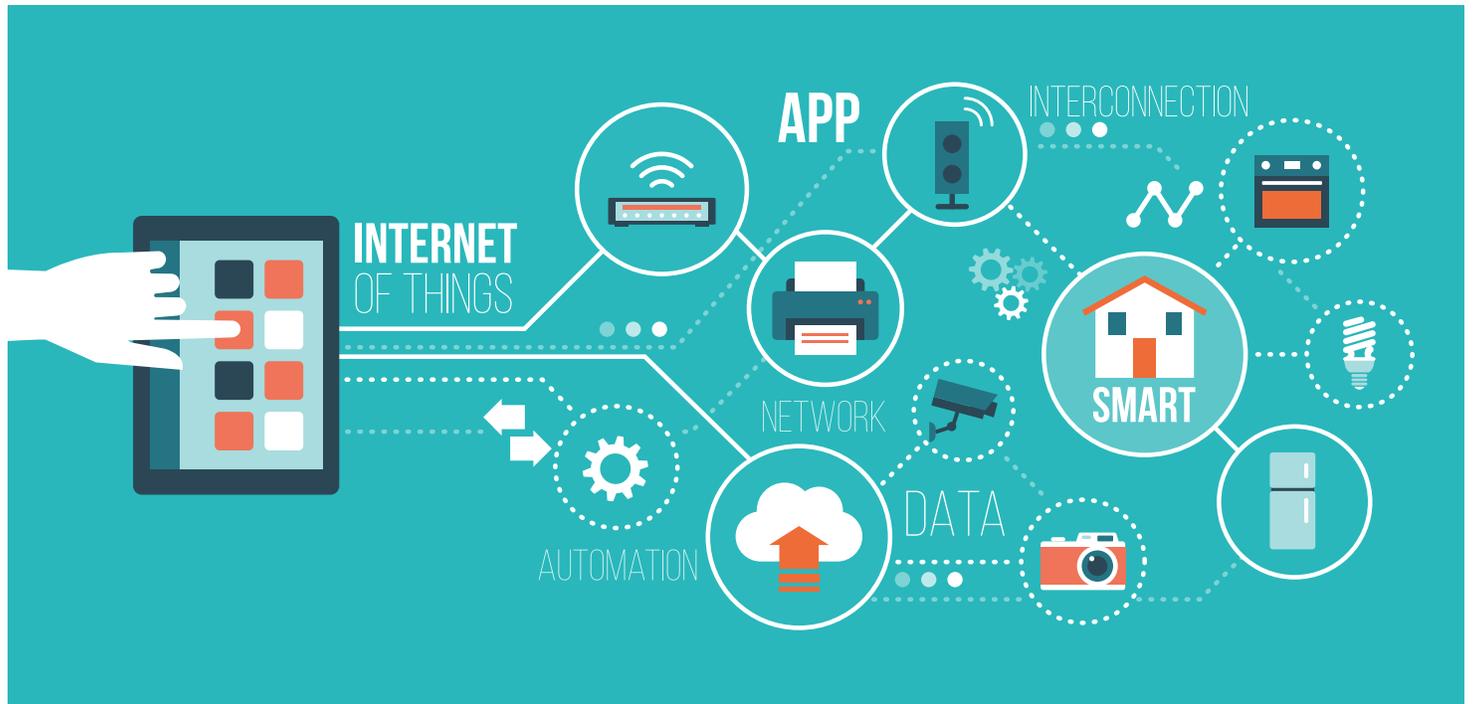


The Next Industrial Revolution

How the Internet of Things Will Improve Your Operations with Smart Technology



As the second decade of the 2000s draws to a close, human beings are living in a truly remarkable era of technology. In fact, it's so remarkable that amazing technological advances have become commonplace. Computers are so small and affordable these days that companies are using them to turn everyday objects into "smart" tools. Lightbulbs and thermostats that can be programmed from your smartphone, fitness trackers you wear on your wrist to monitor your physical activity throughout the day - these are just a few examples of devices that not too long ago seemed possible only in science fiction movies.

Now, fiction has become fact to the point where this type of technology has a name: the Internet of Things. IoT refers to millions of tiny devices collecting and sending data automatically across the Internet. In the consumer realm, IoT is most evident in innovative "smart" products like the ones mentioned earlier - readily available devices that track our activity, monitor our homes, allow us to operate our appliances from remote locations and more. The goal is to make our lives easier by giving us insight into - and control over - the things that affect us on a daily basis.

For many industrial professionals, however, it seems like this level of convenience and insight ends when they arrive at work. After checking their phones one last time to make sure they closed their garage door - and using the phone to close it remotely if they didn't - they spend the next eight hours personally monitoring systems and processes



to avoid maintenance issues and catastrophic failures that can bring their entire operation to a halt.

