

Operational Asset Management

ROUNDTABLE

AWWA Asset Management Committee



Key Takeaways

At ACE19, AWWA's Asset Management Subcommittee led a session on operational asset management titled the "Gamification of Asset Management."

Participants discussed the different stages of maturity utilities face in developing their programs and how using sports terminology can help utilities form a better game plan and team-centered approach.

A challenging aspect of asset management is ensuring there is on-the-ground acceptance, interdepartmental coordination, and good data that can measure results.

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Introduction by Peter Kraft

The “gamification of asset management” consists of concepts that have grown organically over the past four years and now encompass insight from many utility leaders across the industry. The basic premise bridges a few themes that all center on the engagement of the workforce, or “players on the field.” Its origin started at a water utility, where I was trying to build the asset management program and interpret industry asset management frameworks. I attempted to apply their frameworks to the utility’s operations and maintenance (O&M) department and supporting technology. I found during this experience that though there were many excellent questions and ideas presented within these frameworks, the language and concepts used were not something I could easily translate and apply to my engagement with the field and plant staff. In particular, when thinking about strategic drivers and levels of service (LOS), I often found myself scratching my head as to how this could easily be incorporated into the daily work and application of technology for the workforce.

As I worked more closely with the field and plant staff, I learned there was a great deal of knowledge and insight to be gained that was not captured in our process. A better bridge was needed to explain not only how the

value of asset management extended to and benefited the workforce, but also how staff could feel empowered—how they could be engaged and acknowledged as the foundation and backbone of the program. Without their daily effort, there was no game to be played. This is the challenge many utilities face: how to create a seamless bridge of asset management policies and strategies to daily work activities of the field and plant staff. This applies not only to standard procedures and data collection practices that help feed and drive decisions but also to recognizing the workforce as the foundation of it all.

In talking with many other colleagues across the industry, I discovered they faced a similar challenge. This is when the idea was sparked to build on existing asset management frameworks and come up with new ways for the core principles of asset management to be communicated and more easily adopted and translated to the workforce. To apply this to the “gamification” concept (Figure 1), the framework was built for not only the “coaches,” but also the “players.”

The timing of this realization fortuitously lined up with events at AWWA’s Annual Conference & Exposition (ACE) in 2018, where the AWWA Asset Management Committee (which consists of more than 140 utility/industry professionals) announced results

