Ingersoll Rand

Industrial Internet of Things for the Compressed Air Industry



INTRODUCTION

The world of technology is advancing rapidly. Emergent technologies appear quickly and complete commercial testing to launch within months. Start-up businesses are disrupting the world. At the heart of 90% of these new businesses is data; and aggressive investors know this.

Uber and AirBnB are examples of businesses that use data without owning the net assets. But why exactly is data transforming and disrupting industries?

The International Data Corporation (IDC) now predicts that by 2025, the Internet of Things (IoT) network will consist of more than 41 billion connected devices.

Experts are estimating that the data from these devices will yield insights that drive economic value of more than $11 trillion by 2025.









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THE FOURTH INDUSTRIAL REVOLUTION

Data has been a 'known' resource, with businesses using it in internal and external analysis tools for many years. However, the advent of the Fourth Industrial Revolution and the Industrial Internet of Things (IIoT) has completely turned these traditional tools on their heads. Organizations are now rallying around this accelerated 'connected' phenomenon.

Many organizations still struggle to develop the 'insights' required to gain critical commercial advantages over the competition. This paper will examine why and challenge the accelerated pace of technology, discussing the reasons for developing a connected IIoT strategy that works.

Ingersoll Rand sits squarely within the IIoT lifecycle. It manufactures compressors and associated components that deliver high quality compressed air services. The compressed air market has been around for many decades. Ingersoll Rand continues to be a leading provider of air compression and vacuum products for over 145 years, making us one of the oldest manufacturers of compressors, blowers and vacuum pumps in the world. From humble beginnings in the United States, Ingersoll Rand has grown to be a global figure in the industry with a diverse portfolio and operations in over 30 countries.

Air compressor machines and technologies have made demonstrable efficiency advancements. Take Ingersoll Rand's revolutionary new E-Series compressors for example— these machines offer unrivaled air purity via oil-free compression with breakthrough energy efficiency. Despite these strides forward, the core science of compressing air has changed very little.

Equally the challenges of compressed air delivery to an end user have not advanced. External factors affecting compressed air systems continue to impact the industry. Aspects such as energy, carbon impact and downtime risks all play a key part in the client experience. Similarly, external forces are indirectly impacting the industry. One of these key areas is the IIoT.

As our end-users are changing the way they go to market, i.e. moving from product Capex sales to 'as a service' sales, this has a direct cash flow impact in many compressed air engagements. 'As a service model' businesses are becoming the steady state commercial model in many IIoT enabled engagements.

The "factory of the future" model takes the IIoT concept and applies it to manufacturing. The convergence of high-tech machinery and information technology is creating a paradigm shift within the industry. Just as Lime revolutionized electric scooter rental by connecting available scooters directly to your mobile device, the factory of the future is revolutionizing the industrial process.

Let's not forget, the previous industrial revolutions were not overnight successes. They were dramatic industry-changing steps, but they took many years. They evolved. People reacted, assets were burned, set alight. Reaction was strong. If you're not careful in your own IIot strategy, you're likely to also encounter negative reactions. A little planning goes a long way. Consider the organizational impact of moving your business from a product to an 'as a service model'. People, process and technology assessments are the trifecta that continue to be the force behind continuous improvements.



THE COMPRESSED AIR MARKETPLACE

So what does this mean for the compressed air marketplace? How will IIoT affect the end customer experience in compressed air? We see multiple models across the industrial sector and as for Ingersoll Rand, we strive to maintain a competitive edge across all the markets we serve. A large sector of this marketplace consists of Small to Medium Enterprises. They can be extremely small businesses or up to several hundred employees. IT systems within this group are diverse and range from non-existent in some cases to fairly advanced. Likewise, IT dashboards may be old school or more sophisticated; we are in the mobile app economy. Similarly most Small to Medium Enterprises will be entrepreneurial led, which means brand allegiance will be diverse.

The compressed air IIoT strategy has to be flexible enough to meet their needs, while remaining considerate of the Fourth Industrial Revolution that we are currently experiencing.

Ingersoll Rand has a committed IIoT strategy. By enabling our products with IIoT features we can develop deep insights into behaviors and performance in the field. However, we recognize that the compressed air marketplace needs more than just insights. It needs openness and simplicity to data. End-users have more requirements than just a compressor, they have a requirement for a total air experience that leads to a lower Total Cost of Ownership.

That's why Ingersoll Rand developed Helix™ Connected Platform to support the customer's total air experience needs regardless of the products used to serve the air. The total air experience also has to carry commercial value. Most organizations look to sell IIoT data, however most initial insights yield operational improvements for businesses. This is where most companies' IIoT fails to realize value. Ask yourself, what data do we require to drive the highest operational improvements? As you develop, further insights will be apparent but could have intangible value.


Secure Helix Data Management
Ingersoll Rand
RSe45
RSe22


Air quality as a service
Increased uptime
Reduced risks
Increased productivity
HELIX
Increased efficiency
Integrated analytics
Investment Protection
Extended product life-cycle

IIOT AND THE COMPRESSED AIR LINK

Let's also remember that large industries are pushing many steps to automate IIoT data. These strategic steps usually include one or two of the following, depending on where the most value can be derived.

BASIC DATA ANALYTICS

Basic data analytics enables understanding of product performance in the field. This is the easiest step to take, however it's needed to help you understand your initial business plan.

