# Contextualize: Rolling Out Asset Framework

Ales Soudek

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# Agenda

- Organizational Structure
- Governance Framework
- Template Management
- Building Out AF Hierarchy
- AF Best Practices
- Synchronize Sites with Corporate
- Conclusion


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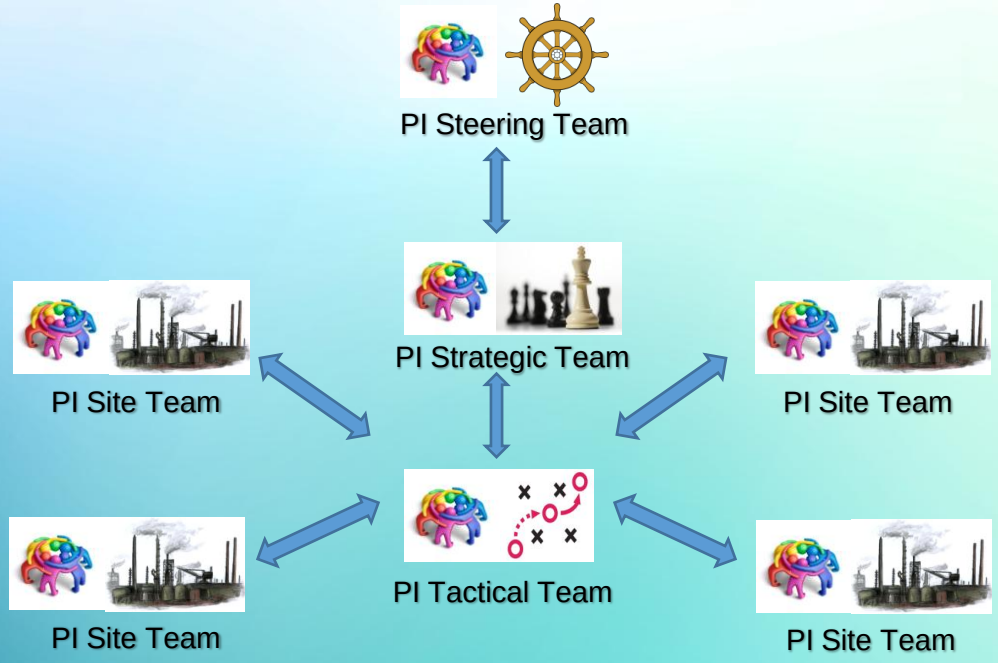
# Organizational Structure




- PI Steering Team
  - Vision Setters
- PI Strategic Team
  - Vision into Action
- PI Tactical Team
  - Project Execution
- PI Site Team
  - Supports Project Execution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# Steering Team – Vision Setters

- Strategic Vision
- Executive Sponsorship
- Manages Commercial / Executive relationship with OSIsoft
- Communicates Value across the Organization


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# Strategy Team – Vision Execution

- Translates Vision into Strategic Initiatives
- Program Manager
- Identifies Value Opportunities
- Run Pilots (PoV) and Rolls Out to Entire Organization
- Implements PI System Governance
- Documents and Communicates Value
- Drives PI System Adoption / Defines PI Training Plans
- Leads a PI User Community
- Communication Channels with Business Users


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# Tactical Team – Technical Execution

- Leads PI System Roll Out
- Enforces PI System Governance
- Master AF Structure
- Executes PI Initiatives in Collaboration with the PI Site Team and Business Owners
- Access Rules and Security
- Ensures Standard PI System Implementation
- Technical Support to Sites


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# Site Team – Site Execution & Support

- PI System Infrastructure Administration at Site Level
- Contact for Sites' Super Users and SME's
- Communicates to PI Tactical Team Sites' Business Needs
- Identifies Value Opportunities
- Supports PI Projects / PI Tactical / PI Strategic teams
- Executes PI Projects with a Site Scope


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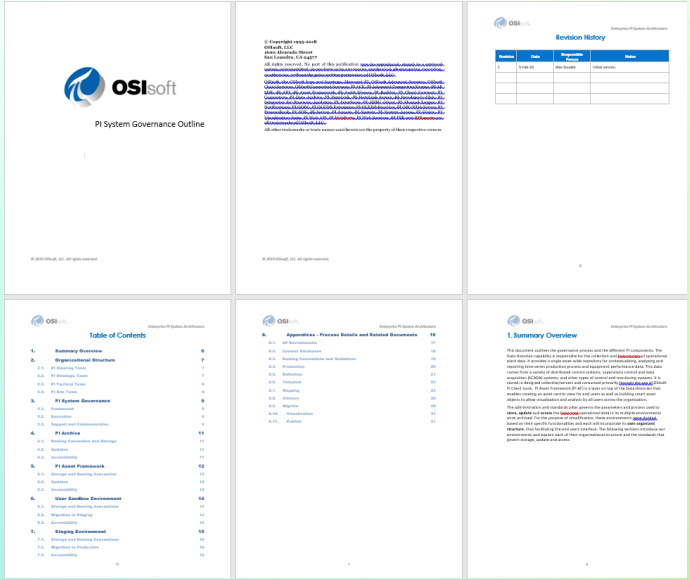
# PI System Governance Framework