Industrial IoT, or IIoT, is a modern way to boost productivity and improve the efficiency of equipment and operations. Forward-thinking companies will soon be using small computers, sensors and wireless networks to proactively collect and analyze data across their entire facilities.

IloT – A Brain Center for Your Operations

The human nervous system remains one of the most sophisticated computers ever created. The ability to collect and analyze live data from your machinery is like having a similar nervous system for your entire operation. Today's electronic and wireless technology makes it possible – not to mention practical and affordable – to collect performance data as it happens in real time.

Companies that don't use IloT will be operating with a compromised nervous system that's not firing on all cylinders (or synapses, if you will). Imagine if your foot had to write a report every time you stubbed your toe. Or worse, you couldn't feel it when it happened. Not that it's a pleasant feeling, but a properly functioning nervous system allows you to address a potential problem immediately. Without such a system, all you can do is look at your bruised or broken toe later and wonder "what happened?" after the problem has become significantly worse. In essence, this is how manufacturers have been managing industrial operations for decades.

Of course, the human nervous system isn't merely reactive, it's proactive – and so is IloT. Your hand can feel heat before you burn yourself on a hot stove. Your eyes see objects before they hit you. A well-implemented IloT strategy means you'll be able to detect issues before they cause problems in your process, damage to your equipment and disruptions to your operations. It will be a whole new way to manage manufacturing in heavy industries.

Welcome to Industry 4.0

Industrial revolutions are nothing new; there have been several throughout history. Each one was marked by the adoption of a new way of doing things, followed by a boost in productivity. The first industrial revolution involved the advent of heavy machinery and steam power. Another was born from the assembly line. The most recent, the digital revolution, has centered around computers and automation.

For consumers, each of these revolutions influenced almost every aspect of daily life in some significant way. For manufacturers, each increased productivity. The digital revolution in particular boosted productivity by about 4% a year for almost a decade. However, since 2008, productivity growth in the United States has been a little over 1%. Many experts believe IloT is going to usher in the next industrial revolution. That is why many are calling it "Industry 4.0."

The Industry 4.0 productivity boost comes from:

- **Connected and transparent operations**
- **Eliminated unplanned downtime**
- **Dramatically improved operational efficiency**
- **Heightened safety and environmental awareness**

After the initial investment required to get on board with an industrial revolution, long-term cost reductions

usually occur in tandem with increased productivity. The same is predicted to be true of Industry 4.0. Here are the cost savings that experts expect IloT to bring to various industries by 2020.

10x avg. ROI on Industry 4.0 Investments (IBM)



75% of Manufacturers Plan to Implement IloT in the Next 5 Years (IBM)