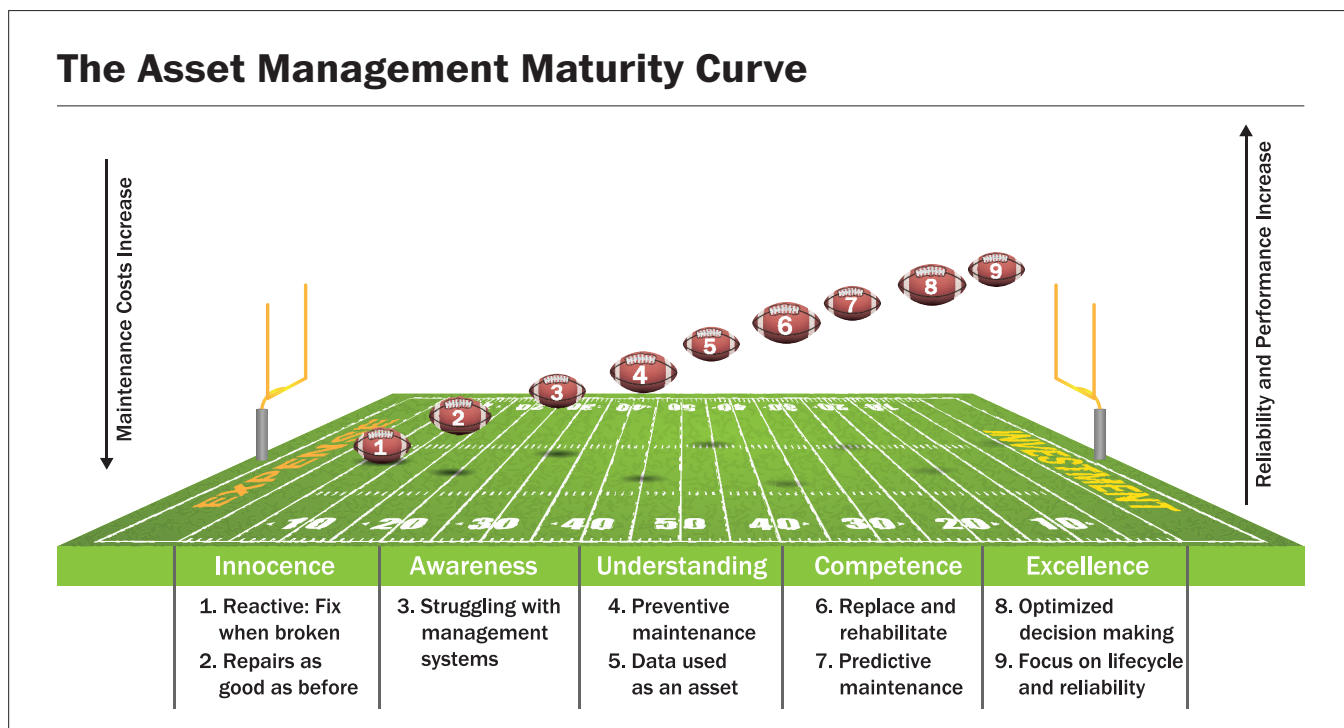


Figure 1

from a survey it administered on what issues and needs are most pressing. Aligning asset management with O&M to improve proactive maintenance strategies and optimize processes was at the top of the list. I volunteered to chair this committee and saw it as an excellent opportunity to engage and collaborate with other AM and utility leaders about their experiences in more detail. The subcommittee we organized was made up of directors, superintendents, and asset managers from East Bay Municipal Utility District (EBMUD), Denver Water, Metropolitan Water District (MWD), Aqua America, City of Henderson, and Contra Costa. The group took a strong interest in “the gamification of asset management” concept and quickly drew up a framework for tackling AM priorities using “game-speak” (i.e., drawing inspiration from sports) to walk through the maturity stages of asset management (Figure 1). The outcome of this subcommittee effort has resulted in a great deal of collaboration and industry exposure. The subcommittee’s presentation at ACE19 was well received and has led to plans for future ACE preconference workshops. What follows is our conversation from ACE19 on the “gamification of asset management.” This is the first of a two-part series that documents the journey from “innocence” to “excellence” on the AM maturity curve shown in Figure 1.

This first discussion focuses on the first half of the AM maturity curve: innocence to understanding. A future article will focus on the second half of the curve: understanding to excellence. The roundtable participants are Clifford Chan (EBMUD), John Day (City of Henderson), Pete Schoemann (Contra Costa Water District), Justin Kauffman (Aqua America), Kevin Campanella (Burgess & Niple), Kurt Vause (Streamline AM), Kevin Slaven (Arcadis), and Sergio Escalante (MWD). To get the panelists started, I posed framing questions to the group.

Editor’s note: The transcript of the roundtable discussion that follows has been edited for length and clarity.

Key Points to Ensure Successful Operational Asset Management



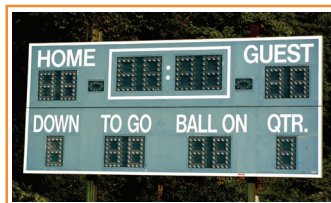
Starting the Conversation

- Understand who is on the team
- Determine what their roles and responsibilities are
- Develop a common language to talk about the game
- Define clear goals and a sense of purpose



Moving the Ball Down the Field

- Put the plan into action
- Try different approaches
- Coordinate between players
- Begin to measure progress



Putting Points on the Board

- Define what success looks like for the team
- Select metrics that align with the organization’s goals
- Make sure the value and results are visible and understood by all

Figure 2

Starting the Conversation

Before a team can perform effectively on the field, the players need to have a common understanding of their roles and responsibilities as well as what they are aiming to achieve (Figure 2). Before joining the roundtable discussion, participants approached their own utilities and engaged in a conversation about where they believed their organization fell on the AM maturity curve.

Framing Questions

- For utilities that are new to asset management practices as well as those that have had a program for years, how should you advance asset management within your utility?
- As you start conversations with different staff groups, do you find utility employees understand asset management and how the utility addresses it?
- Why do differences appear between some of these staff groups, and what can be done to bridge these gaps and create better alignment?

Chan: If you ask different people, “What do you think asset management is?” the answer will vary depending on whom you ask. Field staff tend to think of asset management in terms of preventive maintenance (PM), corrective maintenance (CM), and predictive maintenance (PdM). A supervisor has a broader view of asset management. Management’s perspective depends on the maturity of the organization. Some think of asset management from a risk-based and level-of-service perspective. Others think their computerized maintenance management system (CMMS) is asset management.

