

A close-up, high-speed photograph of water splashing, creating numerous bubbles and ripples. The water is a deep blue color, and the lighting highlights the texture and movement of the liquid. The background is slightly blurred, focusing attention on the central splash.

# Innovation in Water Utilities

Helping transform utilities into Utilities of the Future

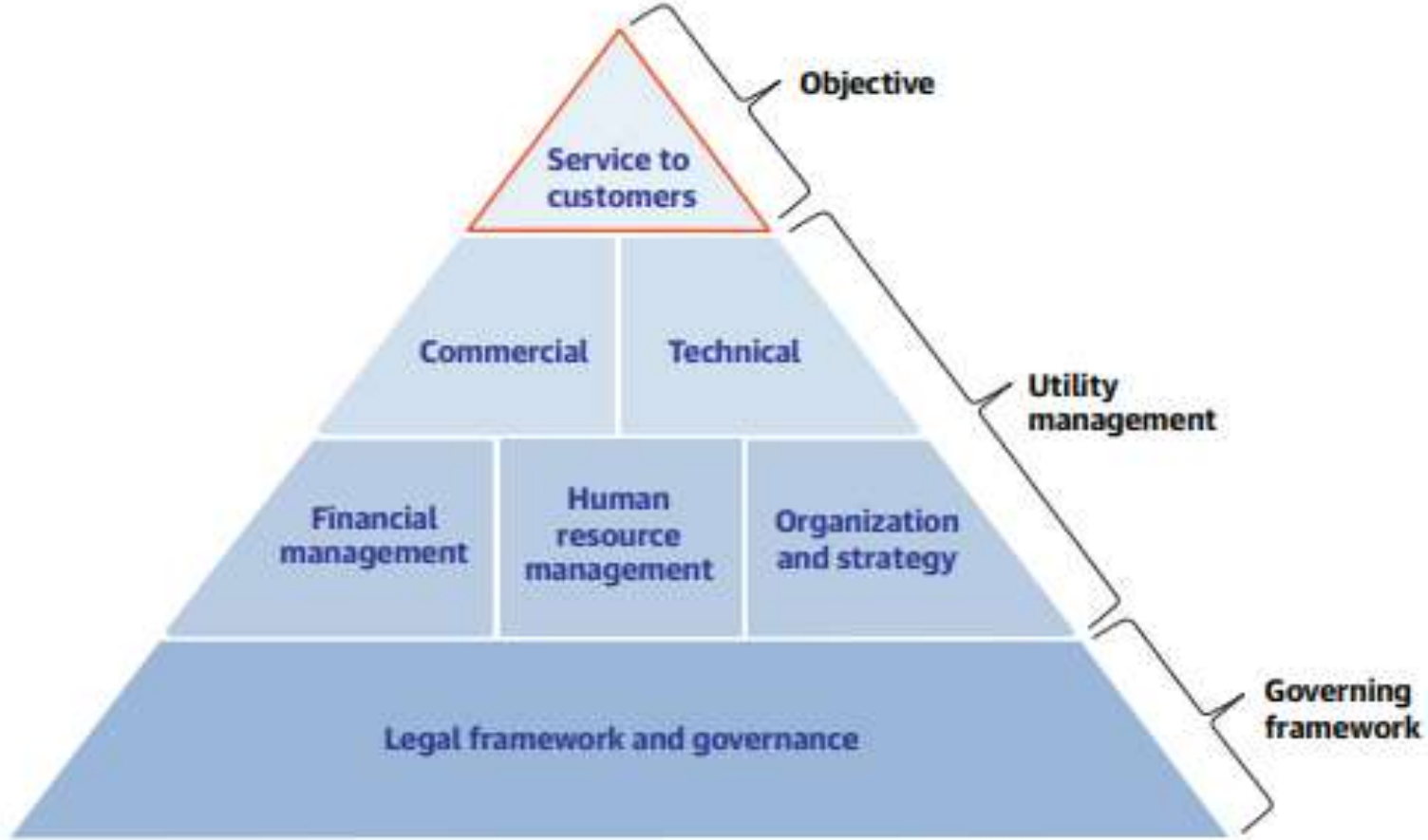
Camilo Lombana Cordoba  
Senior Water Supply and Sanitation Specialist  
World Bank, Africa Region



