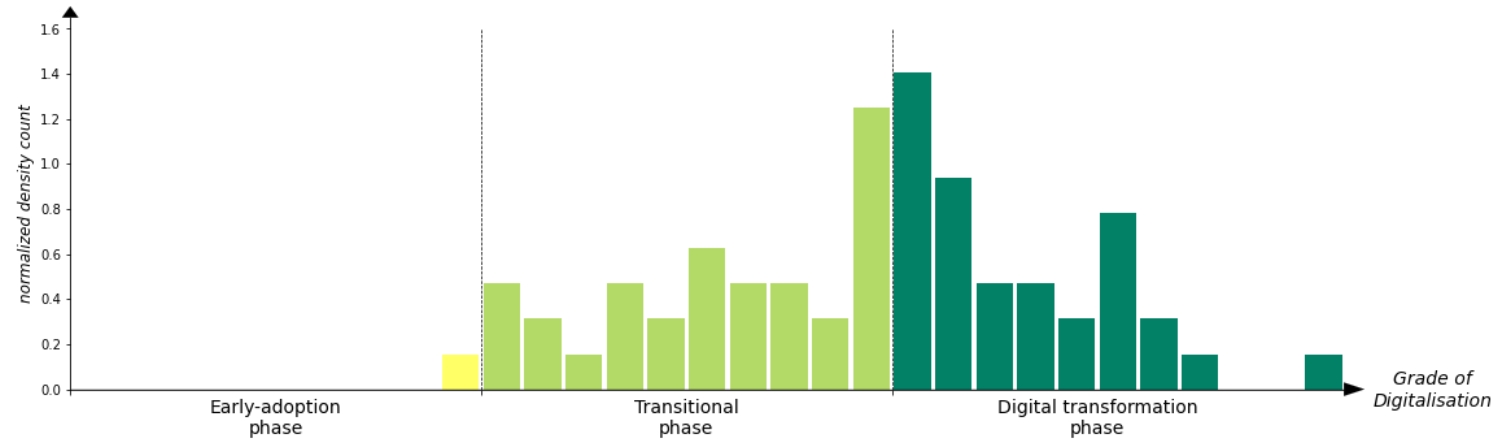
➤ Public: 81%

➤ Private: 19%



# I. Key finding

Most utilities in this sample have already started the digital transformation process and find themselves somewhere along the road, regardless of their origin, age, or size.

