

Digital Twins: How Wastewater System Operation Flows From Data to Intelligence

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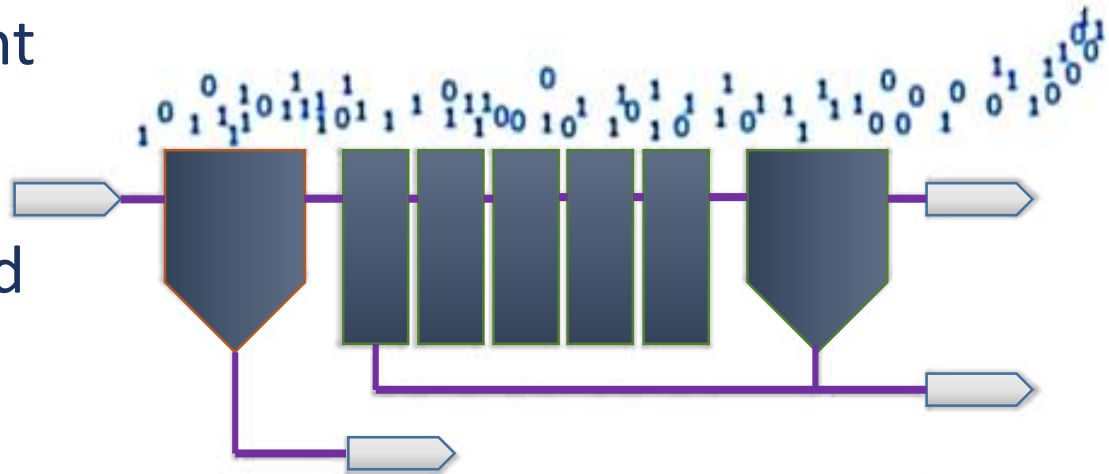
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Why data is important in WWTPs?

- Central for process control
- Essential for plant control
- Process-wide and plant-wide interactions
- Automation and digitalization