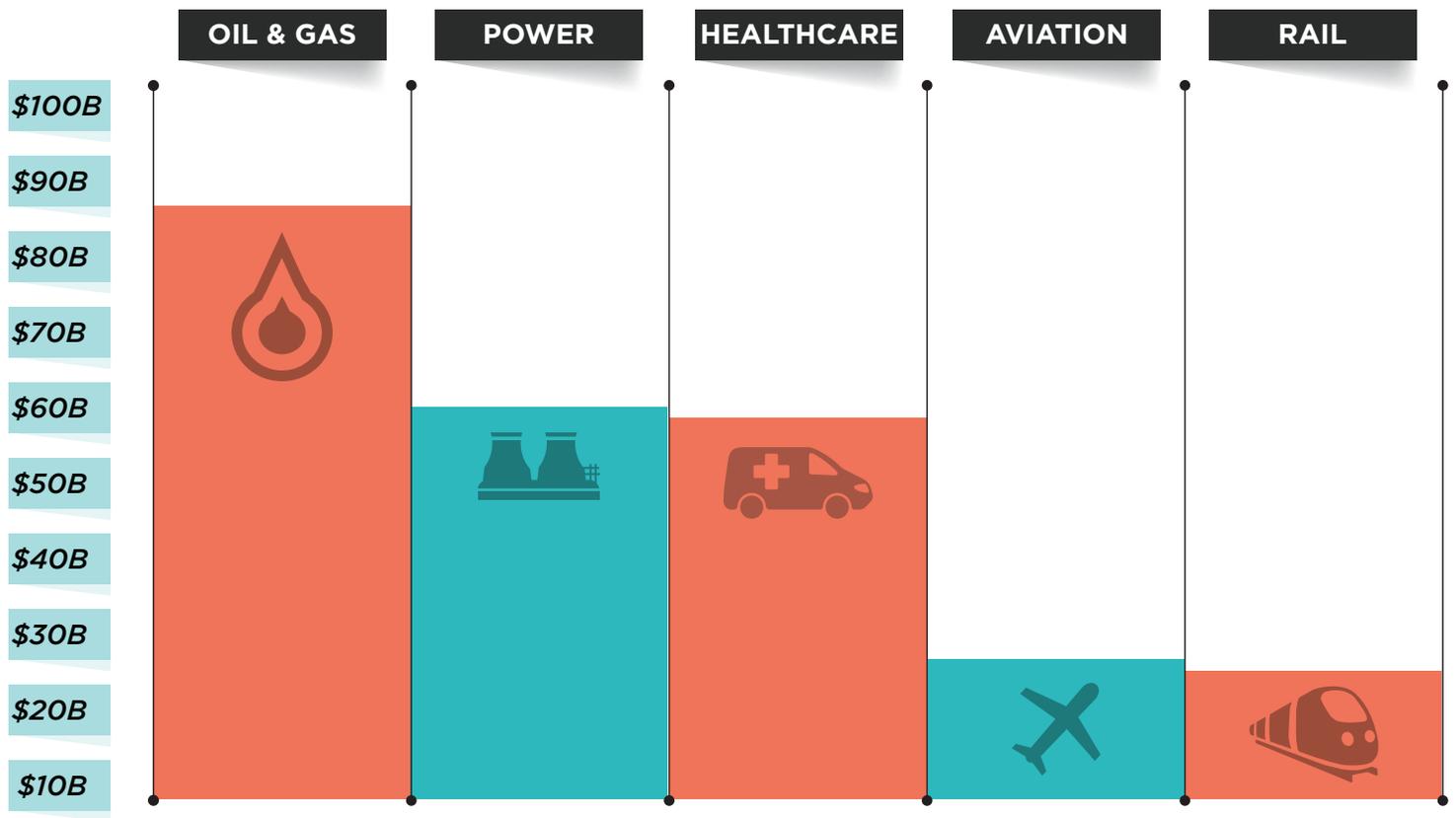
A Revolution for Material Handling

There are many facets to an industrial process, and IloT stands to positively impact each one. Material handling systems can be especially challenging due to their complexity, multiple applications depending on facility and purpose, and the crucial role they play in an operation's overall success. The combination of these factors makes it difficult to:

- **Diagnose efficiency issues**
- **Find bottlenecks**
- **Identify the optimum operational methods for each specific application**
- **Endure unplanned downtime**

Fortunately, each of these difficulties will become a thing of the past – much like monitoring processes without technology. HAPMAN, a global leader in the design and manufacture of industrial material handling equipment, is working to bring technological intelligence to material handling and put our customers ahead of the curve.

Here's a hypothetical example of what our IloT initiative will deliver. With IloT technology installed on a HAPMAN conveyor in a food production facility, pressure and motor current sensors constantly collect data from the equipment. A pattern emerges from the sensors detecting reduced material volume and spikes in power consumption. Just like that, the HAPMAN system has identified a decrease in capacity long before anyone on the floor would notice. The system sends an alert to the supervisor and maintenance team via email, text and push notifications, ensuring that everyone sees the alert immediately, wherever they are.



The chart above shows the cost savings IIoT is projected to bring to various industries by 2020.

The team is now aware of a problem with the motor and can address it during planned downtime, thus preventing any slowdown in production and creating an estimated:

30%
increase in
productivity

48%
reduction in
unplanned downtime

Another example involves our tubular drag conveyors, which are very robust and exceedingly reliable. As such, these conveyors are routinely found in demanding industrial environments and situations where unscheduled downtime is most problematic. However, despite their reputation for performance, they are still subject to wear and require periodic adjustment like all mechanical equipment.

Tubular drag conveyor users have long been aware of the signs that coincide with changes in the equipment's wear and adjustment status, including vibration, amp draws and audible clicks. IIoT technology will make it affordable and convenient to measure, track and interpret these signs in such a way that enables the user to anticipate and schedule corrective action during periods of inactivity. Having the ability to recognize trends and predict when service will be needed has the potential to vault this proven problem-solver to even greater heights.

Smart Solutions to Material Handling Challenges

You need more than just equipment. You need smart systems. We get it, and our team of experts are dedicated

to delivering a modern solution to your material handling challenge. Everything we design and manufacture is backed with a 100% performance guarantee. You can be confident in the ability of our IIoT-equipped systems to prevent problems before they happen, and our availability to quickly correct the situation on the rare occasion that a repair is required.

As the Industrial Internet of Things continues to evolve in the months and years after its widespread implementation, HAPMAN is determined to remain on the forefront of the industrial intelligence revolution. We will continue to launch several pilot programs to prove the value of using predictive maintenance to prevent unplanned downtime for our customers. We will also provide them with powerful integration capabilities so they can incorporate valuable data from their equipment into their existing platforms.

Because IIoT should do more than make your life easier - it should empower you to optimize your industrial operation like never before.

ABOUT HAPMAN

For 70 years, Hapman has provided manufacturing plants around the world with the most technologically advanced powder and bulk handling equipment and systems, offering custom engineered equipment and systems for chemical, food, pharmaceutical, plastics, building, minerals, and other industries.

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