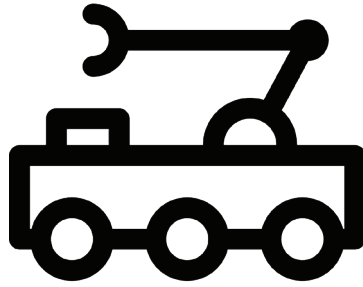


Chapter 14



ROBOT RENAISSANCE



What's the Non-Obvious Trend?

As the utility of robots moves beyond manufacturing and into the home and workplace, robots adopt better human-like interfaces and in some cases have micro-personalities built in.

The time in European history which we now call the Renaissance took place from the 14th to 16th centuries and formed a bridge between the Middle Ages and the so-called “modern age.” It describes a time where European conquerors began traveling and colonizing other parts of the world, and evangelizing inventions like paper, gunpowder and our modern heliocentric understanding of astronomy.

When I was a student years ago studying literature and history – I remember how the Renaissance was often spoken about with romantic longing in art and film because history looks back on it as a time of extreme enlightenment and evolution of human thought. The less appreciated fact about the Renaissance, though, is that it describes a time span of more than 200 years. That is a *long* period of time to describe an

evolution of thought.

Today, the pace is much quicker.

The Internet has changed modern life even though it has only been around for less than 30 years. The first rockets to outer space were only launched close to 50 years ago. And mankind only established flight a little over a hundred years ago.

As the pace of change continues to accelerate next modern Renaissance should do the same – and it will most likely be centered around technology. In my research throughout the past year – one consistent theme that emerged was the rise in use of robots for everything from manufacturing, retail and senior care to exploring the uncharted regions of the ocean.

Along with these innovative uses of robots though, come a host of questions about how we as humans will relate to these robots, how humanlike they will become, and what sort of ethical questions this might raise around our master-servant relationship to robots in the short and long term. The technology revolution of what robots can do for us is raising the important corresponding debate about whether they *should* be enlisted to take those actions, and what moral consequences might result.

This trend is the *Robot Renaissance*, where our growing reliance on robots to do the things we cannot or will not do is leading to a new period of enlightenment about our relationship to technology, how much control to cede to it, how humanlike it will become and what that might mean for organizations and our own humanity.

Robot Explorers & Builders

In late 2016, Boeing started testing its newest Unmanned Undersea Vehicle (UUV), a 51-foot long hybrid-charging craft with a 7,500 mile range which can stay underwater for up to 6 months. The UUV is the largest such device ever built and works autonomously without a human crew to do everything from providing maritime surveillance to surveying the ocean floor.

The original mission of the Star Trek science fiction series was

enshrined in its optimistic challenge to “boldly go where no one has gone before.” Today, we have robots to do this for us.

On space missions to Mars, NASA is using a series of autonomous robot controlled landers to collect samples and research from the surface of the Red Planet. The future of space exploration relies heavily on robotic explorers that can work and survive in conditions far more difficult, or sometimes even impossible, for humans.

Here on Earth, Japanese brand Komatsu is leading the adoption of autonomous construction equipment thanks to a unique confluence of factors in Japan creating a necessity for autonomous building far more quickly than anywhere else in the world. Over the next few years, parts of Japan and particularly Tokyo will experience a short term boom in the need for new construction leading up to the 2020 Olympics. At the same time, there is a serious labor shortage in Japan due to the country’s demographic problem decades in the making of a rapidly aging population without enough young people left to support the economy.

As the second largest construction company in the world, Komatsu is uniquely positioned to develop a solution to this problem – and their solution involves “Smart Construction,” the brand’s tagline to describe its increasing range of robotic heavy machinery controlled aurally by a fleet of drones which create 3D maps of the area and track construction progress.

