



baywork

Bay area water/wastewater workforce reliability

THE DIGITAL WORKER

Using Digital Tools to Deliver Water Services

Presented by Catherine Curtis
Workforce Reliability, SFPUC
BAYWORK Board Member

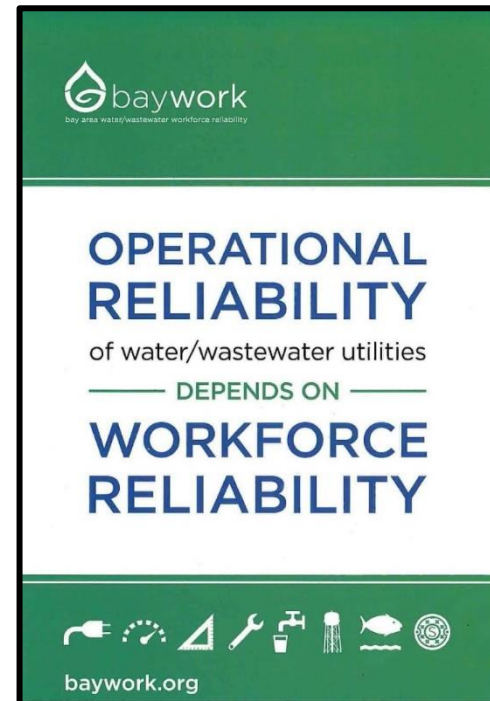
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[BAYWORK White Paper](#)

What is BAYWORK?

A consortium of
water/wastewater
agencies and
stakeholders with a
shared commitment to
workforce reliability

Baywork.org



BAYWORK Roadmap



Develop qualified candidates for mission-critical jobs

Provide staff with the information they need to do quality work

Modify work to optimize use of staff available

Maximize investments through collaboration

Mission-Critical Job Categories



Electrician



Wastewater Treatment Operator



Electronic Maintenance Technician/Instrument Technician



Water Distribution Operator



Engineer



Water Treatment Operator



Machinist/Mechanic



Wastewater Collections Operator

BAYWORK's Digital Worker Initiative

To help water/wastewater utilities everywhere make more effective use of digital tools



BAYWORK's Digital Worker Initiative

2019

Research on utility use of digital tools

Workshop on Workforce Implications of Digital Tools – Workforce Convening

2020

Focus group meetings with utilities on challenges and lessons learned

Workshop on The Digital Worker – Utility Management Conference

Launched White Paper Initiative

2021

Published The Digital Worker: Effective Use of Digital Tools to Deliver Water Services

Webinar on The Digital Worker – BAYWORK Event

Presentations to World Bank, Training Buffet, SWIM Conference

BAYWORK Project Advisory Group

33 members from across the US and Canada

14 representatives of water/wastewater utilities, including operations staff and information technology experts (including 6 representatives from BAYWORK Signatories)

7 representatives of Professional Associations and Community Based Organizations

12 consultants

BAYWORK Project Advisory Group

BAYWORK

WEF

AWWA

CWEA

Water Research Foundation

General Managers

Operations

Maintenance

IT Specialists

Consultants

Role of Advisors:

- Provide written input on experiences, questions, and lessons learned in relation to topic areas
- Contribute to a discussion of these topic areas in an Advisory Group videoconference
- Review and provide feedback on a Draft White Paper on The Digital Worker
- Participate in Possible Next Steps Discussions
- Option to attend the BAYWORK Digital Worker Workshop