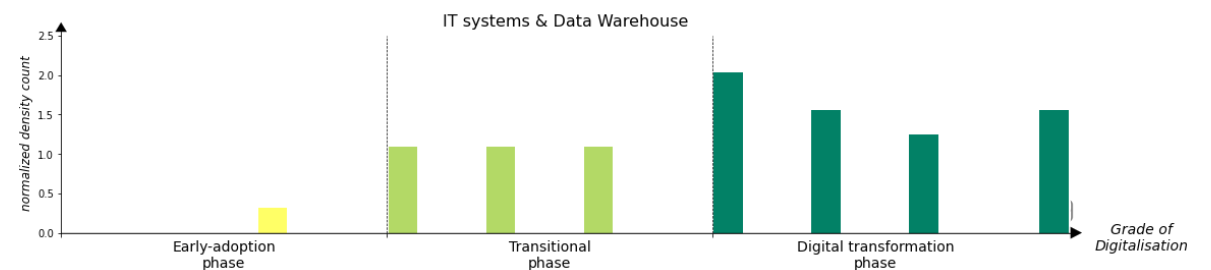
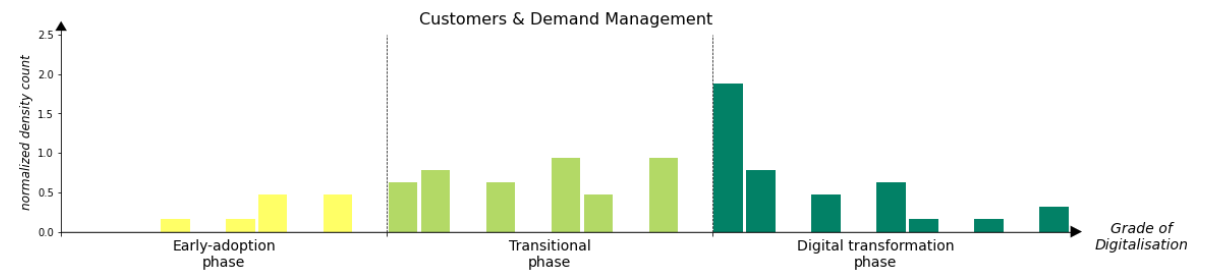
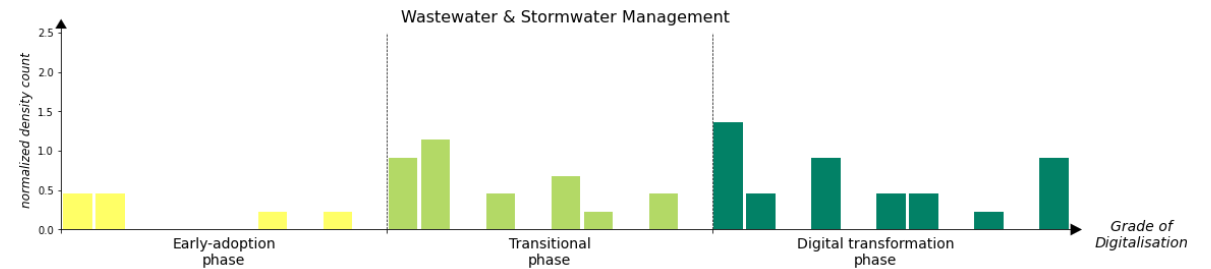
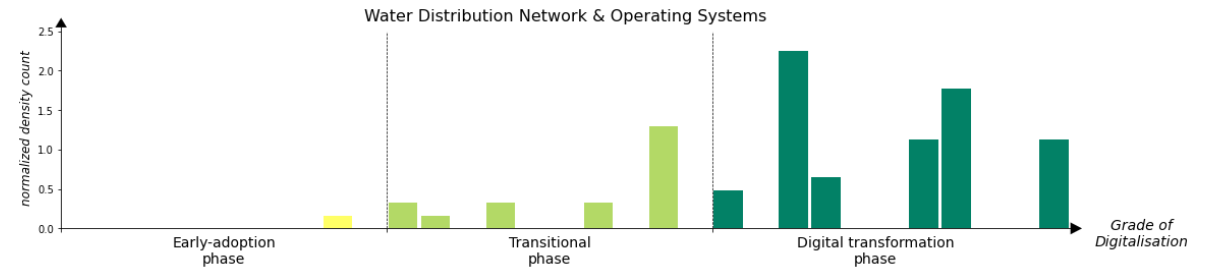
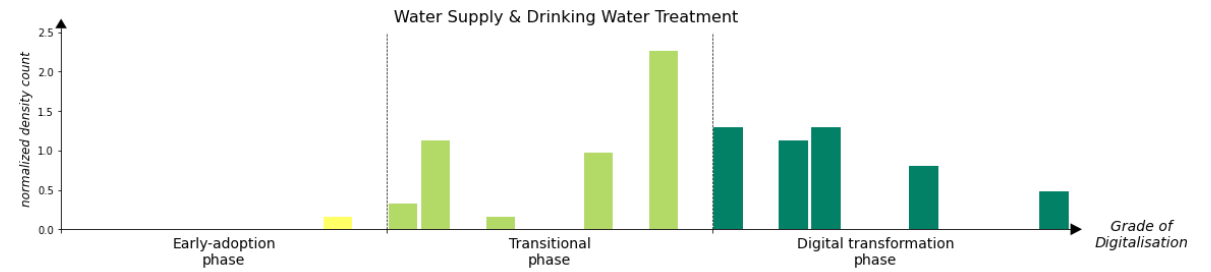




## II. Key finding

The process of digital transformation is tackled in all five sectors of a water utility.