We need to reinforce the idea that asset management is something that evolves over time, not something that is a “project” with a fixed beginning and end.

You (the organization or utility) need to build your team. Historically, asset management has been managed in the O&M group. We need to redefine that. Asset management is not just O&M. It’s also engineering, finance, and information technology (IT). Everybody has a role in the utility’s asset management program.

At EBMUD, we’ve made a big push with our pipeline replacement. We’ve brought O&M and engineering together—literally. The maintenance staff sit side-by-side with the engineering staff and they work together to solve problems and design projects. We have matured to having a strong team effort and atmosphere. Our pipeline replacement program is called Pipeline Rebuild. Everything we’re doing is about rebuilding.

Kraft: So that was a cultural change?

Chan: Yes. East Bay MUD has been talking about change management for the past few years. To push this initiative through we need to identify leaders we call “change champions.”

On another front, good data are critical to making good capital investment and maintenance decisions. We routinely check the data in the work orders, and our asset management group has monthly meetings with the maintenance supervisors to discuss what is and isn’t working. We meet with staff and let them how we’re using

the data. The feedback loop is necessary to make sure we all understand how the data are collected and used.

Day: I believe you get different levels of asset management understanding depending on whom you ask.

- **O&M staff.** Focus on work orders for PM, CM, or PdM; in our case, most operators or technicians believe asset management is our CMMS (Maximo).
- **Supervisory level.** Most see the results as justification for additional resources.
- **Management level.** Levels of engagement or understanding vary depending on who owns the asset. Some managers have seen the result of increased funding to address PdM needs or increased redundancy in design, while others have struggled to see the value in a CMMS.

To help the conversation, we’ve made some organizational changes and put a diverse group under one umbrella. Definitions and language around asset management still need better understanding even at the management level.

Schoemann: At Contra Costa Water District (CCWD), senior management has a better understanding of asset management than other levels of staff. At the supervisor level and below, the understanding varies widely. Some field staff view it as a “management thing,” or think it is something just for work orders, such as for data collection and preventative maintenance tasks. Supervisors tend to have a better idea of what asset management is and why it’s important to have a CMMS to collect and store data on what it takes to maintain a system of our size and how staff are spending their time in the field.

Our asset management implementation began about two years ago. Prior to these efforts, the asset management program was not comprehensive but rather siloed in different departments and systems around the organization. Like most utilities, we have master planning studies for all our facilities in support of investment prioritization in the capital improvement program (CIP). Engineering staff developed projects from the CIP and implemented them. Our finance group mostly dealt with assets from a financial reporting perspective. To resolve these different approaches, a comprehensive asset management implementation plan was developed and it really helped to jump-start the conversations internally on gaps in our program, the need for a comprehensive CMMS, and better interdepartmental coordination.

Kauffman: When asking about asset management, I get a lot of bewildered looks. Having people understand asset management and work together as a team is a challenge.

Operations and engineering groups often do their own things and stay in their own departments. A key change is the language we use; when talking about asset management, we need to get everyone on the same page.

Kraft: I've found that providing a broader context and meaning as part of the communications can help too. We're now 60–70 years post–baby boomer growth, which means we must focus on managing the aging infrastructure that was installed at that time. That is at the heart of asset management for a lot of cities: how do we manage what we have? Describing the purpose of asset management through the story of the city or community helps translate the value of asset management and how it is intricately connected to both immediate and long-term planning.

Day: We were very focused on tremendous growth through the 1980s, 1990s, and 2000s. A lot of assets with a lot of value were added in a short period of time. A wave of renewal is coming, and we need to be prepared to address the financial implications.

Campanella: Particularly for larger programs, a charter may be part of the asset management program. The charter states what the organization wants to achieve—like a mission statement—and contains a change management component.

The idea of advancing asset management practice within the utility setting is a change management challenge to most people. We need to reinforce the idea that asset management is something that evolves over time, not something that is a “project” with a fixed beginning and end.

Vause: Knowledge—there isn't one recipe everybody can look to. It's hard to know what steps to take next. Decisions about asset management that you initiate don't typically come from a book, a recipe, or a mandate; it's typically because it's what you believe is the next best thing.

