Top 10 Reasons to Love Your Modern PI Server

Including pro-tips and videos to learn why now is the time to upgrade!

OSIsoft®

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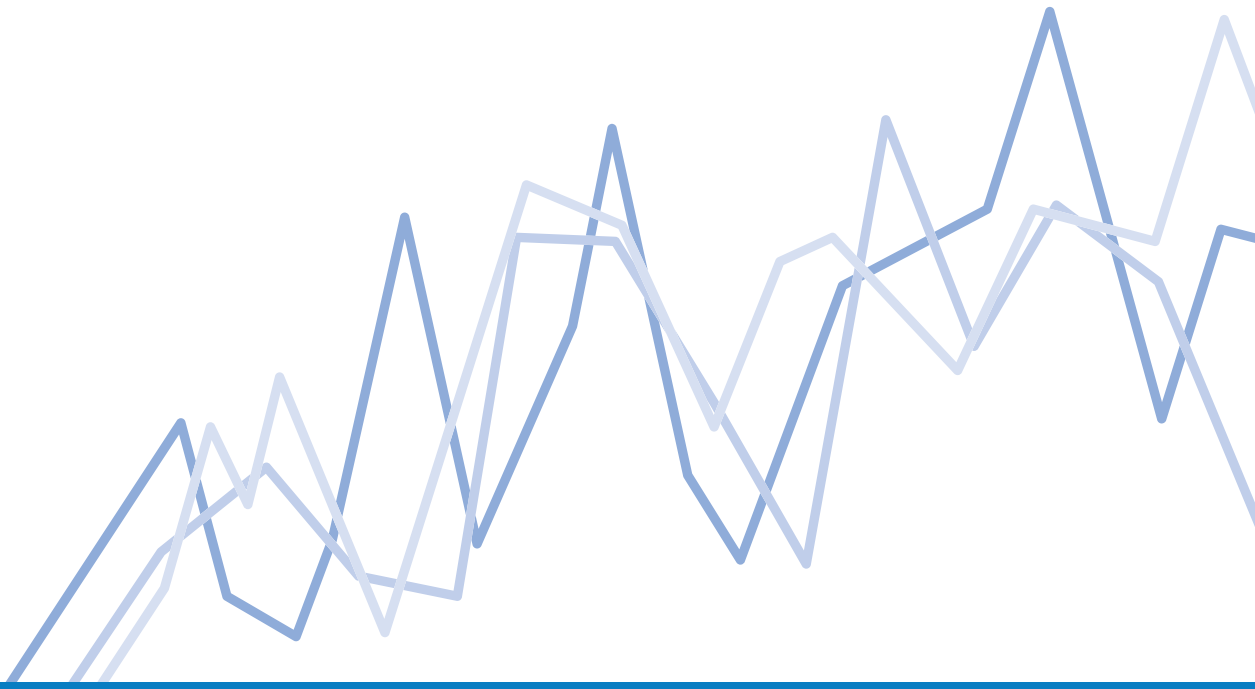
The modern PI Server has undergone many changes in the last few years. It all started with noticing a shift in customers' needs and the business landscape. There is more data coming from more assets distributed across more sites and more people who need to know, yet the number of hours in a day stays the same. You need information that is in context and readily consumable, all with a high degree of reliability and manageability. To meet your growing needs, OSIsoft embarked on a system-wide transformation to move beyond raw data and focus on integrating and delivering actionable information.

The modern PI Server is much more than just a historian. In addition to storing time-series data in the **PI Data Archive**, the PI Server also enables you to bridge across your assets and business databases with the inclusion of **PI Asset Framework**; calculate key performance indicators and aggregation metrics with **Asset Analytics**; auto-track key events and excursions with **event frames**; and do all this with out-of-the-box capabilities that can be leveraged within the integrated PI System infrastructure. Since 2012, every release has moved toward a vision of turning data into actionable information, and the 2015 release marks a breakthrough in this transformation.

We've listed ten of the most popular capabilities to help you and others in your organization discover why now is a great time to plan your upgrade. For all of you who have already upgraded, we've also provided a blend of pro-tips and learning videos to help you take full advantage of the most powerful PI Server to date.