The Digital Worker White Paper Topics

Selection of Digital Tools

Organizational Culture

Coordination with Existing Workflows and Systems

Information Technology Support

Human Resource Services

Initial and Ongoing Staff Training

Developing Qualified Candidates for Digital Jobs

Artificial Intelligence

Cybersecurity

Selection of Digital Tools

Significant Challenges for the Water Industry

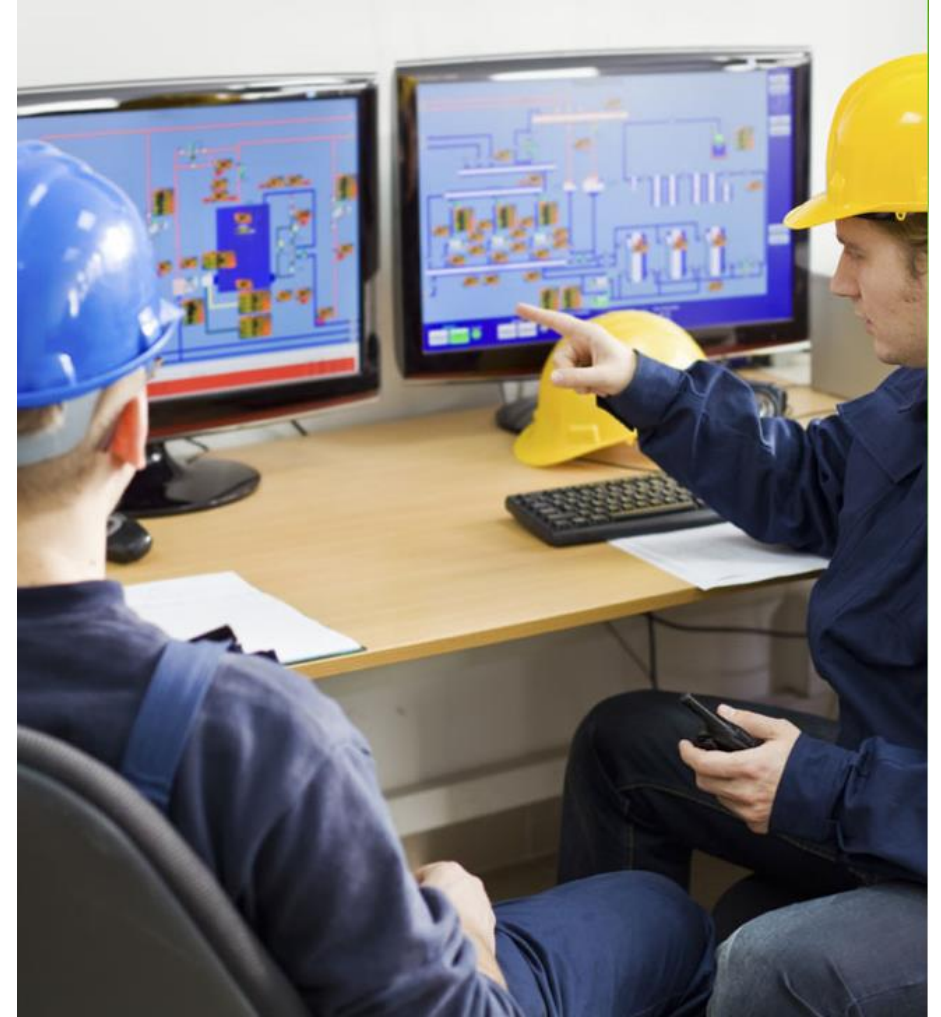


- Specialized market
- High consequences of failure
- Details matter
- Many failed implementations

Selection of Digital Tools

Planning Challenges

- Does the utility have a clear idea of the problem it is trying to solve?
- Will the utility invest the time and resources to obtain sufficient input from staff?
- Will the utility analyze the capabilities of its organization as carefully as the capabilities of the tool?

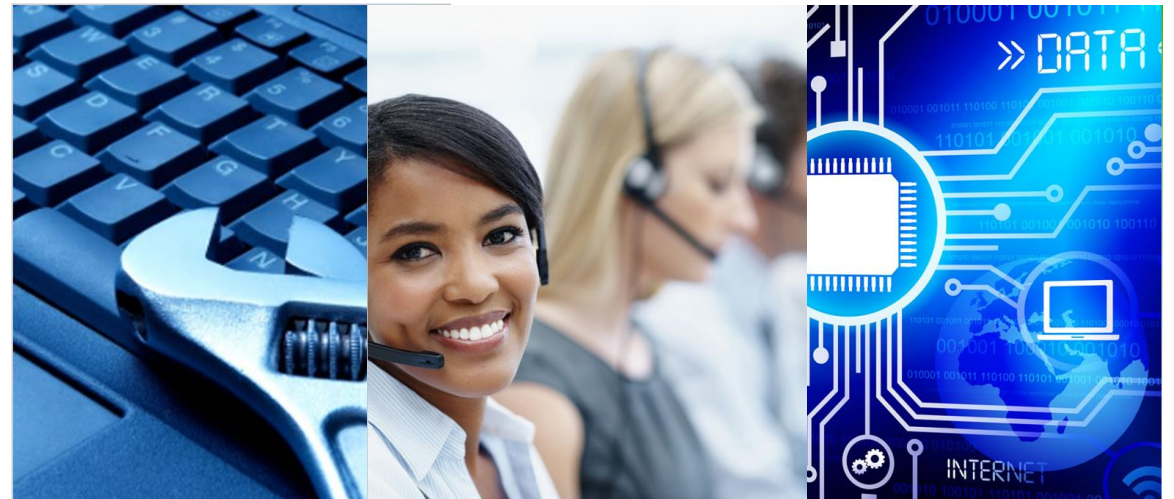


Selection of Digital Tools

Planning Challenges

- Will the utility map the impacts and effects of implementing the new tools?
- Will the utility identify and commit to providing the resources required for the organization to make effective use of the new tools?

