



Effective Use of Digital
Water Services

Course Description

Long Description

BAYWORK, a consortium of Bay Area water/wastewater utilities collaborating to support workforce reliability, published *The Digital Worker*, a how-to guide for utilities on making more effective use of digital tools to provide reliable water services. The guide covered: selection of digital tools, organizational culture, IT support, human resources issues, cyber-security, development of qualified candidates with digital skills, artificial intelligence, initial and ongoing staff training and coordination with existing systems and workflows. A useful glossary of terms and suggested next steps were also built into the *Digital Worker*.

This document, published by BAYWORK in 2021, provided a starting point for development of this on-line course designed to help utility managers and employees plan and implement successful digital water projects and make more effective use of the digital tools they already have. The course helps utilities become more familiar with the language of digital water, develop an increased understanding of the challenges to expect when taking on digital water projects, and identify steps they can take to ensure their digital projects are successful. Learning objectives reflect the lessons learned identified by the Advisory Committee members from utilities, professional associations, and consultants from the United States and Canada who contributed to BAYWORK's *Digital Worker* Project.

The target audience includes the types of organizations that contributed to *The Digital Worker* (utilities, professionals associations, and consultants with expertise in implementation and use of digital systems), along with two other important groups: companies that produce software and hardware and educators who prepare their students to use digital tools. The course, like the *Digital Worker* White Paper, is understandable to a non-technical audience. Within water and wastewater utilities, digital tools are relevant across multiple departments (e.g., customer service, operations and maintenance of assets, finance, human resources, and IT) and multiple levels (managers, project planners, digital tool users, and departmental stakeholders). The topic is relevant and of increasing interest in every region of the US and also internationally.

Short Description

The *Effective Use of Digital Tools to Deliver Water Services* course helps utility managers and employees plan and implement successful digital water projects and make more effective use of the digital tools they already have. The course familiarizes utilities with the language of digital water, develops an increased understanding of the challenges to expect when taking on digital water projects and identifies what steps utilities should take to help ensure the success of their digital projects.

Blurb

What You Need to Know in Order to Make Better Use of Digital Tools

Store Category (Bold any that apply):

- Consumer & Youth Education
- **Distribution & Infrastructure**
- **Engineering & Construction**
- **Operator Certification & Training**
- **Safety & Security**
- Small Systems
- **Utility Management & Leadership**
- Wastewater
- **Water Quality & Treatment**
- **Water Resources**
- Stormwater

Needs Assessment

Although digital tools are not new to the water sector, the alternatives available are becoming more numerous and more complex. Many utilities have struggled with information system projects that fall short of their intended outcomes for a variety of reasons that reflect unfamiliarity, lack of preparedness and misalignment of efforts among different groups within their organizations. These challenges can result in wasted resources, change fatigue, and in some cases risks to water and wastewater operations reliability. Digital capability and competency are increasingly being seen as potential solutions to the demand for utilities to deliver higher quality and more affordable services, while managing workforce challenges that have emerged in the wake of the COVID-19 pandemic. **The *Effective Use of Digital Tools* course helps utilities develop their digital capabilities by better understanding common challenges, how peer organizations have been able to**



overcome them,
and the capacity-
required in their

building that may be
own organizations to make more effective use of digital tools.

Course Level (Bold level):

- Basic
- Intermediate
- Advanced

Store Image:

Please provide an image to represent the course in the AWWA store (separately or add here)



Development Team:

Please provide the first name, last name, company name and contact information for all members who will participate in this eLearning development team.

Name: Cheryl Davis (CKD Consulting)

Contact info: ckd@cherylkdavis.com, (510) 910-2986

Name: Catherine Curtis (BAYWORK and San Francisco Public Utilities Commission)

Contact info: ccurtis@sfwater.org, (415) 986-9084

Name: Sharon Peters (EMA Inc.)