The ultimate goal for water utilities is to provide services that are reliable, safe, and inclusive

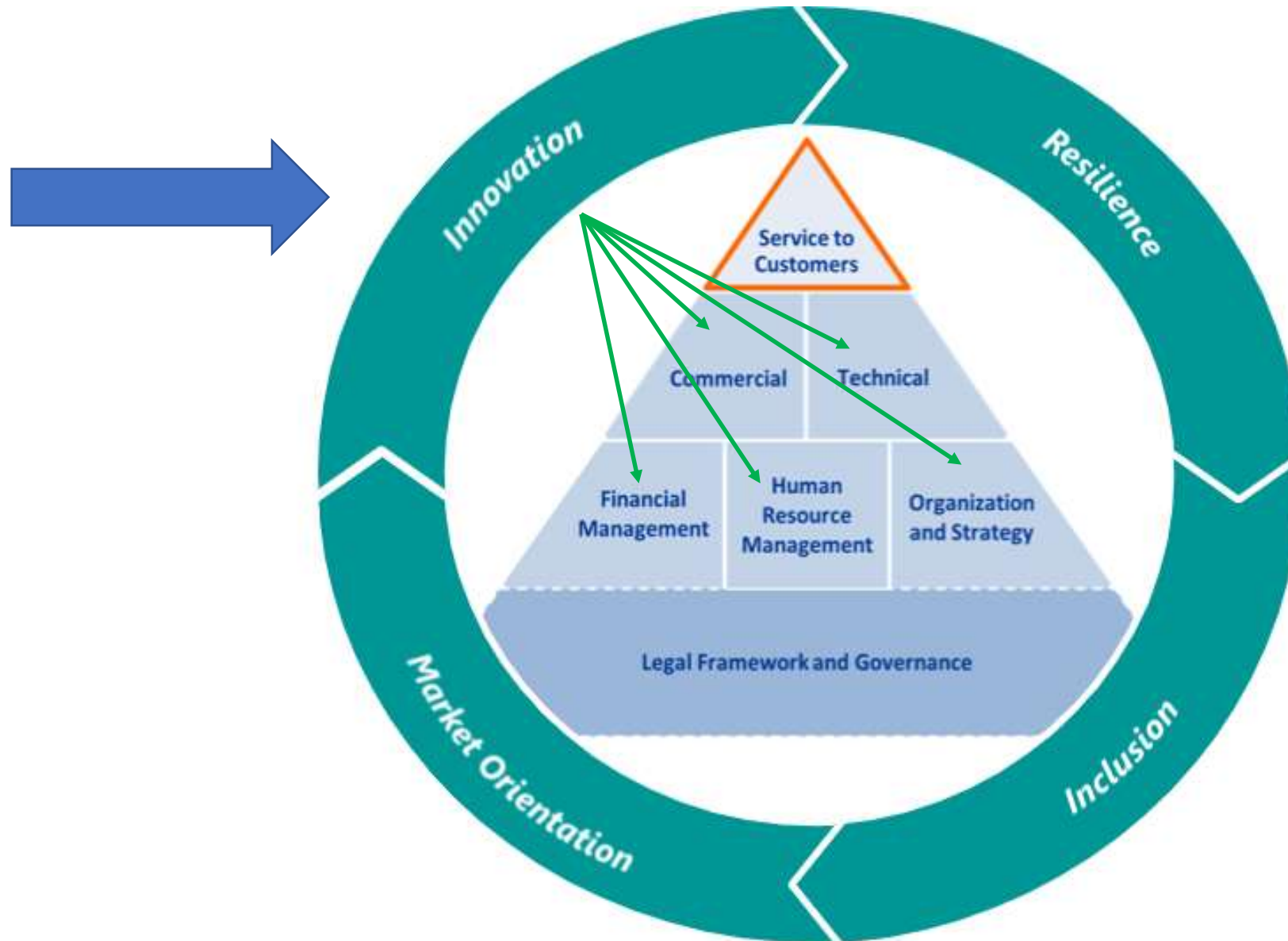
Water utilities across the world have similar objectives. However, they face different challenges based on their local contexts, and their level of performance.