“It is common for utilities to discover workflows that will be impacted when they are already in the middle of a software implementation project “



Selection of Digital Tools

Lessons Learned



- Define the problems you are trying to solve
- Seek input from across the organization
- Assess the preparedness of staff to use new tools
- Implement a structured process for mapping what already exists and consider the potential impact of any new digital tool
- Create a realistic business case that considers not only the cost of the tool, but the investments that will be needed for the organization to fully utilize the tool

Selection of Tools: Possible Next Steps

Preparedness Checklist/How To Guide to help utilities evaluate their digital preparedness (e.g., ability to analyze current work processes and potential modifications, staff digital and maintenance skills, and organizational culture)

Mapping what digital tools already exists



Case Study – Ross Valley Sanitary District

RVSD – 34 Employees
196 Miles of Pipe
19 Pump and Lift Stations

Enterprise Asset Management System – Onboarding 2012

Issue – Cease and Assist Order

Needed to understand asset registry – what we owned, what needed maintenance.

EAMS – that would help you organize your assets and understand what you were working with.

Skills

Management – Authorizations – Create the workflows based on previous work acted on

Supervisors – Permissions – QA, QC, run reports, schedule work-flows

Field Workers – Data Entry

Buy In for need of Digital System

Taking small steps – make sure you have SOPs, competency-based training system. Train and assess field workers. Supervisors considered SME's, and Management oversaw the implementation – Still going on to this day.

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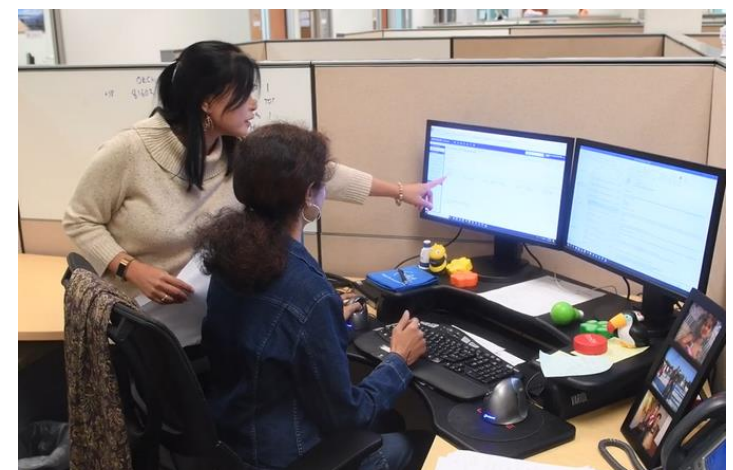
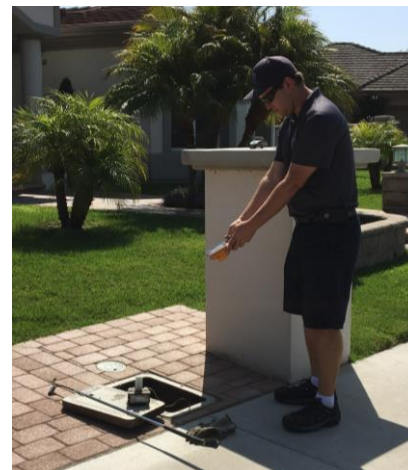
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Organizational Culture

Challenges

- In situations where organizational culture does not support innovation, continuous learning, or accountability, successful implementation of new digital tools can be difficult.
- Employees are often concerned that digital tools will replace them and/or radically modify the way they will need to perform their work.

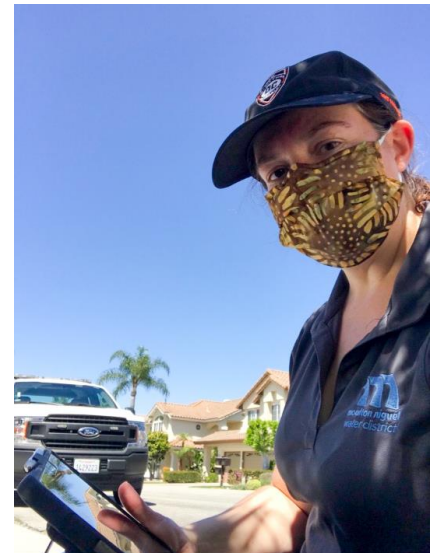


Organizational Culture

Lessons Learned

- Organizational cultures conducive to innovation have open communication, are supportive, respectful, and exhibit both a willingness to listen and a willingness to learn.
- Digital tools don't solve problems with organizational culture; only people can.