Contact info: speters@ema-inc.com, (604) 87-4669



eLearning Course Title: Effective Use of Digital Tools to Deliver Water Services		
eLearning Course Learning Objectives (4-5): As a result of this course participants will be able to: 1. Discuss the concept of digital preparedness, identifying factors that affect a utility's ability to successfully select and implement digital tools that will work for them 2. Identify components of organizational culture that have an impact on an organization's ability to implement digital tools effectively 3. Recognize that cyber-security can't be guaranteed by IT staff alone, but requires support from all business units and employees 4. Identify areas where changes to past human resource practices and frameworks may be needed for effective implementation of digital tools 5. Identify short and long-term business costs in order to build a realistic business case for selection and implementation of digital tools 6. Discuss both short and long-term strategies for training staff to use digital tools; and 7. Discuss utility strategies for helping develop candidates who have the digital skills required for mission-critical jobs.		
Module 1 Title: Introduction to the Effective Use of Digital Tools		
Agenda Topic	Learning Objectives As a result of this module participants will be able to:	Activity (Check for Understanding, or critical thinking scenario?)
Digital Tools	1. Recognize a description of digital tools consistent with the definition used for the purpose of this course	Multiple choice test Response will be checked
The Digital Worker	2. Realize that staff in all water utility jobs are digital workers although they may be using different kinds of digital tools	Select one or more categories of tools that a water treatment operator or wastewater treatment operator might need to use in their work all possibilities shown on the list would be correct
Digital Challenges	3. Recognize challenges associated with effective selection and use of digital tools	Identify challenges from a pre-defined list. All but one would be real challenges identified previously in the text
Digital Preparedness	4. Explain why digital preparedness on the part of a utility is as key to success as the attributes of the digital tools used	Identify areas where inadequate preparedness on the part of a utility could impair the utility's ability to implement a digital tool successfully All but one item on the list would be real challenges identified previously in the text
Module 2 Title: Selection of Digital Tools		
Agenda Topic	Learning Objectives	Activity
Understanding the problem	1. Identify potential difficulties that can result from failure to carefully define the problems that the organization hopes to solve through use of a new digital tool	Select possible effects of failing to carefully define the problem from a pre-defined list. One list entry would reference use of AI tools



ELEARNING DESIGN PLAN

		Response would be assessed to make sure the student selected at least three items from the list
	2. Select a reliable process for incorporating consideration of cybersecurity implications into selection and implementation of a new digital tool	Ask student to select the better of the two following processes: Alternative 1 Select the best tool to meet operational needs Install the tool Identify and resolve possible cybersecurity risks Alternative 2 Identify possible cybersecurity risks during the tool selection process through joint analysis by operations and IT staff Consider cyber-security in the selection of the tool Define cyber-security mitigation measures as part of the implementation plan if special or new measures are needed Student would need to select the correct order of events (No 2 above)
Employee involvement	3. Suggest business units and job categories that should be included in selection of a particular category of digital tool	A list of categories of different types of digital tools would be provided, as well as a list of different types of business units (operational, HR, IT, and finance). Students would be asked to select a type of business tool and select as many business units as they think might need to be involved in selection of the tool. For any type of tool, it would be ok to list all possible business units.
Building a business case	4. Identify not only initial but also long-term costs that could be associated with implementation of a new digital tool	Provide a list where the test-taker can identify multiple possible long-