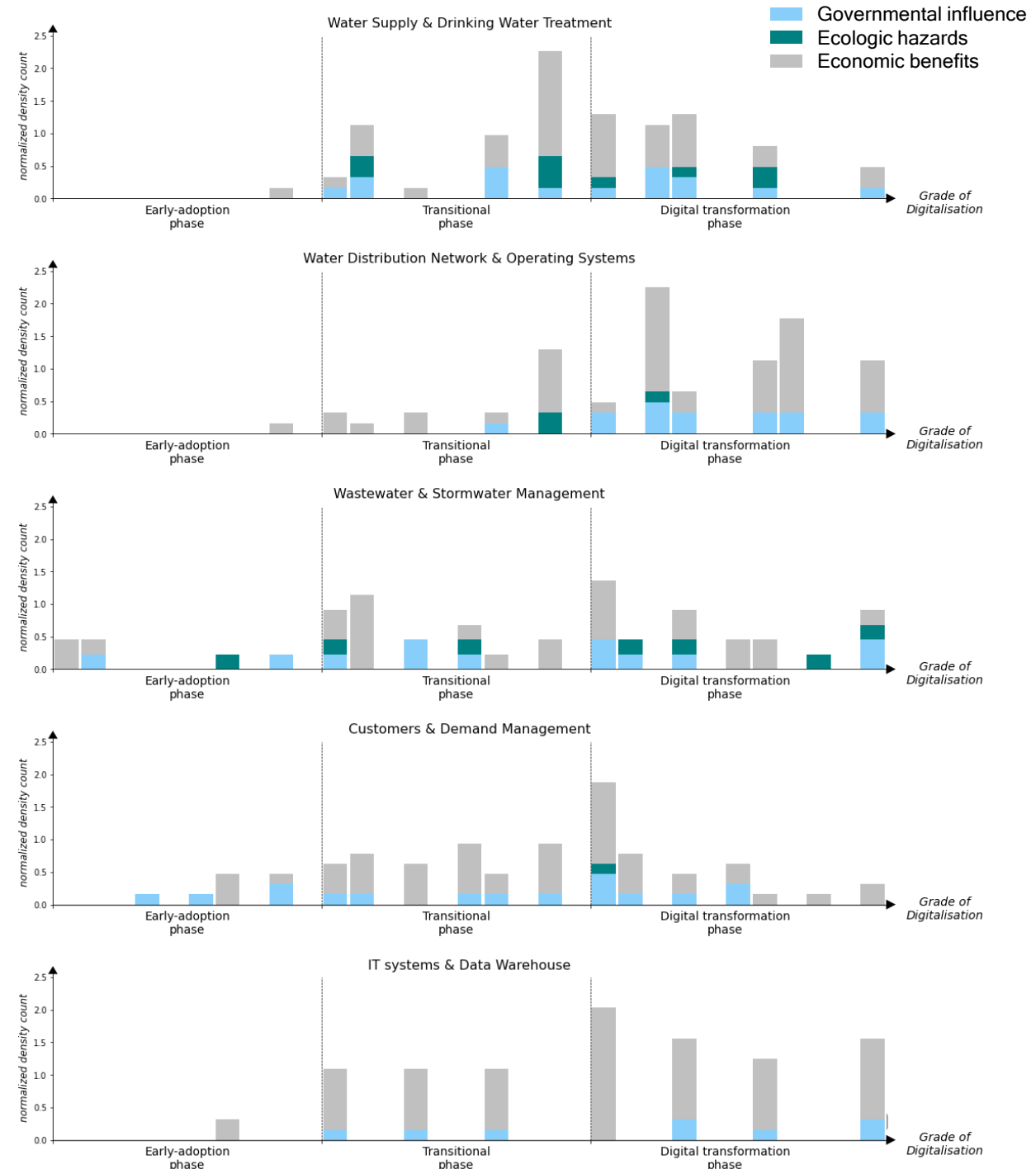
Adaption in the water supply and distribution network sectors appears slightly more advanced than in the wastewater sector.



# III. Key finding

The process of digital transformation is mostly driven by the prospective of economic benefits, indicated by 65% of answers summarized over all sectors.

Furthermore, 27% indicated that they are driven by governmental influence (e.g., regulation) and 8% by their concern of ecologic hazards (e.g., floods, droughts).