- Governance Outline Doc
- Define Teams
- Define Rollout Process from Central PI System to Sites
- Standards for Integration to External Systems
- Change Management Process





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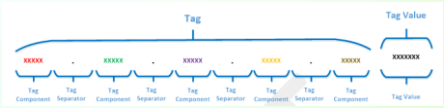
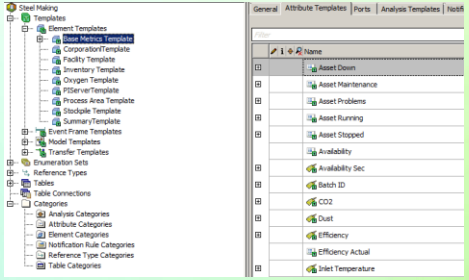
# Governance Framework cont.

- Define Standards and Best Practices
  - Naming Conventions (PI Tags, AF Objects)
- Define Security and Access
- Standardize PI System Architecture
- Approval Process (Change Management)





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# Governance Framework cont.

- Guidelines and Recommendations for Solution Development
- Define Documentation Requirements for Projects
  - Scope, AF Model for Project, Deliverables
- Define Roles and Responsibilities for Project Execution
- Define Process - Baseline, Measure and Document Value


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# Support Considerations

- Resource Pool
  - Learning Resources
  - Testing Environments
  - Sample AF Structures
- Define Roles and Responsibilities at Each Site
- Define Process
  - Disseminate Value Opportunities
  - Define Process - Use Cases / Enhancement Requests
  - Incorporate Site Specific Requirements to Standard PI AF Structure


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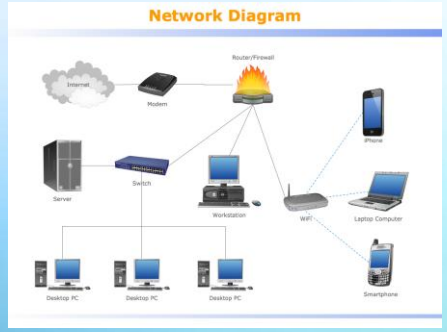
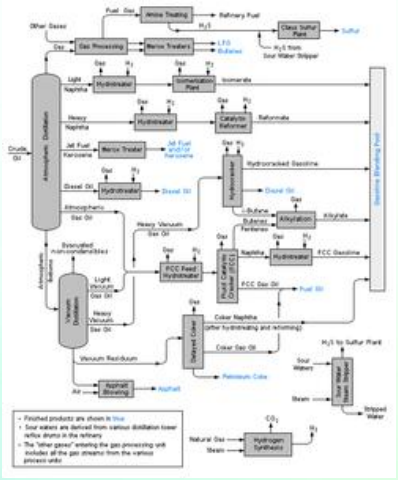
# IT and OT Roles




IT

- Standards
- Security
- Governance
- Roll Out



OT

- Hierarchies
- Templates
- Smart Elements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# Why Templates?

## Used to define particular class of objects

- Definitions are used throughout the PI System
- Element, attribute, event frame, analysis, notification, etc.

## Can be used to auto-create PI Points

- Ensure PI Point naming consistency

## Template inheritance

- Further define relationships between assets
- Start small and grow as needed

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# Template Management

- Assign Subject Matter Experts (SMEs)
- Centralized Storage – Disseminate to Sites
- Follow Company Defined Standards
  - Naming Conventions
  - Derived Templates
  - Analytics


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# Building Out AF Hierarchy

- Follow a standard (S95, …)
- Not SAP hierarchy
- Use Views


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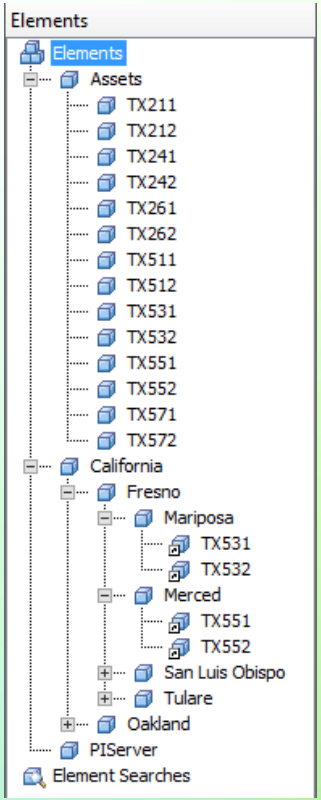
# AF Hierarchies Considerations

