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Choosing the Right IoT Provider Using Proof of Concept Processes
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IoT is one of the hottest and most highly rated technologies for manufacturers today. Picking the right partner and solutions provider is paramount to success.

Executive Overview

As a manufacturer, there's no doubt you have seen the high levels of information, stories and hype surrounding the Industrial Internet of Things market and the large number of providers that make claims to their expertise in the market. Recent numbers such as from IDC and their December 2017 forecast of $772 billion for IoT spending and Gartner's March 2016 claims of 43% of companies using IoT would indeed indicate a market that is growing rapidly. Indeed, if you were to perform a simple Internet search on IoT or more specifically Industrial IoT which is what industrial manufacturers should be looking at, you will fund hundreds of companies making claim that they can provide systems and expertise. So how can you be sure that these suppliers have the right skill set, experience, and best delivery track record and will provide your company with a solid investment. Make the right choice of IoT Suppliers and avoid going over 40 miles of bad road to a place you don't want to go.

By doing some simple investigation into the supplier's background, you can validate their approach to understanding your business objectives, manufacturing methods and even your company culture. You can sort out the best suppliers from those that will provide sub-optimal solutions. In this document we will provide some guidance of what to look for and what to ask for of an Industrial IoT provider.

Your Industrial IoT provider must bring in-depth knowledge and experience in the manufacturing / ERP industry. This is critical to configuring IoT in the most effective manner to capture and analyze "the right operational data" along with precise ERP integration. Providers without this expertise will likely fall short of delivering a complete, process oriented solution.

Expertise in Manufacturing

Industrial IoT is an extension of manufacturing processes that are already in place in your organization. It is a way to automate the acquisition of machine / production equipment data. Capture that data with the intelligence of in-context relationships of product requirements and machine capabilities. Then present that information in ways that can benefit manufacturing. To accomplish this relationship of the voluminous amounts of machine generated data in the context of manufacturing processes, the IoT provider must have expertise in manufacturing. By knowing what data is important to capture and how to align it with the requirement for KPIs and process improvement metrics; capturing the right data versus data that has no bearing on making process improvements. An example may be the measurement of a dimension of a punched hole in a part. With a punch and die, the circular dimensions do not change unless the punch and die breaks. Collecting this data in real time for analysis may not be as useful as collecting the temperature of the punch and die which would indicate a dulling of the tool before catastrophic failure. A strong IoT supplier also can assist in setting up the proper sensors or even assist with providing PLC and automation hardware so to offer the best and optimal data acquisition of information. To accomplish this, an IoT supplier must be able to bring together Operations Technology (OT) with more traditional Information Technology

(IT) into a single and unified group, to reach levels based on synergies and expertise of both. The value of amalgamation of IT and OT should not be underestimated. According to Aberdeen in their October 2017 publication, best in class manufacturers will create unified IT and OT leadership and guidance with 43% establishing a formal organization.

Expertise in manufacturing also should bring with it the expertise in ERP. IoT will rely on ERP integration for obtaining process targets, run rates, operation details and the financial metrics to provide the in-context display and analysis of the machine data. A supplier should know how to access critical ERP data easily and reliably without having to be overly dependent on the client's IT staff as they are typically fully consumed with daily operations. The supplier also should be competent to work with the ERP to place data generated from the IoT system back into the ERP with security and accuracy and provide the client's IT staff with recommended best practices for IoT to ERP integration.

IoT providers that have years of experience in core manufacturing and updated technology skills (that grew from those past years of SCADA and MES), are the most qualified to provide true Industrial IoT with the in-context manufacturing concepts.

Work with an IoT provider who follows a logical and collaborative approach. They should invest in a comprehensive onsite discovery session and apply their expertise in Industrial Automation, Business and Process Analysis and Manufacturing acumen. This will result in well-defined requirements, a solid delivery approach, and plan to insure on time and on budget success.

Completeness in Solution Discovery and Specification

To properly understand the requirements and provide the best IoT solution, effective discovery and investigations of the production system are required. This typically requires an on-site meeting with shop floor walkthroughs to capture information as to the types of equipment, PLC manufacturers and versions, sensor types, and network infrastructure that is in place. The IoT supplier must have deep expertise in industrial automation and SCADA. Knowing which PLC protocols are in place and are easily accessible versus adding new custom hardware can save a client significant investment. Typically, it's better to directly connect to the machine's PLC to read actual tags and data points. This is assuming it can be done securely and reliably without harmful effects to the PLC. To accomplish this, deep knowledge of industrial automation systems is required. Typically, manufacturing equipment have long lifespans. Therefore, the IoT supplier needs to be able to work with older hardware that may predate current networking. Understanding such connectivity technologies such as RS485, Modbus RTU and how to convert these to more current ethernet protocols is a requirement.

The ideal IoT solutions supplier will also understand manufacturing processes. They will be able to determine if add on hardware will be needed and what the performance characteristics of this hardware should be.