At our utility, we started the conversation with the executives, then the “leaders of change” group (all the supervisors around the utility). We discussed the necessity to become better and fix our serious structural challenges. We worked with the leaders of change to understand and embrace the vision. Not everyone caught the vision (some retired). The remaining supervisors took responsibility to advance our practices by working with individual work groups.

Our former mechanical electrical supervisor said, “talk to these people individually in work units one-on-one to find out what challenges they face and help them solve

one problem to make their life better.” If you do that from the work group level down to the line staff, you'll have an internal champion. They'll have seen the benefit of what you have been talking about and become your advocate. And that is what we did (in our case, for a sewer line cleaner). Starting the conversation by working one-on-one with an individual—we found that approach to have the biggest success with trying to advance asset management concepts.

Kraft: Sitting in the boardroom, how do we, as organizations, continually improve our confidence and objectivity over time if we don't have a solid grasp and strategy around the people, processes, and systems supporting the collection of asset and work data? Herein lies the need and dependency connecting back to the people collecting the data. They serve as the most important piece of the picture and are often not part of the picture at all.

Campanella: Collecting the right/better data for asset management processes is not necessarily a benefit to the personnel collecting the data, at least not right away, even if the data will ultimately help staff down the road. Helping field staff understand that is a challenge, and

Another key element of asset management advancement is making sure staff understands the “why.”

providing an explanation of how data will be used goes a long way toward making sure the right data are collected. Also, mental toughness (i.e., persistence) is needed to succeed, and the chances of success go up greatly if the players understand how and why they are helping to improve the overall utility.

Moving the Ball Down the Field

After the team and roles are defined, the next step is to start “making plays.”

Framing Questions

- Once the conversation about asset management has started, the next step is identifying some initial plays to keep things moving forward. What does that look like in terms of people, processes, data, and tools?
- What were some of the initial steps that you put into action at your utility to keep momentum?

Chan: You need to start talking about the idea of risk. Not right away, but the concept needs to be introduced. People at early levels of sophistication need to understand risk in terms of their day-to-day work and how it intersects with what needs to get done. As you mature along the awareness-understanding curve, people will understand how we look at risk in terms of asset management.

The data are important, but sometimes we try to have perfect data even though it's possible to make good decisions based on imperfect data. Don't make *perfect* the enemy of *good*. With a large amount of data, you start

create value in the day-to-day work for the supervisors. Otherwise, it will be hard to get traction and buy-in for a sustainable program. Without creating value, field data won't be captured, and we won't make progress.

Another challenge we realized is the effect of the "silver tsunami." Long-tenured employees have a wealth of asset knowledge, like meter technicians who know where 5,000 meters are located because they have done the route for decades. But when those technicians retire, that information is lost. Within our asset program, we're trying to educate staff on the value of a CMMS and the knowledge transfer aspect by storing information in the system.

Campanella: As an initial step, we formed several teams with a diagonal slice through the organization. We created teams with a diversity of disciplines and levels (from the front line to the managers). We had engineering, maintenance, operations, management, IT, and customer service in the same groups. The hope was that their discussions would then spread across the disciplines.

Slaven: Putting points on the board at an early stage can also be about better understanding what you don't know. Have you done a gap assessment? Have you benchmarked yourself? Take a step back and, with everyone in the room, look for gaps across people, processes, and technology (using a gap or International Organization of Standardization assessment). Determine gaps that need to be filled to "move the ball." Identify the quick wins to create momentum and get buy-in for bigger improvements, the idea being to understand what the utility looks like as an organization before getting on the field.

Putting Points on the Board

After taking action, it's important to measure progress and ensure results are visible by everyone in the organization.

Framing Questions

- When you have the team together and are starting to develop a playbook, how do you start to measure and show progress?
- What does progress mean to you and your experience at your utility?

Chan: Improving your numbers (i.e., performance) is important, but more importantly, you need to consider cultural change. Management needs to be aware of the conversations. Are people changing? Are they comfortable with the changes? Are people blaming each other for issues, or are they working together to accomplish the goals? You need to be tuned in to how the culture is forming/evolving. You can't really measure it, but you

You need to be careful with metrics. You don't want to focus on achieving the metric if it results in bad decisions being made.

to see trends. Take all the data you have and combine it with anecdotal information from your staff. Look for patterns in that information and then you can find where you need to start.