Water utilities need to work holistically on the traditional elements of utility performance to have satisfied customers



Source: Adapted from Heymans et al. 2016.

There are various dimensions that need to be considered through which performance of utilities can be improved



# Innovation is today's buzz word...and it is no strange to the water sector

## The Drop: Water Technology Innovation in Gwinnett County

The Water Tower's sprawling campus will foster water technology advancement. CEO Melissa Meeker explains.

Feb 10th, 2020

## Water Technologies Awarded for Second Round of The Water Council Tech Challenge

A.O. Smith Corporation, Badger Meter, and Zurn Industries select two water technology innovations among 22 applications.

Feb 3rd, 2020

## Urban resilience: UK municipalities, water utilities collaborate to combat effects of climate change

A new peer-to-peer platform is helping municipalities and water utilities find reliable innovative solutions to their infrastructure resilience challenges.

Jan 30th, 2020

FEBRUARY 12, 2020  
BY CONTRIBUTING  
AUTHOR

## Non-Revenue No More: West Virginia Utility Gets Strategic with AMI

## ecoSPEARS selected for prestigious clean water accelerator

Imagine H2O to tackle global water crisis through its annual Clean Water Accelerator program.

Jan 22nd, 2020

## The Innovation Hub: Utilities should be creative

Jan 27, 2020 0

A close-up photograph of a person's hands being washed in a sink. Water is running from a chrome faucet, creating a spray of water droplets. The person's hands are positioned under the water, and the background is slightly blurred, showing the white porcelain of the sink and the person's skin.

## But innovation for innovation's sake is not necessarily good

In the face of scarce funding and urgent challenges, innovation and technology need to be the means to the end goals of water utilities; they need to improve the traditional elements of utility performance

**Question:** How do we leverage existing technology and smart tools to support the five traditional elements of utility performance?