- Keep to the Defined Standard
- Group by Geography or Business Units
- Group by Asset Types
- Group by Initiative
  - Production Reporting
  - Operations
- Use References for Different Views





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# Best Practices a.k.a. AF Ten Commandments

1. Thou shalt use **Templates**
2. An **Element Hierarchy** shalt follow standards
3. Different **Views** make life easier
4. **Categories** shalt be used everywhere
5. Get to know **PI Builder** – it is your friend
6. **Defaults** are not your friend
7. **String Builder** and **Event Frames** are more friends
8. Thou shalt use **Units of Measure**
9. Do not only consider **Bottom-Up** approach
10. Thou shalt build **Smart Elements**


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# Smart Elements

**Analyses**
- Efficiency analysis
- Key Performance Indicators (KPI)

**Time-series**
- In-Flow
- Pressure
- Vibration data

**Events**
- Downtime
- Startup
- Failure

**Asset details**
- Name
- Model
- Manufacturer

**Notifications**
- High speed
- Rotor failure
- Low pressure

**External data**
- Performance curves
- Last maintenance date
- Design documents
- Best operating procedures


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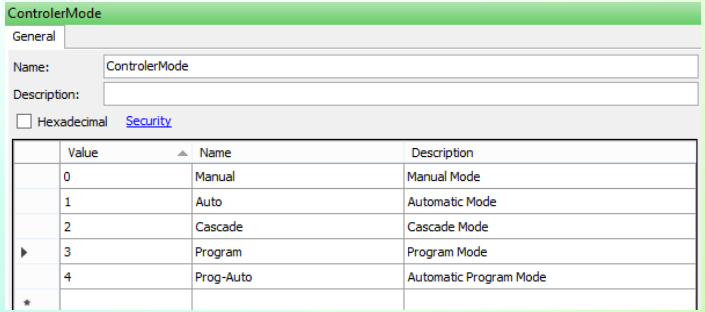
# Some Additional Best Practices

- Use Enumerations
  - Minimize mistakes
- Use Distinct Element Names
  - Less Confusing
- Keep Relational Data in Relational Database
  - Use AF Tables





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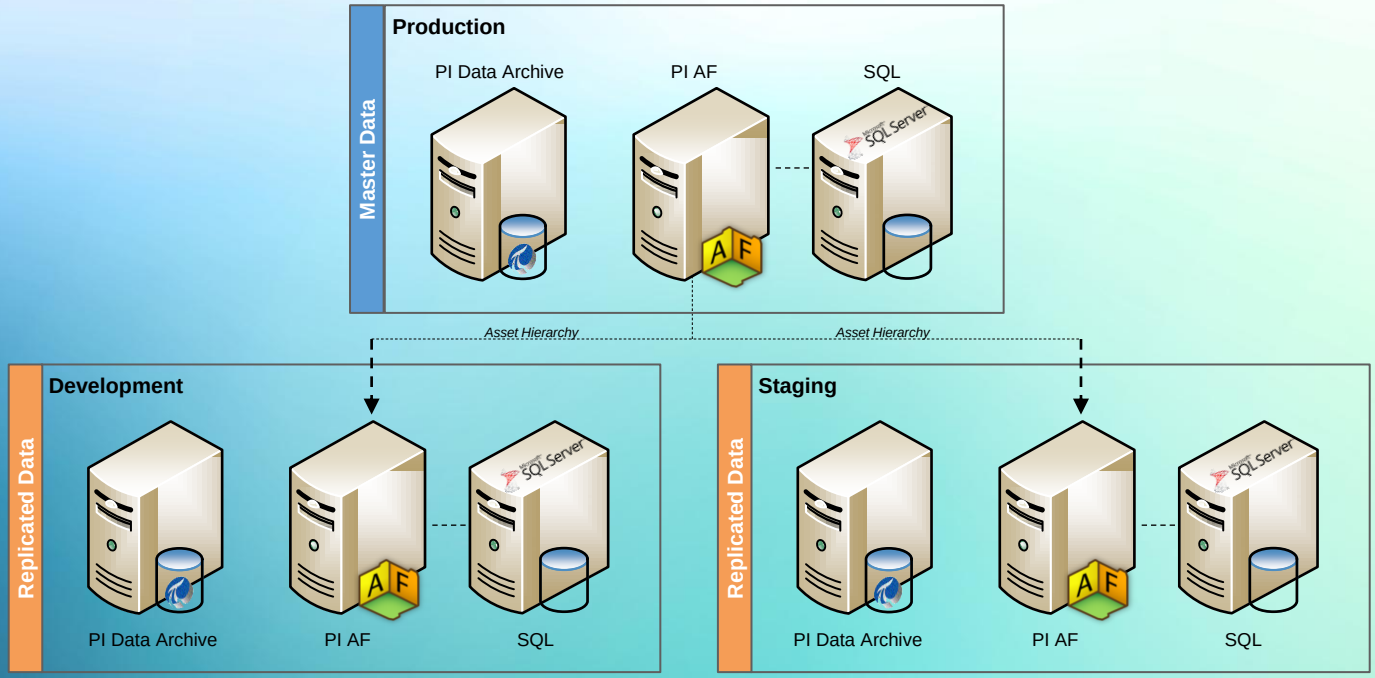
# Synchronize Sites with Corporate