ELEARNING DESIGN PLAN

		term costs that should be taken into consideration All options other than one would be correct to check.
Module 3: Coordination with Existing Workflows and Systems		
Agenda Topic	Learning Objectives	Activity
Mapping existing systems and workflows relative to new tools under consideration	1. Explain the importance of assessing the potential impacts of new processes and tools that are under consideration on existing work processes and digital tools	Identify possible negative outcomes of failure to predict actual costs Student would check items on a pre-defined list) e.g. a new system adopted for use by one work unit could affect the work of a downstream operational activity or funding might not be available for development of training materials
Module 4 Title: Organizational Culture		
Agenda Topic	Learning Objectives As a result of this module participants will be able to:	Activity (Check for Understanding, or critical thinking scenario?)
Organizational culture	1. Recognize the definition of "organizational culture" as it is used in this course.	Multiple choice test on definition of organizational culture
The impact of organizational culture on effective use of digital tools	2. Describe the attributes of organizational culture that have an effect on an organization's ability to make effective use of digital tools	Select items on a pre-defined list of organizational culture attributes that have an effect on an organization's ability to make effective use of digital tools Would have to select some but ideally would select all items on a list that includes the topics identified in the script
Module 5 Title: Human Resources Issues		
Agenda Topic	Learning Objectives	Activity
Modification of job classifications	1. Explain the importance of modifying job descriptions to match the digital skills needed in existing jobs	Student to select from pre-identified list of aspects of HR work that might need to be modified (e.g., job classifications, salaries, recruitment processes, creation of new job categories) One item on the list would be an incorrect response
Creation of Job classifications	2. Recognize the importance of creating new job classifications as needed to support new digital tools	Yes or no response



ELEARNING DESIGN PLAN

		Have you ever observed a situation where utility implementation of a new digital system created a need for a new job classification? If yes, please provide a brief example.
Recruitment of applicants with digital skills	3. Recognize that the need to recruit staff with digital skills could require changes to salaries and recruitment practices	Select (from a pre-defined list) changes utilities might need to make in order to successfully recruit individuals with needed digital skills Any answer selected would be ok, they would just need to select at least one
Definition of Digital HR Strategies	4. Recognize the need for operations and IT staff to collaborate with HR staff to develop new HR strategies and resources to address HR needs associated with effective implementation of digital tools	Student to answer question: Do you see a need for operations, IT, and Human Resources staff in utilities to work together to help make sure the utility has staff with the digital skills required? If yes, do you have any suggestions for issues that should be addressed in a Digital HR Strategy?
Module 6: Information Technology Support		
Agenda Topic	Learning Objectives	Activity
IT/Operations Collaboration	1. Discuss the importance of collaboration between IT and operational staff in the selection and implementation of digital tools	Give an example of an area where operational staff and IT staff need to work together in selection or implementation of digital tools
Access to adequate IT Support	2. Describe the importance of ensuring that operational staff have access to technical support from IT professionals who have sufficient relevant expertise to support current operational systems as well as emerging technologies (e.g., artificial intelligence) and growing concerns (e.g., cybersecurity)	Identify (checking items from a list) conditions that can prevent utility staff from receiving the type and quality of IT support they need
Module 7 Title: Initial and Ongoing Staff Training		
Agenda Topic	Learning Objectives As a result of this module participants will be able to:	Activity (Check for Understanding, or critical thinking scenario?)
Planning and delivering effective training	1. Discuss why both initial training and continuing access to training are required on digital tools implemented by the organization	Discuss why a one-time training on use of a digital tool may not be sufficient for implementation of a new digital tools



ELEARNING DESIGN PLAN

	2. Recognize a variety of options for providing staff training and mentoring	Student to check various alternatives on a pre-defined list
Collaborating with other organizations and industries	3. Explain the value of collaboration among utilities and learning from other industries to improve the quality of digital training offered to staff	Provide a suggestion on how utilities might be able to learn from each other or other industries to improve their use of digital tools
Cybersecurity training	4. Identify risks associated with failure to provide appropriate types of cybersecurity training to employees in all business units and at all levels of the organization	Student to check appropriate items on a pre-defined list of possible risks associated with inadequate cybersecurity protection
Module 8 Title: Developing Qualified Candidates for Digital Jobs		
Agenda Topic	Learning Objectives	Activity
Collaborating with educational and community partners	1. Describe potential opportunities for collaboration with educational and community partners to develop qualified candidates	Check relevant items from a list that includes site visits for students to utilities, presentations by utility staff to students, internships, pre-apprenticeships, and apprenticeships All answers would be correct.
Recruitment challenges	Explain some of the challenges related to developing and recruiting qualified candidates who have digital skills related to the tools used to perform business and technical tasks	Please identify one challenge that utilities encounter in recruiting staff with the digital skills required for effective use of digital tools.