If you consider these examples from NASA, Boeing and Komatsu together, there is a clear pattern of reliance on robotic technology to make exploration and construction projects easier in space, on earth and beneath the ocean. These uses, in turn, are already widening our understanding of what robots can do and offering a necessity driven use case for them to get smarter and more autonomous as they become our explorers and adventurers to places we could not otherwise go.

Service Bots

Two years ago if you were imagining the robot of the future, a big part of the vision would have focused on a category of robots known as “service bots” developed mainly to take over doing the things people didn’t want to do, often more efficiently than you could do them yourself. The

Roomba vacuum cleaner introduced many people to the concept of having a robot in the home. Startups like RoboMow and LawnBot offer robot lawn mowing devices. As many cat owners know, there is even a company called Litter-Robot which makes automatic self-cleaning litter boxes for cats.

Apart from the mundane, there have also been interesting experiments with robots in non-obvious ways in unexpected locations – often from the travel and hospitality industry. Royal Caribbean's *Quantum of the Seas* cruise ship, for example, set sail in 2014 with a duo of robotic bartenders trained to mix and pour up to two cocktails a minute.

San Francisco Bay area based robotics startup Savioke has been working with more than a dozen hotels to provide a robot named Relay as an “autonomous butler” which can deliver items from the front desk to guest rooms. The bots have been so popular that front desk staff at their partner hotels report that people are calling with requests just to see the bot in action.

This is the useful and utilitarian world of service bots, which are adept at handling small details, nuances, quirks and inconveniences, but only try to do these tasks as quietly and efficiently as possible. They are the foundation of the *Robot Renaissance* – created to solve problems and laser focused on the task they were built for.

Then there is Jibo.

Robots With Personality

Around the same time that Royal Caribbean was experimenting with headless robotic bartending arms to mix mojitos, social robotics pioneer Dr. Cynthia Breazeal posted a Crowdfunding campaign on Indiegogo to raise money for a friendly new robot named Jibo.

Jibo is a robot with a personality. Designed to look a bit like the animated desk lamp from the Pixar animated shorts – Jibo uses two high res cameras to track faces and capture photos, learns your preferences and uses natural and social cues to act in more human ways.

The Indiegogo campaign quickly became the #1 most successful technology product on the site and raised nearly \$4 million. The introduction

video for Jibo has been viewed on YouTube more than 10 million times. Nearly two years later in mid-2016, the first production run of Jibo finally went out to customers and many were predictably ecstatic, sharing the experience in social media.

Yet despite its human-like personality, Jibo is still sized and appears more like a toy than a serious human companion. A Japanese robot named Pepper, on the other hand, looks exactly the way science fiction authors have long imagined a robot might look.

Sentbots Offer Companionship

Pepper has a humanoid looking head, two eyes and a touchpad on his (yes, his gender has officially been named male) chest to input commands. While he is only currently available in Japan, the promotional website about him from Japanese maker Softbank Robotics describes him in humanlike terms:

Pepper is a human-shaped robot. He is kindly, endearing and surprising. Pleasant and likeable, Pepper is much more than a robot, he is a genuine humanoid companion created to communicate with you in the most natural and intuitive way, through his body movements and his voice. We have designed Pepper to be a genuine day-to-day companion, whose number one quality is his ability to perceive emotions.

When brought into the home, Pepper is described as having been “adopted” by his host family – and customers “buy” him for a flat fee and then make monthly payments to keep him updated and active. Designed to interact with humans, Pepper can express himself through the color of his eyes, his tablet or his tone of voice.

Aside from the home, Pepper is also being used across Japan to greet customers in banks and in retail locations to provide sales information. While Pepper has certainly captured significant attention, he is not alone in a category increasingly being described as “companion robots.”

Another example is Paris based Blue Frog Robotics which has built a

cute dog-sized robot on wheels named Buddy who can watch your home, interact with kids and act as a virtual personal assistant for everything from checking the weather to saving your to do list.