**PI Data Archive**: Stores time series data, which can be accessed by client tools. This server does not access PI AF Server directly.

**PI AF:** PI Server component that enables organization of time-series data into logical and/or physical models.

**PI AF Database:** PI AF database (PIFD) is AF backend stored in SQL Server.

**PI System Explorer:** PI AF client tool used for AF administration.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# Management Between Corporate and Sites

- Master Templates.
  - Deployed to Sites
  - Inherited Templates at Sites
- Define Process for Alerting Changes
- Subject Matter Experts


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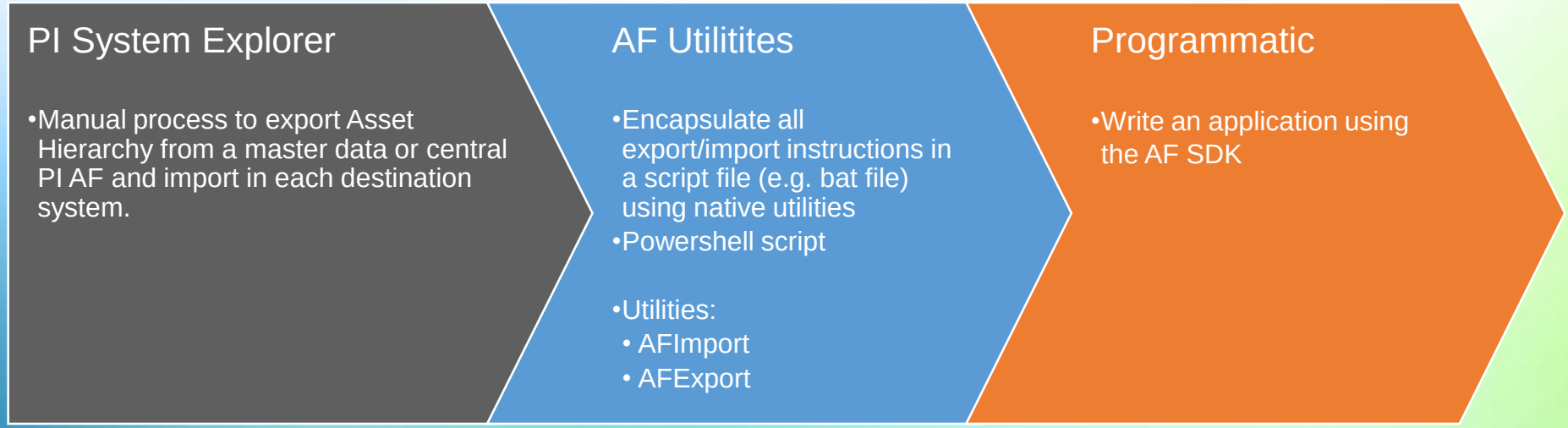
# Promoting Configuration




- **Limitations of PI System Explorer or Scripting:**
  - When AF Objects are deleted on Master AF Server(origin), this deletion does not propagate to destination database when the structure is imported. The import process will add new objects or modify existing ones, but does not remove deleted ones.
  - In order to get the hierarchy on destination database to be the same as master database, it is required to delete everything and recreate it.
  - Once imported, it is necessary to update all data references.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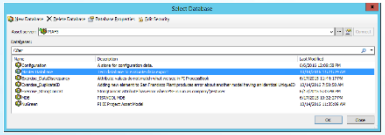
# PI System Explorer