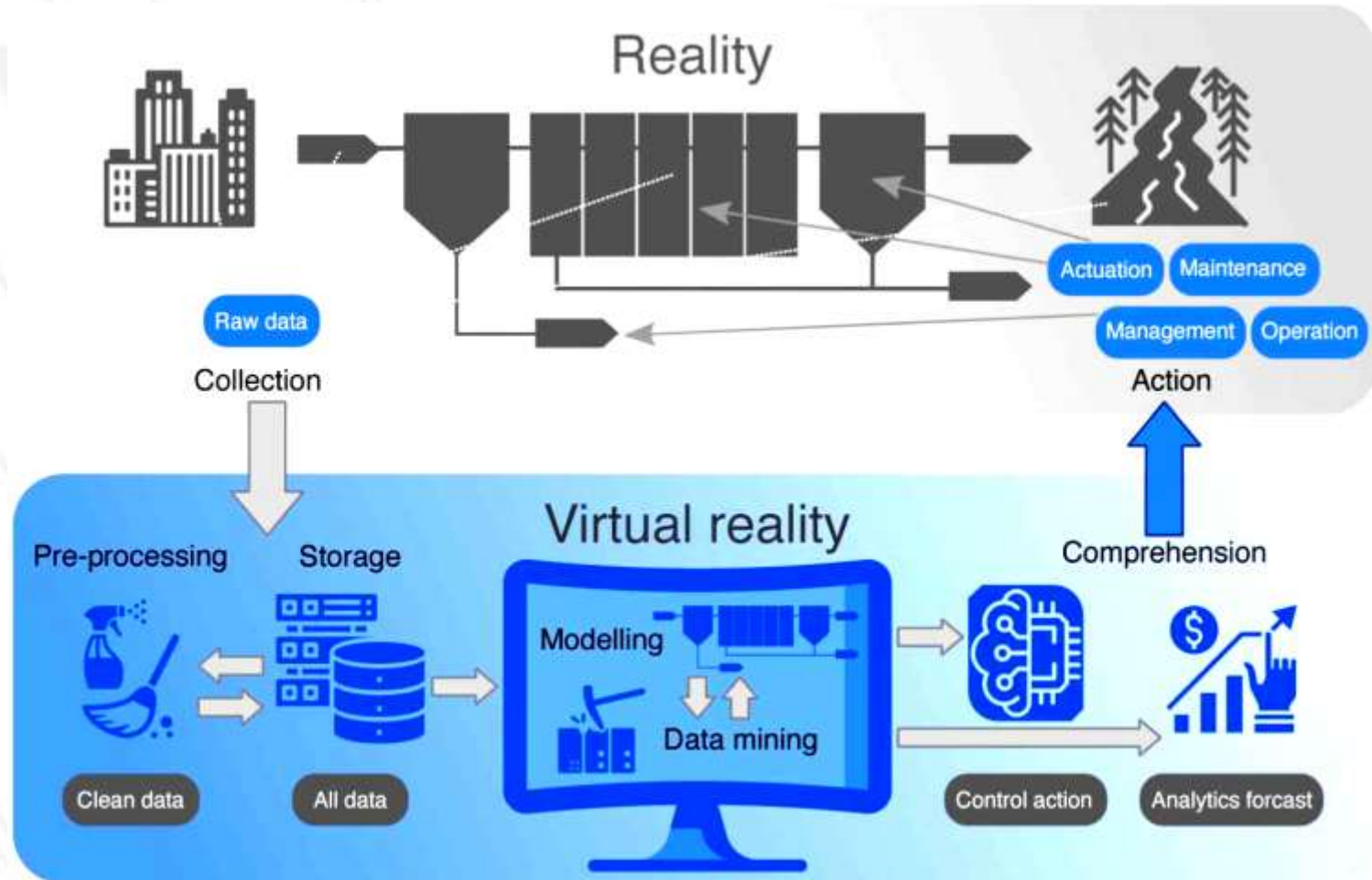




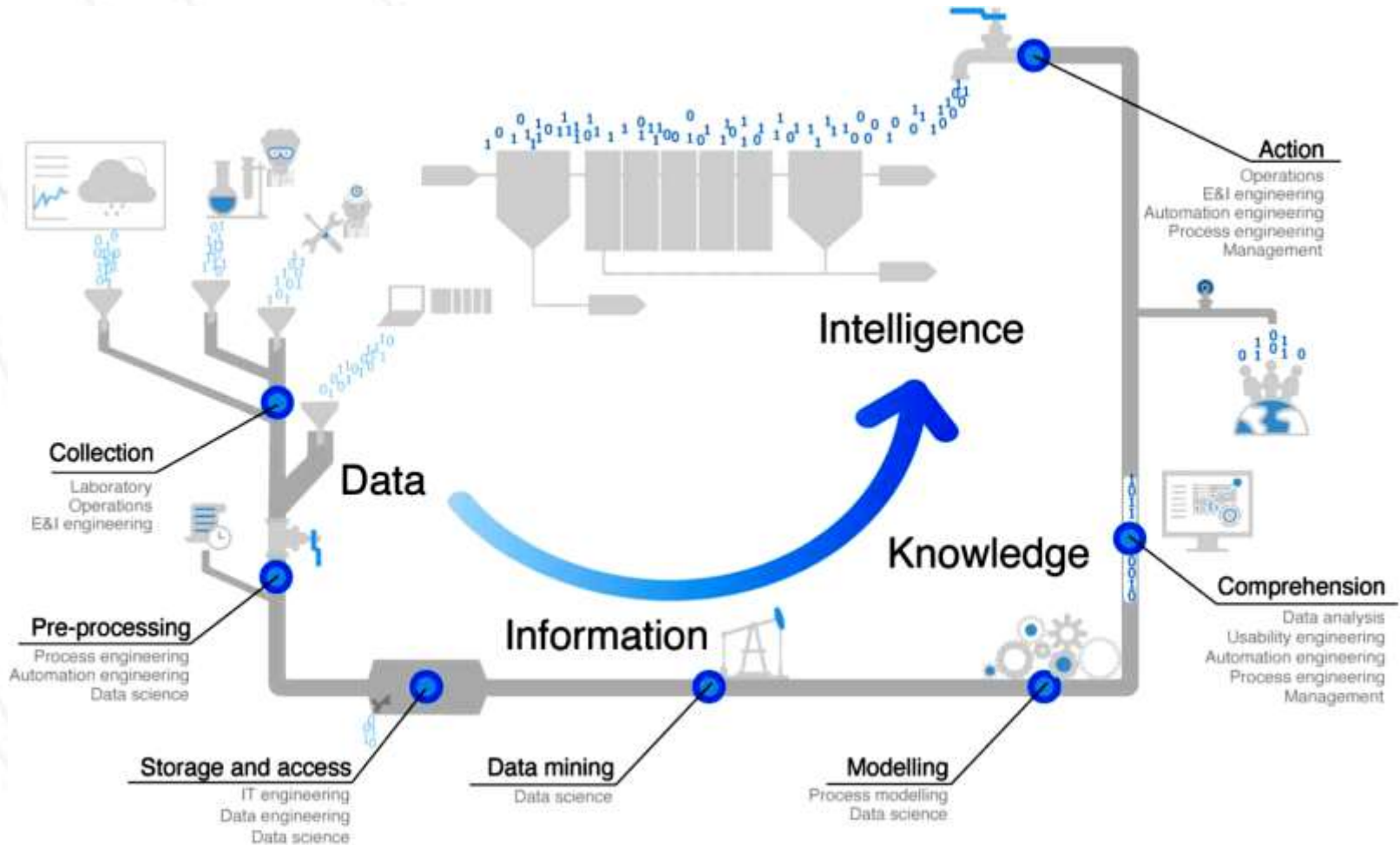
What is a Digital Twin?