1. Calculations on a server, not spreadsheets

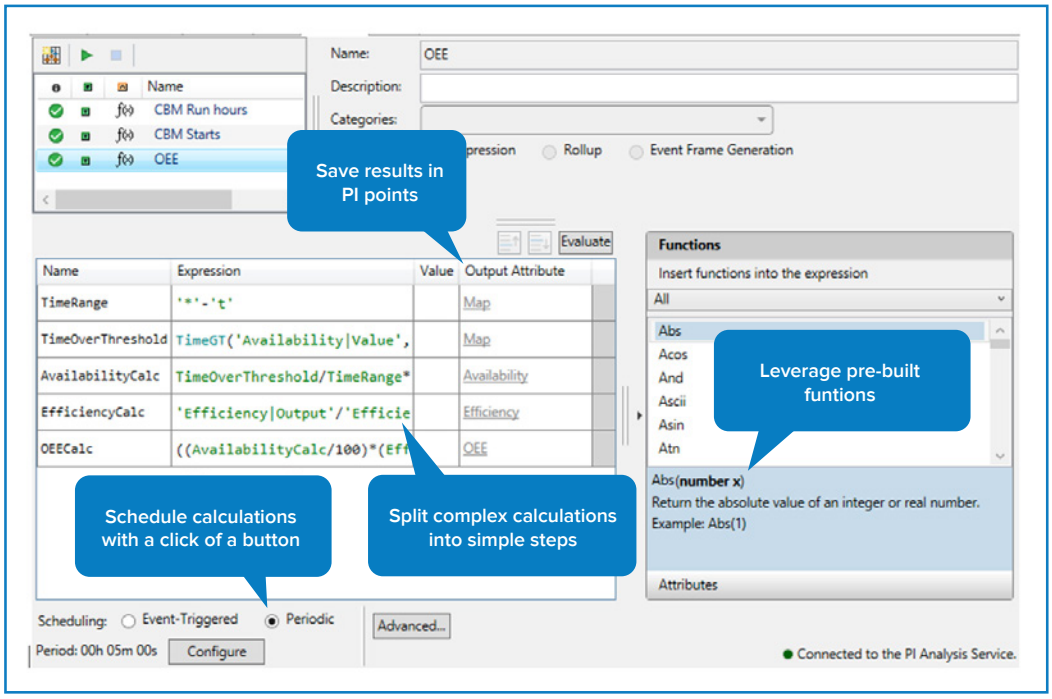
Asset Analytics, available with PI Asset Framework 2014

What is the overall efficiency of a particular process? Which facility had the highest average production last week? Last month?

Customers often run calculations on raw data to make key decisions such as which assets require maintenance, or to determine the profitability of a particular site. However, these calculations often reside in spreadsheets, with data ranges, methods, or errors as numerous as the individuals who maintain them. Asking one question can therefore lead to a range of different, and potentially contradictory, answers.

With Asset Analytics, you can easily configure server-side calculations with pre-built functions and Intellisense that will auto-populate suggestions as you type. Expressions can be basic, one-line calculations like the standard deviation of a voltage measurement, or multi-step calculations like the one shown below to determine overall equipment efficiency. Asset Analytics also provides a simple configuration option to write calculation results back to PI points on either a timed or events-driven schedule. All of this is possible with a no-coding-required UI and enables large-scale deployment of calculations that are more manageable and powerful than could be handled within a typical spreadsheet.

For those using Performance Equations, the same functionalities (and more!) are available in Asset Analytics where analyses can be easily deployed, backfilled, and managed at scale from a single UI.



A simple administrative tool for configuring analyses.

PRO TIP:

Use a named variable for numerical constants, and refer to the constant by name in subsequent calculations. For example, rather than wonder what 'Total Production'/28,800 means, set EightHourShift as 28800, and use the named variable for subsequent calculations. Now your calculation reads as 'Total Production'/'EightHourShift'. This is easier to follow and reduces the risk of mistakes.

This great pro tip came from one of our customers. Listen to him speak about overall equipment efficiency (OEE) and downtime reduction projects here.

2. Rapid, reliable deployment and asset-to-asset comparisons

Templates, PI Asset Framework

How long does it take to deploy a new asset and integrate it with existing displays? How easily can you tell whether the problem is due to a single bad actor, or if there is a larger pervasive issue with a certain equipment manufacturer or region?

The ability to reliably bring new units online or run asset-to-asset comparisons relies on standardization. These standards should be simple to implement, deploy, govern, and update from a central location. With PI Asset Framework, you can easily create a view of your asset with associated metadata that integrates and contextualizes data from multiple repositories, whether from the PI Data Archive or other business or maintenance systems. These asset associations can then be turned into a template that applies to other similar assets, so that every boiler, every pump, or every transformer has a reliable, consistent view.