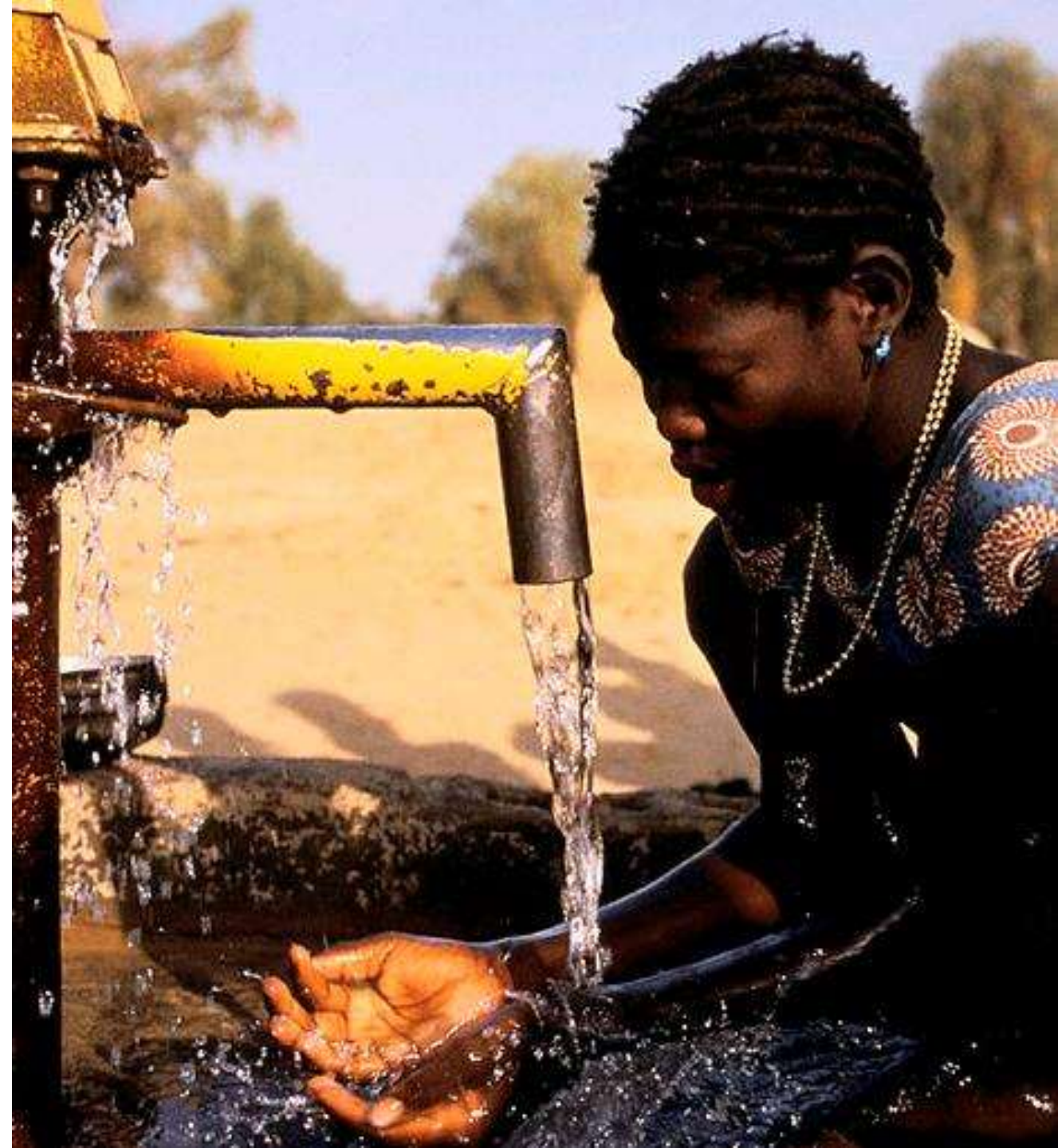


## The Utility of the Future (UoF) - a tool

- The WB has developed the UoF tool to help utilities incorporate dimensions of innovation, market orientation, resilience and inclusion into their planning and implementation of activities to achieve performance objectives.
- Utilities do not have to necessarily follow a sequenced approach followed by other utilities to reach their desired level of performance; they can leapfrog toward goals that are locally relevant.

Utilities that work holistically on traditional elements of utility performance and incorporate new dimensions of UoF will become a Utility of the Future themselves

**Definition of a Utility of the Future:** a future-focused utility which provides reliable, safe, and inclusive water supply and sanitation services through best-fit practices that allow it to operate in an efficient, resilient, and sustainable manner.



