Future:Now

Forces Shaping Four Key Industries: Financial Services, Healthcare, Transportation and Manufacturing

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Introduction

Even the most casual observer knows that our world is changing at breakneck speed. All one has to do is wake up in the morning to hear the drumbeat: cashless economies, robot workforces or driverless vehicles. It seems like just yesterday that these were abstract, even fantastical, concepts. Today each stands on the precipice of adoption. But what are the opportunities key business leaders see for their industries by 2030?

In the following report, we'll highlight opportunities that lay ahead – with a view towards 2030 – in four sectors: Finance, Healthcare, Transportation and Manufacturing. Each opportunity has been identified by way of advanced secondary research coupled with interviews with C-Suite executives across each industry, as well as leading academics and futurists.

Here's what we found out…

The in-depth research effort was conducted by Interfuse Analytics and Atlantic Re:think and Interfuse Analytics.

Qualitative Interviews: Atlantic Re:think conducted one-hour interviews with C-Suite executives in the U.S. across each of the four industries. These twelve executives were from companies with at least 500-1,000 employees. Thoughts were also elicited from a panel of six academics and futurists, each of whom specialize in strategic forecasting across the four industries.

Secondary Research: Interfuse tapped into its extensive library of secondary research/trends data-bases, including Mintel, YouGov, Canvas8, eMarketer, Quid, etc. to harvest and analyze existing data/ research on trends in each of the four industries.

*Please note: names have been anonymized to protect interviewees' privacy.

Financial Services

Today's rapidly evolving financial landscape promises consumers better, more secure experiences. Three key trends (outlined below), which are still in their early stages, underscore the potential of this era, from transforming the banking industry (fewer brick & mortar banks, more AI interfaces, new currencies) to fundamentally changing the way everyday people across the world access and spend money.

The Rise of Cryptocurrency and Blockchain

Bitcoin, the talk of Wall Street for most of 2018, has experienced a dramatic rise and, most recently, a precipitous fall – as have most other digital cash alternatives. But what is its long-term future? The jury is somewhat divided.

Bitcoin "is the most secure software that's ever been developed in the world. Every day that it continues and every new currency and new person that's brought into the network increases the likelihood that it will be a true global store of value standard."

Jonathan T., a New York-based futurist

However, all of the C-Suite executives inter-viewed would be surprised if cryptocurrencies make up more than 5 to 10% of the market by 2030. "I think it needs to mature," says Robert M., a former Managing Director of a financial services company, "and you need to get some truly reputable companies working with it to make it more broadly acceptable. But I don't see that happening in 10 or 20 years." Likewise, Sarah P., a Washington D.C.-based strategic forecaster, says she is "unimpressed with the concept of cryptocurrencies," and adds that "a

quite dystopian view of government would have to arise for people to look to primarily private money instead of government-issued currency."

So why are we even discussing cryptocurren-cies? Because of the underlying technology that powers them – blockchain – and its potential to virtually eliminate fraud. Marketline predicted last year that blockchain could "become the new underpinnings of the global banking trans-action industry." Indeed, Nasdaq expects the global blockchain market to reach $14 billion by 2022, with a compound annual growth rate of 42.8%.

From a consumer perspective, Robert M. calls blockchain "a game changer" in its ability to speed up consumer transactions: "My company feels there's huge applicability in the credit card and retail worlds, and has been egging on commercial partners to keep investing and investing." The potential and promise of blockchain is perhaps best summed up by Frank B., a global futurist, who says, "The ability to have that level of security and transparency is quite powerful. And in the financial industry, it's one that they're taking very seriously for good reasons, because it allows a level that they've never seen before in terms of redundancy and security. Secondly, there's an element of convenience that rises considerably

as you start getting more digital: you're no longer chained to operating hours between nine and five, or the inability to transfer funds. Whether it's Venmo on through, there are all sorts of things that the financial industry is watching right now, trying to figure out how to stop, but all of which tap into a deep-seated understanding and expectation of consumers, which is, this should be easier. This should be something that I can control. And this should be something that is actually beneficial to me as a participant in this transaction, that doesn't require me writing a check, or going to the bank, et cetera. The disintermediation in many ways ends up being a huge element that's attractive and powerful."

Clearly, blockchain is the future basis for financial transactions. It is still, however, underdeveloped with unrealized potential. With no one company having yet cornered the market, it's wide open to would-be innovators.