Leveraging templates means that when you create a new efficiency calculation, that same calculation can be applied automatically, consistently to all units with the same template. If new sensors or a different maintenance database is added, these updates can be managed centrally, thereby reducing administration time and errors.

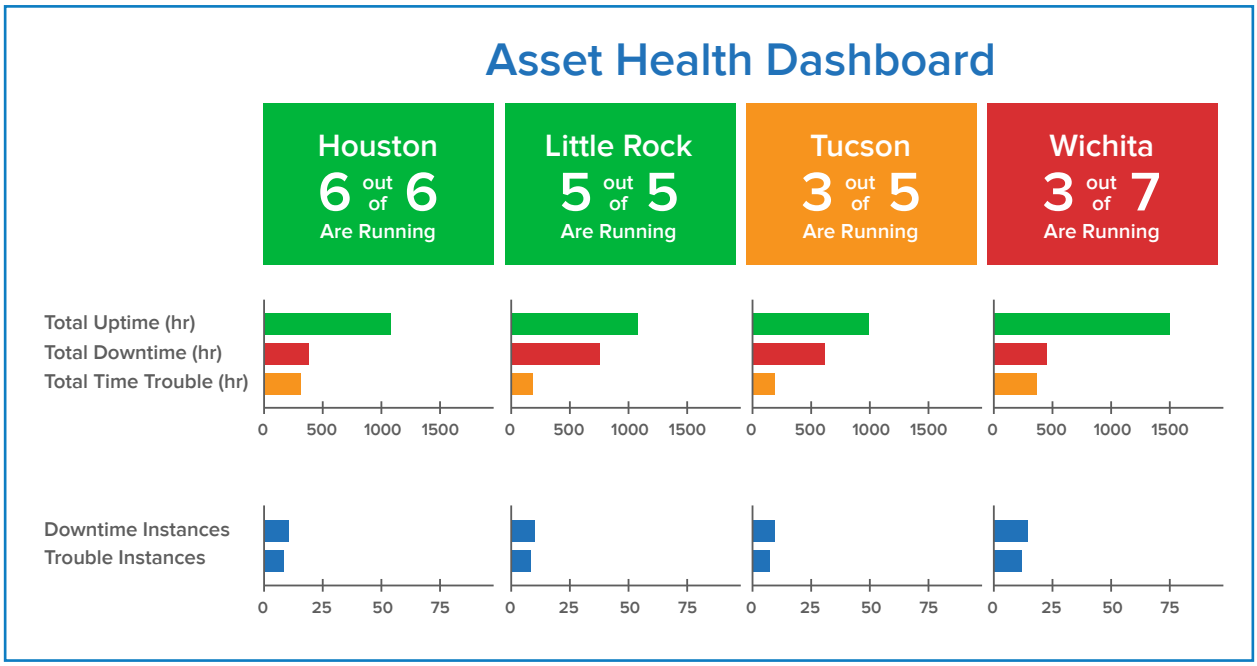
Read this summary to learn how a customer who has serviced roughly 3,000 megawatts of renewable energy is using templates to facilitate asset-monitoring of diverse turbines and to integrate data from new wind farms in a matter of hours instead of weeks. You can listen to the full presentation from the 2014 EMEA User's Conference.

3. Assess overall system health with aggregated KPIs

Roll-up Analysis, available with PI Asset Framework 2014

Can you tell the overall health of your process with a single glance?

With asset information in a consistent format, individual attributes can be aggregated across your assets or sites to create aggregate Key Performance Indicators (KPIs). As an example, you can configure a roll-up analysis within PI Asset Framework to roll-up each well's production to the site level for total production, or pull the energy consumption from every asset in a region to determine total energy cost. Newly added assets are incorporated into the roll-up automatically so that your KPIs stay up-to-date without intervention. Aggregate KPIs simplify your view so that you can spot trouble areas quickly and then drill down as needed.



PRO TIP:

PI AF allows you to organize the same data in multiple ways to enable different views, for example, by asset, geography, or process. Another trick is to consider your reporting needs when creating roll-up nodes. For example, imagine that you often run site-to-site comparisons of total energy consumption. Most sites contain multiple assets, so you create a site roll-up node to sum total consumption across all assets. However, there is one site with only one asset. Rather than directly access the lone asset's "Energy consumption" attribute, you should still use the site as a roll-up node to capture total consumption. This will put all your roll-up nodes at the same site level and thereby make site-to-site reporting easier.
View our video on the Learning YouTube channel to learn how to configure a roll-up analysis.