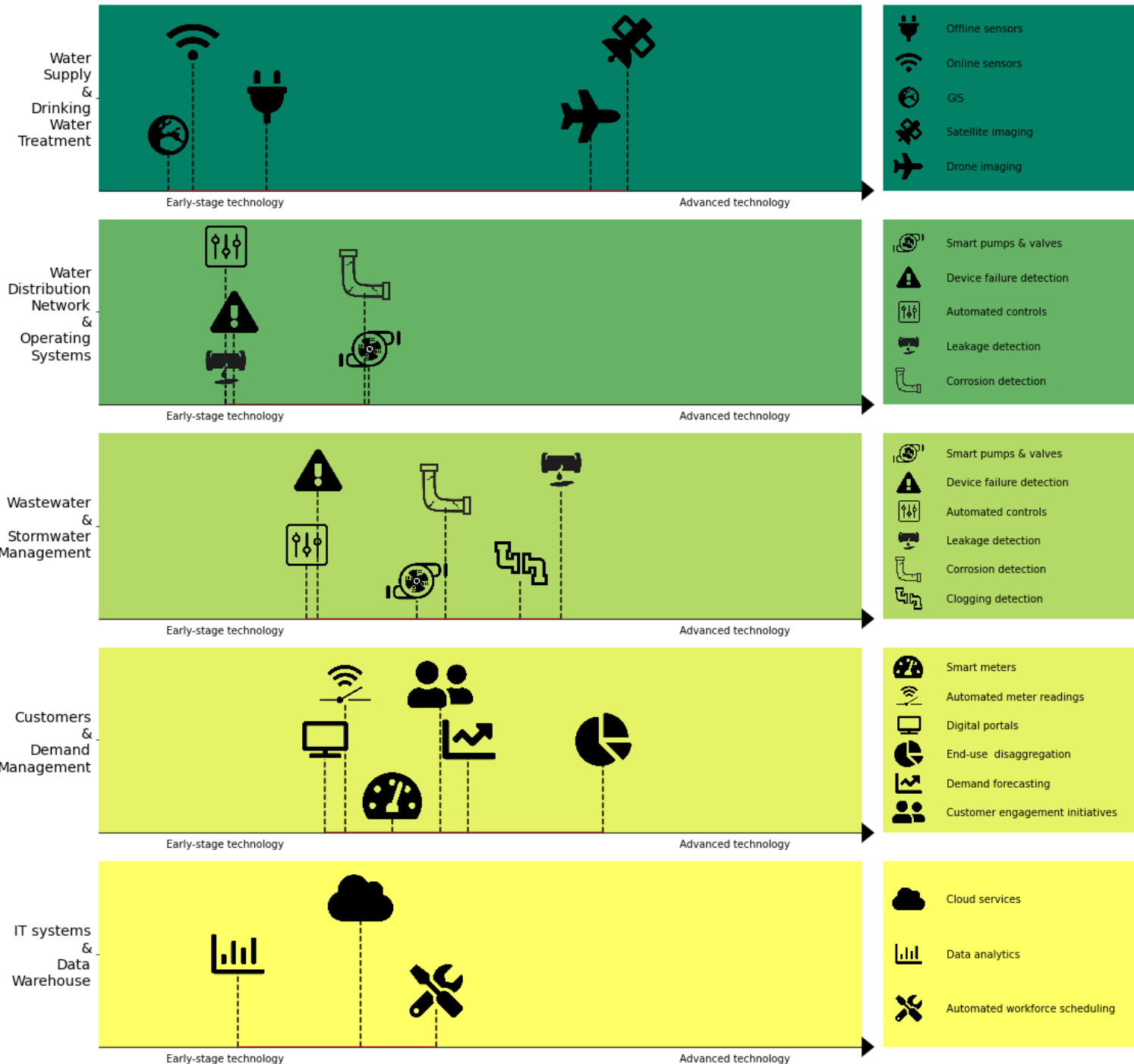


# IV. Key finding

All involved technologies across all sectors may be mapped on a singular timeline.

Early-stage technologies are implemented first by a majority of utilities. More advanced technologies are, in general, adopted later.

Moreover, this analysis allows for the comparison of the relative timing of implementation between technologies of different sectors.



# Discussion

- *Sampling bias:* The survey was open for all utilities providing water-related services and hosted on the internet.
- *Non-response bias:* We are aware that, possibly, utilities that are farther advanced in their digitalization process may be more likely to share insights, while utilities who have not undertaken this transition may be reluctant to participate.
- *Acquiescence bias:* All dichotomous questions remain free from personal opinion.
- *Question order bias:* To our awareness, there is no priming effect in the order of questions.
- *Primacy bias:* This bias does not apply because answers to multiple choice question are provided on a Likert-scale.

# Conclusion

Smart Water Survey concludes **four key findings**:

1. Digital transformation is independent of utility origin, size, or age.
2. Digital transformation is tackled in all sectors of a utility.
3. Economic benefits are the major factor in driving digital transformation.
4. Individual technologies for digital transformation can be mapped on a timeline of implementation.

While we are aware that the non-response bias may limit the overall representativity of this study, the results may serve as a guideline both for utilities to outline their individual process for digital transformation and for governments to take action in incentivizing utilities.

# Thank you!

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