The Cashless Economy

From Sweden to Kenya, the world has been witnessing a swift rise in electronic payment systems. In the Sweden, Riksbank reports that a mere 1% of payments were made with hard cash in 2016. In Kenya, mobile money platform, M-Pesa, offers a largely unbanked population the ability to access funds and make seamless transactions. The prevailing opinion is that the electronic payment market will only continue to boom in developing nations that lack an existing banking infrastructure.

The general consensus is that 80% of U.S. transactions will be cashless by 2030.

The U.S. of course has a massive infrastructure in support of traditional banking and those interviewed believe that a 100% cashless economy is unlikely in the U.S. "Certainly," says Robert M. "Younger and future generations are going to be widely accepting of a cashless economy, but getting all the pieces to fit together is the challenge: a willing consumer, a willing merchant and an infrastructure—whether it's driven

by the banks or by the non-banks."

One thing is certain: demand will only continue to grow. Thus, the general consensus from those interviewed is that 80% of U.S. transactions will be cashless by 2030. Given the increasing adoption of apps like Venmo and Apple Pay, and mobile card readers like Square and PayPal, consumers are clearly open to operating without cash. However, the opportunity for technology providers would appear to be stronger in developing countries where SMS mobile banking has the potential to reach a vast untapped market.

Robo-Advisors and Artificial Intelligence

According to Juniper Research, robo-advisor platform revenue is projected at $25 billion by 2022, growing from estimates of just $1.7 billion in 2017. As individual investors respond with interest to a technology that promises algorithmic guidance at reduced fees, wealth management firms have been ramping up in an area that could prove lucrative. As futurist, Frank B., sees it, "Artificial Intelligence in financial decision-making has the potential to help people help themselves with less and less involvement. The ability to actually almost set it and forget it in the classic sense ends up being quite appealing, because you do actually get benefit out of it at the end of the day." Meanwhile, Eric S., CEO of a consumer finance company, believes AI will play a significant role because of how widely individuals can be categorized and segmented: "We're not a world of eight billion individuals. Similar types of people will benefit from the same advice and experience."

While there are already many robo-advisors in the market, the AI that powers them is constantly evolving as developers seek new ways to improve the robots' understanding of the market. Additionally, technological opportunities exist on the back end, as financial providers identify more repetitive tasks than can easily be replaced by machines.

What will things look like in 2030? Most think that the great majority of consumer-facing bank roles will be eliminated, but also believe that some human element to financial advice

will and must remain. This is not just because (as one futurist put it) "unwinding existing relationships is never easy," but because as Sarah P. puts it, "people still need people to love and care about them and give them advice from that perspective." Nevertheless, the prevailing opinion is that there is real momentum in the space, and if human advisors are to stay at the forefront, they'll have to offer greater value. "Thousands of people claim to be financial advisors," says Gregg G., a former CIO, "...half don't know what they're doing. They could all be replaced with sophisticated software."

Healthcare

In today's fractured healthcare system, experts see huge opportunities for technology that will improve patient outcomes by harnessing and consolidating data. Data touches every aspect of healthcare: costs, drug trials, patient care, even the amount of visits we take to the doctor's office. But what needs to happen for data to deliver the benefits it's capable of? The following trends reveal a number of answers.

The Effort to Contain Costs

With global healthcare spending projected to increase at an annual rate of 4.1% through 2021 (Deloitte), government, the private sector and healthcare providers are seeking innovative ways to provide more efficient care. Costs simply must be reined in. But among the many barriers remain regulatory uncertainty and a system that is often slow to incorporate methods that can streamline processes. "In U.S. medicine," says James M., CEO of an MD-led group practice, "we're notorious for even when we know what the right thing is to do, it's as long as 10 years before most are delivering care in that fashion."

Nevertheless, providers know that they have to improve in order to meet the demands of an aging population. Technology companies therefore have a big opportunity in the areas such as telehealth and automated records. The former has the potential to provide consumers with access to care while reducing office visits and travel time. Deloitte predicts that wider adoption of this convenient care model can prevent complications and reduce costly ER visits; app-based and online services like Doctor on Demand and Teladoc are already contributing to improvements. As for automated record-keeping, robotic process automation (RPA) and AI can allow providers to spend more

time providing care and less time documenting it. The need here is great. As Drew A., CIO of a California-based health system says, "The back office is like the 1960s. Even if people have electronic health records, they use them like they used to use paper. We still don't use them smartly. That's part of our challenge."