4. Be ready for tomorrow, today, with an integrated view of predictive data

Native support for future data, available with PI Data Archive 2015 and PI Asset Framework 2015

What if you could see failures before they happened? Or knew today whether you were on track to meet tomorrow's demand?

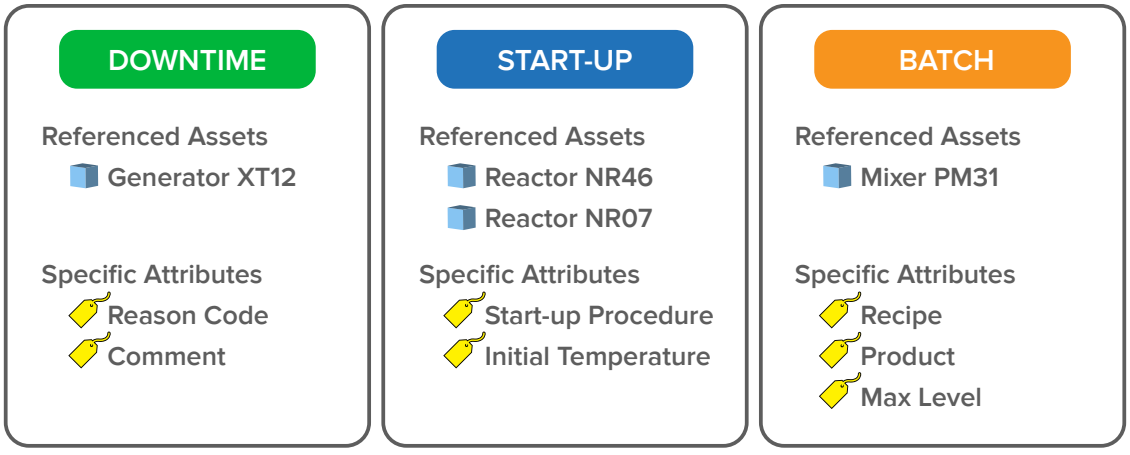
Many businesses rely on predictions and forecasts to support their operations. With the latest release of PI Server 2015 and the native support for future data, you can capture, analyze, and share predictions and forecasts easily and seamlessly throughout the organization. Users can blend historical, real-time, and predictive data to forecast load, improve production planning, or track progress toward target or regulatory limit. The ability to work with future data within the PI System's integrated environment expands your ability to anticipate risks and actively improve your operations.

Learn more about how you can leverage future data from our Learning video, "What is future data?"

5. No more needle in the haystack: Auto-capture events and summary statistics

Event frame generation with Asset Analytics, available with PI Asset Framework 2014

Every industry, process, and business has events that are important to them. While there are systems available that can capture the start and end time for a specific type of event, few systems can capture many different types of events and combine the event information with the process data needed to make them analysis ready.