- Introduced by Grieves in 2002 for PLM.
- Virtual systems that contain all important characteristics and features of the real system.
- Constant monitoring and reflection of current state of the physical plant.
- Can make predictions on the future state of the physical system

Digital Twin in WWTPs



Data Lifecycle in WWTPs

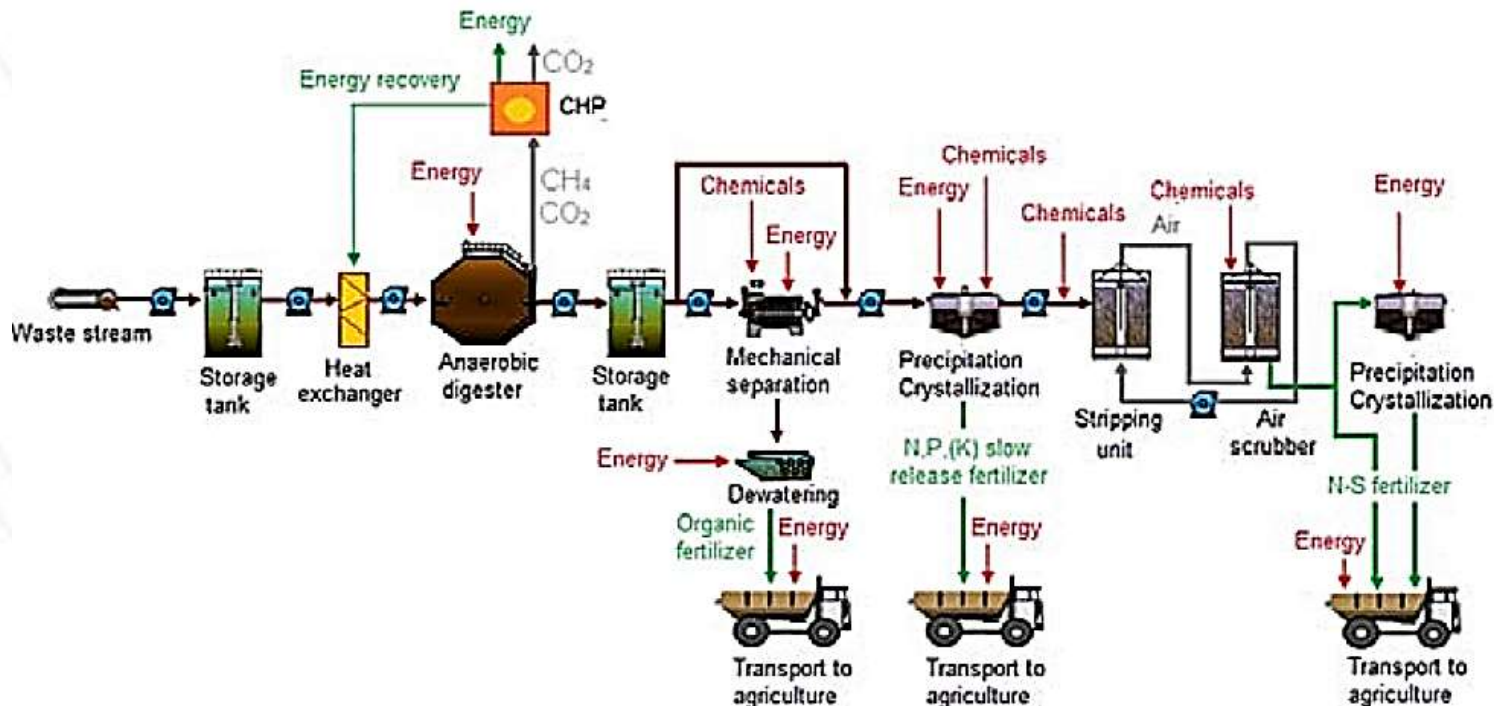


Key challenge for DT in WWTPs



Conclusion

- High quality data are crucial for DT of WWTPs
- Digital twins can predict future scenarios
- Much of the data in wasted in WWTPs.



Further studies

- Kolditz, O., Rink, K., Nixdorf, E., Fischer, T., Bilke, L., Naumov, D., Liao, Z. & Yue, T. 2019, Environmental information systems: paving the path for digitally facilitated water management. *Engineering* 5 (5), 828–832. doi:10.1016/j.eng.2019.08.002.
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- He, R., Chen, G., Dong, C., Sun, S., Shen, X., Data-driven digital twin technology for optimized control in process systems. *ISA Transactions*, 95, 2019, 221-234, <https://doi.org/10.1016/j.isatra.2019.05.011>.
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