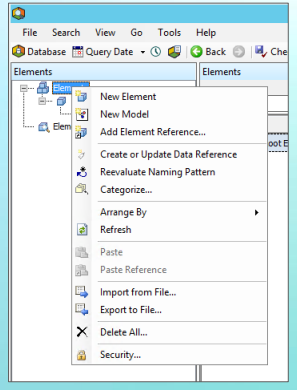
**Exporting:**

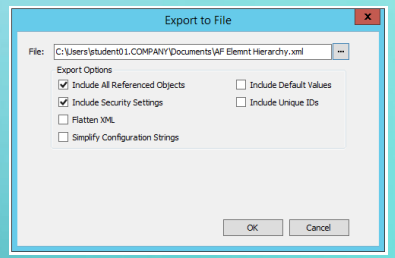
1. In **PSE**, open the database (origin)

2. Right click in the first element (root) in the hierarchy and select ***Export to File...***

3. Inform the ***path file*** and mark the options ***Include All Referenced Objects*** and ***Include Security Settings***





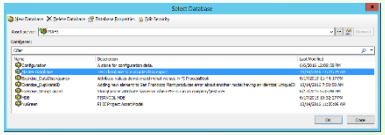



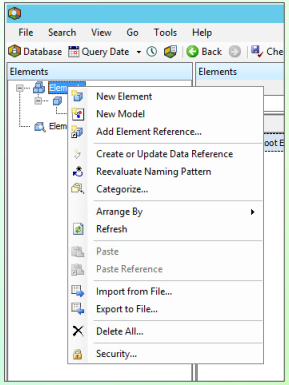

**Importing:**

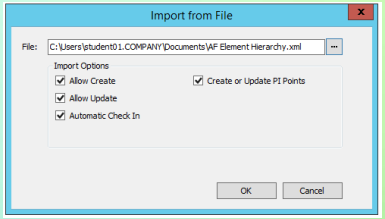
1. In **PSE**, create a database (destination)

2. Right click in the first element (root) in the hierarchy and select ***Import from File...***

3. Inform the ***XML file*** and mark ***All Options***







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# AF Utilities

There are two utilities* that may be used to help automatize the process to synchronize PI AF databases exporting/importing it as XML file.

- The AFImport utility is a command line application that you can use to restore PI AF objects into a database.
- The AFExport utility is a command line application that can be used to archive PI AF databases into an XML format that can be restored later.

Examples:

- AFExport <**AF_Server_Origin**>\<**Database**> /AllReferences /Security /File:**C:\Temp\AFDatabase.xml**
- AFImport <**AF_Server_Destination**> /AllReferences /File:**C:\Temp\AFDatabase.xml**

*These utilities are located in the \PIPC\AF folder in the client machine.


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# Programmatic

- Another approach is develop custom code in AF SDK and .NET to synchronize the database using advanced features that overcomes the limitation of out-of-the-box utilities.
  - For Example, Handling Deletions in Master Template


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# Conclusions

- Organizational Structure and Governance
- Define and Follow Standards
- SMEs Responsibility for Template Content
- Define and Create Rollout Process
- Follow Best Practices


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# The Take Away

Don’t Wing It


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# This is Me

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- Principal Technical Advisor
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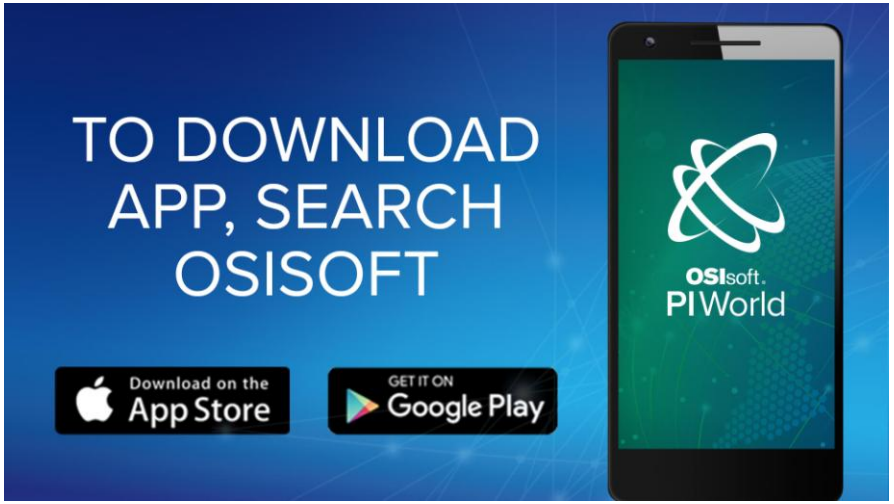
# Questions?

Please wait for the **microphone**

State your **name & company**

# Please remember





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