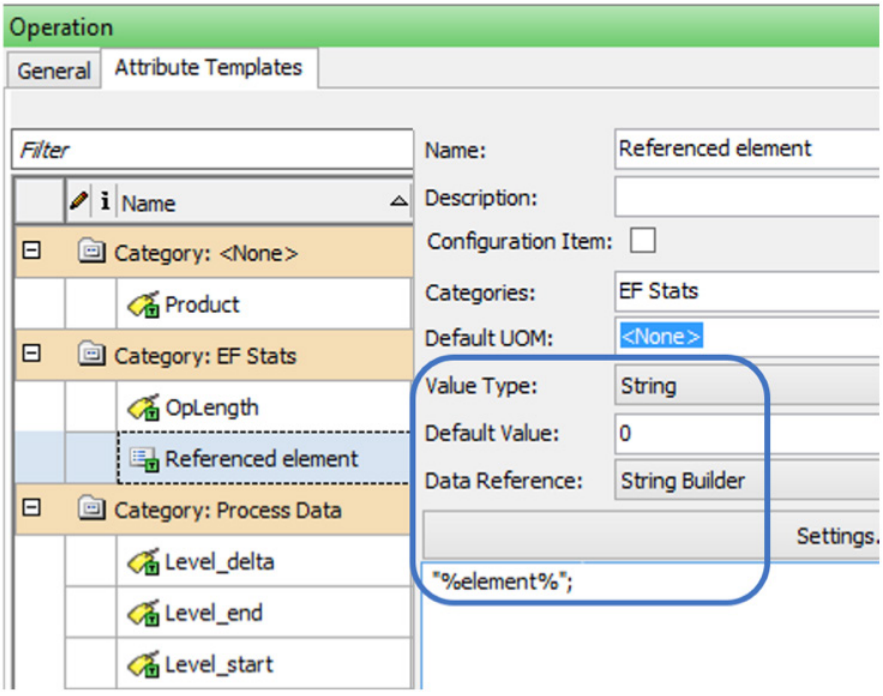


Starting with PI Asset Framework 2014, you can configure Asset Analytics to generate event frames that capture and summarize events and the related data. Instead of indexing by time, event frames allow you to demarcate data according to key events such as start-ups, downtimes, batches, or excursions. You can configure the event summary to return any variety of related process data and summary statistics so that you have all the information needed to conduct downtime analyses, compare different batches, or evaluate excursions. With event frames and the fully configurable event-frame templates, you can devote time to analyzing events, not querying and manipulating raw data. Watch the OSIsoft Learning YouTube channel to learn about event frame templates and event frame generation analysis.

PRO TIP:

All event frames will have a start time, end time, and referenced element. In addition to any summary statistics that you need, another handy trick is to include the referenced element within the event summary so that it can be easily exposed in a dynamic report. To pull the referenced element name into the event frame template, configure the attribute as follows:

- **Value type: String**
- **Data Reference: String Builder**
- **Settings: "%element%"**

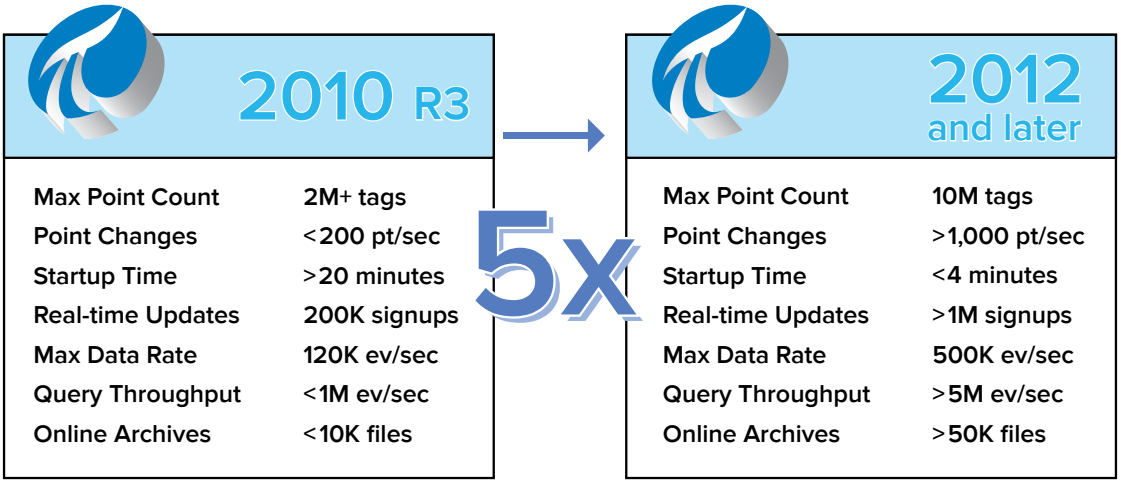


6. Efficiency to do more, even on your existing hardware

PI Data Archive 2012

Your growing business needs can sometimes outpace your hardware upgrade schedule, leaving you with a slow system that may limit the scope or speed of your project. Luckily, PI Data Archive 2012 introduced significant gains in efficiency in core subsystems to enable you to do more, faster, even on your existing hardware. 5X or more increase in scalability in all core metrics, as well as support for thousands of concurrent connections and access to petabytes of data, means that you are positioned for superior performance with room to grow in the future.

Additionally, for PI System Administrators, a 30X improvement in archive reprocessing time means that an operation that would have taken a full 24 hour day can now be accomplished within the lunch hour.



7. Recover from the unexpected

PI Data Archive 2012

Power outage. Accidental shut-down. Hitting "Enter" just a second too soon. Mishaps, large or small, will always occur, and you need a resilient system that gets back up and running quickly, without significant manual intervention. PI Data Archive 2012 delivered several major improvements that decrease both the impact of unexpected events and the time to recover.

- **Automatic queue-file recovery to mitigate risk of queue corruption due to power failures and ungraceful shutdowns.**
- **Ability to detect and abort run-away archive queries so that users are not stuck for a mis-click.**
- **Faster, more efficient PI Data Archive back-up protocols to ensure that large systems can be backed up regularly to preserve critical data.**

See KB00938 to learn more about improvements in event queue recovery, backfilling data, and archive reprocessing.