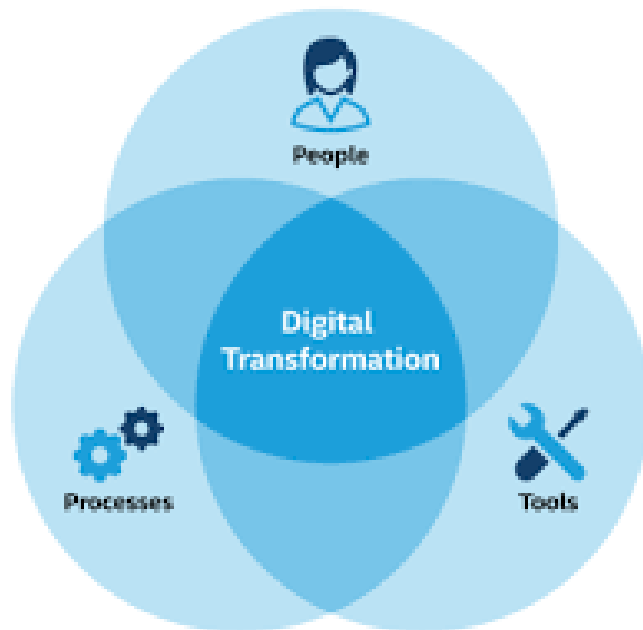
“The greatest factor is trust--of management, vendors, consultants, colleagues, and trust in their own abilities.”



Organizational Culture

Possible Next Steps

Workshops, webinars, and publications (with case studies showing strategies for change) could be provided on how organizational culture impacts the ability of organizations to make effective use of digital tools.



Initial and Ongoing Training

Challenges

- Training on use of digital tools is not a one-time or one-size-fits-all effort.
- Current training programs inadequate and out of date. Utilities under-estimate the training time and investment required.
- Internal training capacity is often limited.



Initial and Ongoing Training

Lessons Learned



- Some staff members will pick up how to use the tool much more quickly than others. Utilities should define power users who can serve as trainers, guides, and mentors for their peers.
- Research is needed on how best-in-class utilities and other industries provide staff training more effectively (e.g., through on-line access to training materials, digital twins, video-game-like learning tools, and mentoring)
- Address training barriers (e.g., union agreements and organizational culture)

Initial and Ongoing Staff Training

Possible Next Steps

- Provide more guidance to utilities on the digital and maintenance skills required in order to use and maintain software, hardware, and data collection instruments associated with different digital tools
- Conduct competency analysis of mission-critical job to identify the digital tools staff must be able to use in order to perform their work effectively
- Provide more assistance to utilities in development of training programs required, partner with educational institutions



Digital Competency Analysis Project (JVS)

- What type of digital tools do workers in different job categories need to be able to use?
- What core reading, math, science, and analytical skills do they need in order to use the tools?
- What kind of training does the utility need to be prepared to offer?
- What training is available in the community on both core skills and tool-specific information?



Candidate Development

Challenge

- Common perceptions of the knowledge and skills required by mission-critical workers are out-of-date and do not reflect the need for digital and technical maintenance skills.
- Educational resources in the community (unions, community colleges, and other training programs) may not provide training on the skills needed.



Candidate Development

Lesson Learned

Utilities should support technical training by providing on-site learning opportunities like internships and apprenticeships.



Candidate Development - Regional Apprenticeship

- BAYWORK is developing regional apprenticeship programs for the water sector, beginning with an Instrument Tech apprenticeship in January 2022
- Combining classroom and on-the-job training ensures that new candidates have the opportunity to learn the full range of digital skills needed in their trade



Candidate Development

Possible Next Steps

- Provide support to utilities in upgrading job descriptions and salaries
- Strengthen ability of utilities to help educational Institutions prepare qualified candidates
- Install internship programs so people in community college water programs can see the digital tools and learn how utilities utilize them
- Identify utilities with apprenticeship programs to learn from each other



Next Steps

Next Steps for The Digital Worker Initiative

Advisory Members Participated in two sessions to discuss possible next steps that others could use as a resource.

The product of those discussions is an attachment that has a list of ideas:

- National Level Collaboration
- Regional Level Collaboration
- Agency Level Collaboration

Effective use of digital tools is a major challenge and responsibility of the water industry. BAYWORK hopes that the ideas offered by Advisory Group members will contribute to a broad expansion of the level of effort and attention that the water industry brings to this work.

Share what Shane and I are doing for a next step for us.

Contact and Questions

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Services of the San Francisco
Public Utilities Commission