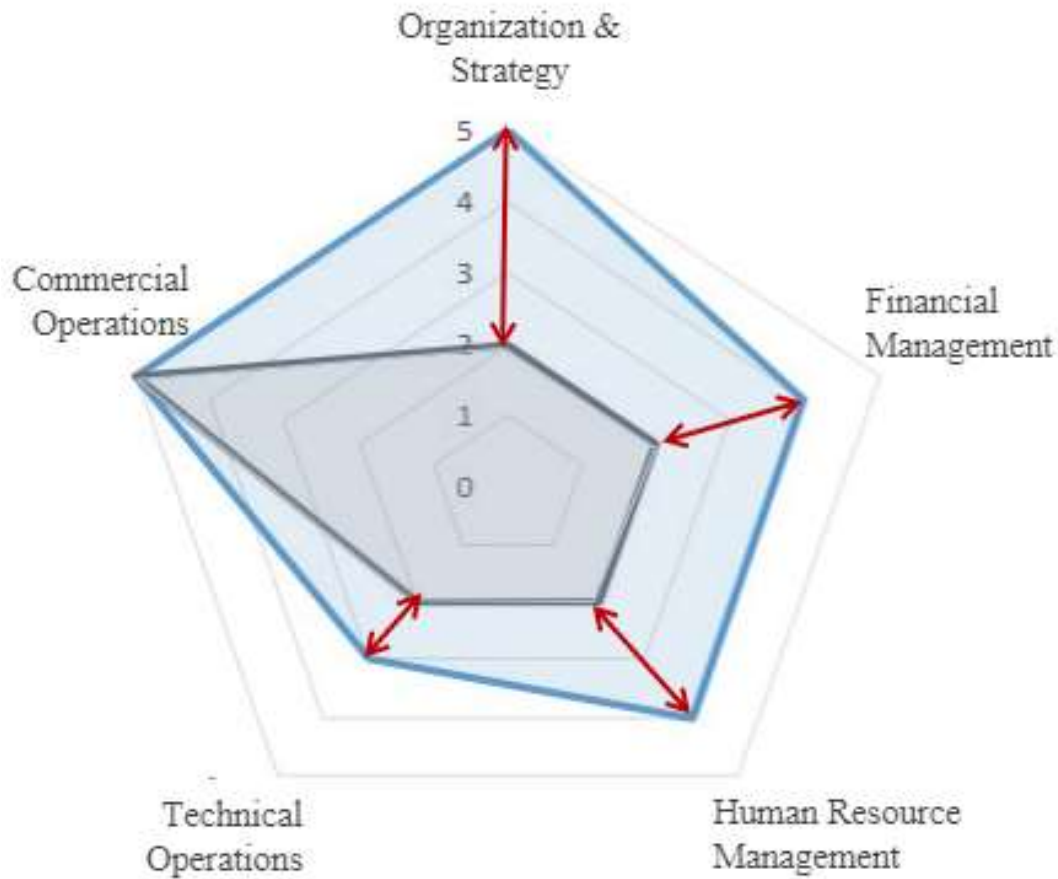




# The Utility of the Future – Ex: Commercial Mgmt.

		Maturity Levels					
Area	Topic	Elementary 1	Basic 2	Good 3	Well-Perf. 4	World-Class 5	Utility of the Future
Commercial/ Metering	Type of meter	None	Mechanical meters, which do not meet international standards	Mechanical meters, which are manufactured to international standards			Electronic meters
	Meter reading	None	Manual	Manual input to electronic device	Walk or drive remote metering	Full remote intermittent	Full remote from HQ continuously
	Data reconciliation meter reading, billing and accounts data is consistent	No link; no check for consistency	No link; infrequent checks for consistency	Manual link; routine checks for consistency	Automatic link; routine checks for consistency		Real time reconciliation
	Testing and replacement	Not tested; not replaced	Tested infrequently; not replaced	Tested routinely; replaced infrequently	Tested and replaced in accordance with manufacturer guidelines		Tested and replaced in accordance with manufacturer guidelines

# From Outputs to a List of Actions



— Improved performance    — Initial Maturity

## Improving from a Level 2

		1	2	3	4
Technical Operations	Asset management	Green	Green	Red	Red
	Non-revenue water	Green	Green	Red	Red
	Maintenance	Green	Green	Red	Red
	Water quality and treatment	Green	Green	Red	Red
	Wastewater management	Green	Green	Red	Red

## Technical Operations Action Matrix

Action	Estimated Cost	Relative Impact	Estimated duration
Develop basic strategy for managing NRW	\$250,000-\$1 mil	High	6 to 12 months
Meter all water production facilities	\$1-\$5 million	Medium	6 to 12 months

# Innovation in the water sector

## What is “smart” water?

Sensors and  
Connected Devices



Data Analytics



Automation



# Innovation in the water sector – Sensors in Water Supply



Smart meters at customer's properties can serve multiple functions:

- 1) Provide **information to generate monthly bills**;
- 2) **Identify abnormal usage** to notify customers about their high consumption or a potential leak on their side of the meter;
- 3) Determine total demand to **quantify nonrevenue water**; and
- 4) Where water supply zones are metered, **identify which zones have the highest leakage rates** which may need to be addressed.

# Innovation in the water sector – Sensors in Wastewater treatment

Advances in information, communications and sensor technology now make online monitoring of pollutants such as bacteria faster to:

- 1) **Decide whether to continue abstracting** from a particular water source
- 2) **Adjust processes** setpoints in Wastewater Treatment Plants
- 3) Investigate water quality issues and **take remedial action** (such as increase chlorine dosing)

Low cost sensors for other determinants such as chlorine concentration and turbidity are also increasingly being used to continuously monitor water quality in potable water distribution systems

## Main Takeaways

- Water utilities need to improve upon the traditional elements of utility performance to have satisfied customers
- **Innovation for innovation's sake is not necessarily good. It's a means to an end**
- Innovation does not only entail technology but improvement of existing processes through other means as well
- **Utilities don't need to follow a predetermined sequenced approach for improvements; they can leapfrog to their goals based on local context**