Day: By introducing the idea of risk and collecting enough data in our CMMS, it shows that preventive maintenance and equipment refreshes could drive down the costs of corrective maintenance. The consequence and impact of the heating, ventilation, and air conditioning system going down and affecting sensitive control systems is a strong example of why introducing the concept of risk is important.

Schoemann: To keep moving along the asset management curve, roles and responsibilities need to be clearly defined. Simply relying on institutional knowledge for a large and complex water system is not sustainable. To address this problem at our utility, we developed a more comprehensive asset management responsibility matrix for each facility that clearly defines the roles and responsibilities. By our doing so, better ownership was developed for the facilities, maintenance standards and budgeting were more consistently applied, and investment prioritization was discussed with the appropriate stakeholders.

Another key element of asset management advancement is making sure staff understand the "why." First off, asset management needs to create value for the supervisors. It can't be looked at as a collateral duty. It's got to

need to sense it/be aware of it as a manager. You don't want tension or silos.

For pipe replacement, we set a goal a few years ago of 15 miles, then we hit 15 miles. The metric was great, but it was tough to meet that goal because people didn't always work together as well as they could have. Each pipeline crew had its individual goal. The second year we created a common goal of 17.5 miles and took away the individual goals, and the culture and teamwork were significantly better. Everyone worked together to meet the overall goal. You need to be careful with metrics. You don't want to focus on achieving the metric if it results in bad decisions being made.

Escalante: It's not about chasing numbers, and one number doesn't mean anything. More important is to look at the aggregate and the pattern of the numbers.

Day: There is the combination of the metrics that you need to get perspective on. What is that number that we're looking for that really defines what our organization is trying to achieve? I envision some type of score card or dashboard of metrics or key performance indicators that provide a better picture of asset or organizational health.

Schoemann: It starts with having some metrics, and it depends on where you are on the maturity curve. Your metrics should be reflective of where you are on the curve. Metrics could be basic (e.g., CMMS utilization, percent time captured in work orders, PM backlog). More advanced metrics can and should be developed as your asset management program and field data collection mature and grow. At CCWD, we started with basic utilization metrics such as collecting data and building out a logical and user-friendly asset registry and hierarchy.

At CCWD, there's a tendency for senior management, without a good understanding of where we are on the maturity curve, to jump ahead and push for more sophisticated metrics to measure staff productivity and efficiency without having adequate data to support it. The challenge is aligning expectations on metrics with the reality of where your organization is on the maturity curve. More advanced metrics will come in time and be more meaningful once the data exist to support their development.

Vause: We wanted to get into metrics quickly and be able to document our improved performance, but the effort failed miserably on many fronts. We were desperate and didn't have a planner/scheduler but didn't hire one for political reasons. Our new and young O&M

director bought a huge flat-screen television that displayed our outstanding work orders. This was the "wall of shame" for everyone to see, and it helped people question why we were doing things the way that we did them and notice the issues with our maintenance program. This was a way of qualitatively measuring our progress. The foremen didn't want their names on long-overdue work and began to improve, and they began to understand and see the purpose. ♦

About the Authors



Peter Kraft is the asset management practice lead at The Confluence Group, A Xylem Brand (www.confluencegroup.com), in Boulder, Colo.; peter@confluencegroup.com.

Clifford Chan is the director of operations and maintenance at East Bay Municipal Utility District (www.ebmud.com) in Oakland, Calif.; Clifford.chan@ebmud.com.

John Day is deputy director of asset management and engineering at the City of Henderson (cityofhenderson.com) in Henderson, Nev.; john.day@cityofhenderson.com.

Pete Schoemann is the director of operations and maintenance at Contra Costa Water (www.ccwater.com) in Contra Costa, Calif.; pschoemann@ccwater.com.

Justin Kauffman is the director of asset management and field services at Aqua America (www.aquaamerica.com) in Bryn Mawr, Pa.; Kauffman@aquaaamerica.com.

Kevin Campanella is the utilities practice lead at Burgess & Niple (www.burgessniple.com) in Columbus, Ohio; kevin.campanella@burgessniple.com.

Kurt Vause is the chair of the AWWA Asset Management Committee and principle of Streamline AM (www.streamlineam.com); kurtvause@streamlineam.com.

Kevin Slaven is the asset management practice lead at Arcadis (www.arcadis.com) in Cleveland, Ohio; slaven@arcadis.com.

Sergio Escalante is the deputy director of operations at Metropolitan Water District (mwdh2o.com) in Los Angeles, Calif.; sescalante@mwdh2o.com.

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