For example, if a high speed punch press needs to have a sensor to count strokes which could run at 800 strokes per minute, a sensor that has an acquisition rating of 50ms should be used in order not to miss strokes of 13 per second (76 ms per stroke). Along with a high-speed sensor, a PLC should be used for local counting to avoid network propagation issues. The IoT software will interrogate the PLC at a lesser rate, say 1 poll per second and capture the aggregated counts.

IoT providers that have perfected formal discovery techniques can effectively gather critical data such as tags from your PLC devices. They will work with your OT professionals to capture this information into standardized templates that can be used then in the subsequent proof of concept demonstrations.

You as the client should expect the IoT provider to produce a detailed discovery which includes an inventory of the devices plus suggested sensors and measurements techniques based on the machine types and technology. This detailed discovery document will be the basis for which a qualified IoT provider will create a proof of concept style demonstration. As a result, the recommended solution and implementation scope will be properly aligned with your business objectives.

To ensure your confidence in Prophecy capability and fit to your requirements, the right IIot Partner will do a proof of concept (POC). The POC collects, analysis and presents your live machine data which is relevant to your process and business operation.

Demonstration via a Proof of Concept

With the plethora of IoT providers hawking their wares, the need to have a solid understanding of what the solution provider can truly bring to the table is critical. PowerPoints and demoware in a market that is rapidly growing is not a way to insure the vendor has a solution that is viable. The best suppliers will offer to perform a proof of concept (POC) of their system running in your plant, collecting live data from your machines and presenting you with analysis, charts and reports that are drawn from this live data. The client should not hesitate to challenge the IoT suppliers to perform such a POC and see the actual results.

As an expert in the IoT arena, Prophecy IOT will always ask our clients to engage with us to perform a POC. This will flesh out the details of the client's manufacturing processes and define the requirements better than a simple PowerPoint and demo.

The Prophecy IoT team has both the manufacturing expertise and SCADA experience. This coupled with their ability to perform the detailed production systems discovery and inventory, they will be able to set up a POC in day one, capturing relevant data on day two and on day three present meaningful results to management team. The details of our approach are as follows:

Day 1 – Physical Setup and Connection

- We will provide an industrial PC server loaded with the full Prophecy IOT software and ready to run. This system can be checked (for Malware or compliance) by your IT teams before it is placed on your industrial automation network in which the PLC devices to be monitored are visible. The system is a Windows server 2016 system with SQL express installed.

- We will then work with your OT team to gather IP addresses and PLC tags of relevant data points from the machines in scope of the PLC.

- We will set up these tags – typically 10-15 using the Prophecy IOT software and begin logging data to the SQL database.

- In the event your security requirements would prevent the Prophecy IOT machine from being placed on your network, we have the option to provide our own PLC which is connected from the production floor via wireless to the Prophecy IOT server. We can temporarily place various sensors on a production machine to capture cycle counts, temperature and other non-invasive measurements. We would typically do the same for machines that are not PLC enabled such as older equipment or machines that have closed / locked PLCs.

Day 2 – Data Logging and Dashboard / Andon Buildout

- Once data is being logged we will begin creating various dashboards to present the logged data in a meaningful formal. This may be in KPI formats if the data logged supports this or more production oriented formats such as Andon type displays. Typically, 10-12 element charts and 2 dashboards / Andon boards are created.

Day 3 – Executive Presentation

- Based on the data collected and the dashboards / Andon boards created, an executive presentation will be made to present the Prophecy IoT solution. In this manner, using data that is logged directly from your machines, the ability to better understand the usefulness of IoT can be quickly seen and measured.

Ready to make the move to business improvement – contact the Prophecy team to find out the details. Through our onsite Discovery / POC approach and years of manufacturing experience, we're confident we can provide a complete, cost-effective solution.

PLC Status   All ⌄

Status	Metric	Value
🟡	Servo Temp	220 °F
🟡	Air Pressure	285 PSI
🟡	Hydolyser	11%
🟢	Pressure Pump	2915 PSI
🟢	Fan Speed	1300 RPM
🟢	Compressor	4450 PSI

⌄

th and Performance

Unit Efficiency   Temperature   Humidity
%   °F   %
49   195   25

Temperature (°F)

°F
200
160
120
80
40
0
    10   20   30   40   50   60
Last Minute (seconds)

Your Machines Hold the Answers

As you and your organization realize the benefits of a sound Industrial IoT solution, keep in mind that picking the right partner and solution provider is the first step in the journey. This decision can make or break the success of the project. As you know, manufacturing is not simple and easy., So picking a partner that understands and has the history and experience in the manufacturing environment is critical to success. Second, working with a partner that takes the time to understand your process and technology requirements in depth - both Operations and Information

Technologies is required. Third, a provider that can demonstrate their solution live, in your environment and showing real information live from your equipment will be the difference between a trusted provider that will deliver a solution and one that you may regret.

To find out more, please contact the Prophecy IoT team at Godlan Inc.

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