- Maintenance routines can be planned based on real time data.
- Engineers and technicians can be optimized according to the machine schedules.
- Downtime can still occur, but you begin transitioning from reactive to preventative.
- Data has high value and can change the whole client experience.



PREDICTIVE MAINTENANCE

With predictive maintenance, you accelerate your understanding of machine usage and sensor data. You may not have enough data, or good quality sensors.

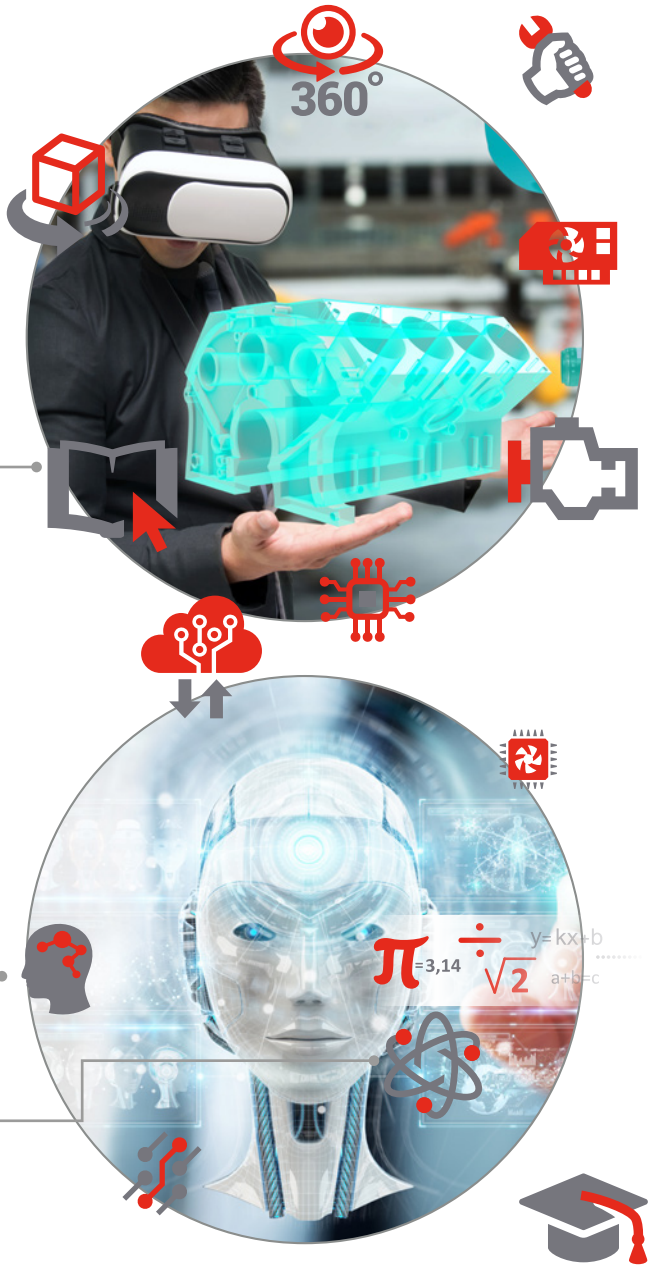
- Adequate data is one of the key drivers and sensors have become more intelligent and cheaper.
- It brings your engineering schedules more forward-based on probability of failure.
- It accelerates your design envelope and helps the business learn.



AUGMENTED REALITY

This is where the connected services and products are overlaid with virtual services.

- Typical use cases involve products being disassembled virtually for the service engineer.
- Augmented reality allows technicians to break down a compressor without referencing paper based systems.



COGNITIVE

Predictive fixed algorithms transform into algorithms capable of learning. However, before learning, they have to be taught.

- Only large companies with AI-enabled tools are pushing this envelope, but they are bringing it to the masses.
- Algorithms are automated and in some proven examples, gives recommendations not answers, before the human has analyzed or absorbed the data.

The compressed air marketplace needs to evolve for IIoT to be successful. Many companies within the sector have developed a connected product strategy, but in most cases it has remained proprietary. This typically means the way the product works and connects has proprietary protocols and

data transfer mechanisms. If you buy a brand, you must always buy their communication and connectivity kit to make it work. Think of the car diagnostic challenges of the 1980s, where prior to the introduction of standardized on-board diagnostics, each car company had a monopoly on their own tools causing major issues for owners and mechanics alike.

Industry and industrial customers need open and secure IIoT analytic support. For Ingersoll Rand, our Small and Medium Enterprises need a platform that works with multiple air installations. This open and secure analytical approach is a defining characteristic of Helix Connected Platform.

The Helix Connected Platform focuses on OPEN, secure IIoT standards, not proprietary ones. It's a game changer for the compressed air market, and Ingersoll Rand aims to keep it simple. Simple helps our Small and Medium Enterprises learn and develop the operational efficiency steps needed in the market to approach this brave new world.

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Ingersoll Rand Inc. (NYSE:IR), driven by an entrepreneurial spirit and ownership mindset, is dedicated to helping make life better for our employees, customers and communities. Customers lean on us for our technology-driven excellence in mission-critical flow creation and industrial solutions across 40+ respected brands where our products and services excel in the most complex and harsh conditions. Our employees develop customers for life through their daily commitment to expertise, productivity and efficiency. For more information, visit www.IRCO.com.

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