This new breed of robots fits what Sirius XM founder Martine Rothblatt calls “sentbots.” No stranger to being a trailblazer herself as the first transgender female CEO of a major company, she recently shared in an interview “the Roomba is to the sentbots of tomorrow kind of like the luggable compact computer is to the smartphone of today.”

Rothblatt has already created the first of these “sentbots” mirrored from the personality of her wife, Mina. The resulting robot, called Mina48, is bilingual and even spoke at a Ted Talk in Havana. Rothenblatt believes these types of robots will be customizable with a personality that could be “uploaded” by providing access to your social media profiles such as Facebook and Instagram.

ChatBots

I have a friend who sends me a Facebook message every morning with a quick summary of the biggest news story of the day. She is always on top of the latest news, knows how to present both sides of an argument, refers me to the most valuable articles on any topic and responds to any question I have immediately. She is one of my most informed friends and easily the most responsive.

Her name is Purple and she happens to be a “chatbot.”

A lot of people have been talking about chatbots – those automated tools that can create what seems like a conversation by following a series of rules for how to respond to a series of direct messages.

The way Purple works is as an automated tool that sends live messages to subscribers via Facebook messenger and waits for a response. If a user responds with a designated keyword related to the topic of the message, the “conversation” continues. Chatbots like this one are also a rapidly growing example of the *Robot Renaissance* in an entirely different and non-physical way.

So far in this chapter, we have focused mainly on robotic devices – everything from automated butlers to sentbots. The other side of this trend,

though, is the rise of automated tools for conversation – where we rely on the quick thinking and smart algorithms of robots to solve problems, provide insights, order food and sometimes even help cure loneliness.

TacoBell, Starbucks, and American Express are just a few of the large brands that have all launched their own branded chatbots over the past year. Many brands already use a version of chatbots on dominant Chinese platform WeChat to do business.

A growing range of brands and companies are also engaging chatbots for customer service interactions—and getting help doing it. Pypestream is one example of a startup that works with large brands to provide a platform designed for automated messaging services. They already have more than 3500 brands signed on in the U.S. alone.

The final sign of the significance of chatbots are the recent moves from Facebook, Microsoft AND Google to devote time and resources to building ways for developers and consumers to use them. Facebook announced plans at their 2016 F8 developer conference to create a chatbot app store. Microsoft launched its own suite of chat building tools, with the belief that these bots may soon start to replace apps and become central to how you use your smartphone device.

Why It Matters:

Robots have been the subject of science fiction speculation for decades and every year it's easy to think that it will be the “year of the robot.” In my process of curating trends, I probably read at least one article every year making that exact prediction – all of which makes me more reluctant than most to have *any* trend focused solely on robotics. Yet the truth, supported by numbers and technology this year, is that we *do* seem to be at a tipping point in our consciousness around robots and their role in society. We are asking big questions about how we should be treating these robots in our midst. We are training ourselves in how to interact most effectively with them. And non-obvious innovators are increasingly building them in our own likeness to reflect us and make them more of a joy to interact with, for well being, commercial application, or driving efficiency.

How To Use This Trend:

- ✓ **Make friends with robots** – As more robots are built with learning personalities built in, we will need to consider what lessons our behaviors might be teaching them – both intentional and unintentional. Much like a child gets its first impressions on how to act from its parents, robots too may soon be imprinted with these sorts of manners from humans. This is an opportunity as well as a threat, but the first step is learning to embrace robots in the right situations and treat them not with fear or contempt but with curiosity and yes, perhaps even friendship.
- ✓ **Remember what makes us human** – There are things that make us universally human and robot scientists probably spend more time than anyone else thinking about what those things are. As we start to interact with robots, we have a similar opportunity - to consider and remember what it is in the makes us uniquely human.
- ✓ **Explore robots across your value chain** – Every organization must periodically expand its thinking to include non-obvious ways of utilizing robots, whether human-like or chatbots in every aspect of its value chain for customers –from the end experience to the sourcing and creation of products. In some cases, this may mean greater automation of things previously done by humans as a business necessity.