8. Backfill or migrate data more easily than ever

PI Data Archive 2012

What if we told you that a major, time-consuming, manual task was no longer necessary?

Starting with PI Data Archive 2012, backfilling data no longer requires old archives to be manually reprocessed. The tasks associated with incorporating data from other systems or calculations is drastically simpler because now, any data can be backfilled to the start of the oldest archive without manual intervention. This means that migrating data to create a central source of data is easier and faster than ever before.

PRO TIP:

Unlike Performance Equations (PEs) that required you to perform multiple steps in order to backfill, calculations with Asset Analytics can be backfilled simply by picking a backfill time range within a UI. You can even generate a preview to catch any errors before you begin. For backfill operations, it is recommended to start with a shorter period of time, perhaps one day or one week, to test the backfill completion time before backfilling a longer period.

Read KB01056 to learn more about backfilling with Asset Analytics.

9. Leverage time-series data from external databases without replication

Table lookup for time-stamped data, available with PI Asset Framework 2012

PI Data Archive is the best place to store your time-series data. That said, sometimes you have time-series data that must reside in an external database, such as adjusted production values, or corrected energy readings. But that doesn't mean that such data have to be inaccessible to you or your team. In addition to referencing static external data, such as *last service date* or *manufacturer information* catalogued in a separate maintenance database, PI AF can also reference time-series data from an external database without replicating the data in the PI Data Archive. The external data can then be exposed in PI Client tools with the same ease and integration that is possible with native PI data.

NOTE

The PI Data Archive is optimized for time-series data, whereas other databases are optimized for other purposes. If you wish to see high volume or high frequency time-series data from an external database and notice poor performance, the data reference may be pushing the external database past its core capabilities. In this case, please consider moving the data out of the external database and into the PI Data Archive.

10. Safeguard your data with the most secure system to date

PI Data Archive 2015

PI Data Archive 2015 is the most secure version released to date and recommended for all customers. A total of 56 security vulnerabilities – 21 of High severity, 27 of Medium severity, and 8 of Low severity – have been addressed in this release. Additionally, PI Data Archive 2015 leverages Microsoft software security defenses that are provided by the compiler and operating system. As with prior versions, PI Data Archive 2015 supports Windows-integrated authentication and Windows Server Core.

For more details about the security of PI Data Archive 2015, please refer to the section titled "Security Information and Guidance" in the 2015 release notes.

No matter what version of the PI Server you have, or how advanced your usage may be, there are many great reasons to plan your upgrade and take advantage of the advancements of the modern PI Server.

See the comparison charts below to find out how your PI Server compares to PI Server 2015.

PI Data Archive					
Version	2007	2009	2010 SP1	2012 SP1	2015
Build	3.4.375.99	3.4.380.36	3.4.385.77	3.4.390.28	3.4.395.64
Capabilities					
Supports PI System High Availability.	✓	✓	✓	✓	✓
Facilities security best-practices with Windows integrated security.	x	✓	✓	✓	✓
Centralizes metadata with MDB to AF synchronization.	x	x	✓	✓	✓
Automatic queue file recovery provides higher resiliance to unexpected shutdowns.	x	x	x	✓	✓
Easy data migration and back-filling. No archive reprocessing required.	x	x	x	✓	✓
Major gains in performance and efficiency to enable more with existing hardware.	x	x	x	✓	✓
Natively supports future data, such as predictions, forecasts, and projections.	x	x	x	x	✓
Enables batch to event frame migration.	x	x	x	x	✓

PI Asset Framework				
Version	2010 R3	2012	2014 R2	2015
Build	2.4.x	2.5.x	2.6.x	2.7.x
Capabilities				
Supports PI System High Availability.	✓	✓	✓	✓
Reads and shares time-series data stored in external databases.	x	✓	✓	✓
Simplifies calculations with pre-built functions and auto-complete. No coding required.	x	x	✓	✓
Provides out-of-the-box option to store calculation results in PI Points.	x	x	✓	✓
Easily aggregate data for roll-up KPIs such as site totals or fleet averages.	x	x	✓	✓
Tracks AF hierarchy changes for auditing.	x	x	✓	✓
Streamlines permissions management with PI AF mappings.	x	x	x	✓
Allows calculation results to be stored into the future for forecasts or setting targets.	x	x	x	✓

For additional information about the PI System, visit www.osisoft.com/corporate/Modern-PI-System or email Sales@OSIsoft.com.