Futurists and academics agree that the challenges won't be easily overcome, but assert that the industry has no choice but to turn to technology more and more to make the administrative and analytical aspects of healthcare more efficient. They also will have to respond to the demands of generations who have grown up with technology. "Between now and 2030," says Jonathan T., "the last part of the baby boom and the millennials are beginning to worry about health. They will accept nothing less than investments and technological improvements in healthcare."

Although most don't expect the U.S.' IT infrastructure to be fully realized by 2030, they generally feel that disruptive digital developments could accelerate things. Michael O., a PhD academic notes: "We may not be all the way to the finish line by 2030, but we should be at the halfway point. The early stages of enabler solutions are there. The basic foundation of digitization of records will open up the other pieces, and some of the things could be much more accelerated by 2030."

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Aiding an Aging Population

By 2025, 1.2 billion people on Earth will be elderly, and by 2020, chronic diseases such as cancer and diabetes will account for almost three quarters of deaths worldwide (World Health Organization). Combined with a predicted mass shortage of healthcare professionals,

with expected deficits of about 155,000 physicians and 500,000 nurses (Today's Geriatric Medicine)[1], this could have serious ramifications on global healthcare systems. The sector will increasingly look to new technology to help them care for a population with increasingly high healthcare usage.

Yet there are not enough companies working to address the problems of our aging population and its outsized impact on healthcare costs. Yes, there are medical tracking devices widely available. But the market awaits a greater level of sophistication – disruptive devices that eliminate unnecessary medical visits and enable effective out-of-home treatment. "The truth is," says James M., "not much happens in the intensive care unit that couldn't be safely delivered in the home." However, it's important to note that providers say they expect to be rewarded for medical treatments that occur in the home rather than the office; a next-generation compensation model needs to be put in place.

As Michael O., puts it: "With big data, we can put the predictability into the actions that are taken. Algorithms will help us to quickly look at similar patients who have had a given condition and how they responded to treatments."

Growing Popularity of Personalized Medicine

Personalized medicine, also referred to as precisions medicine, examines each person's genetic composition to create a customizable treatment plan. Currently, an estimated 90% of the conventional and top-selling blockbuster medicines only work for 30% to 50% of patients (Forbes)[2]. Knowing the genetic makeup of certain illnesses allows physicians to create a targeted therapy that functions more effectively. For example, SkinDNA has developed a genetic test that creates a full profile of a person's skin and allows physicians to create a customized care plan. Similarly, Deep Genomics leverages AI to decode the meaning of a genome in order to predict the potential effects of a particular mutation.

In response, leading pharmaceutical and biopharma companies have nearly doubled their investment in personalized medicines in the

last five years. From a technological standpoint, however, the field is still very much in the developmental stage. While some players have adapted their existing technologies to gain a foothold, others have yet to make the leap into what promises to be an area of exponential growth – one which some believe is close at hand. "I think we're on the cusp of it being much more tangibly applicable for a much larger patient population than it is today," says James M. "What's really unknown is if it will intervene early enough to avoid a condition from actually evolving at all. Right now, we're using it for treatment only. I suspect there are many people who are looking for opportunities to get ahead of the curve – and prevent diseases from becoming clinically symptomatic."

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James M., CEO of an MD-led group practice

Futurists, on the other hand, expect a slower uptake over the next 12 years. They generally believe that the ROI is not yet there for researchers, insofar that treatments are still targeted to a narrow population. In addition, they see a need for better integration of healthcare providers and insurers, as well as greater willingness among physicians to look to purely technological support in choosing medications and dosages.

Connected Care

One of the biggest barriers to a more efficient healthcare system is the current state of medical record keeping. Data remains as siloed as ever – with improvements in integration between providers improving only at the local level. There exists a great need for electronic health records (EHR) and technology that can securely allow patients and providers easy access to their data. James M. sees improvements as being critical to improved care: "How do you most effectively extract patient information so that the physician isn't spending a chunk of time trying to figure out what information is there? That's the most powerful component of EHR. I think we're on an unavoidable path to consolidation and data aggregation because there's a great need to extract information in a usable format in front of the patient."

As we look ahead, academics and futurists see patients becoming more responsible for their own data – showing up at their doctor's office and presenting their information on a thumb drive or wearable. They also foresee more consolidation and integration of data through third parties like Epic Systems, a healthcare-focused software company. Importantly, any advancements in connected care will require safe encryption of data. There thus exists an opportunity for technology providers to integrate blockchain into the healthcare space.

Transportation

In the coming decades, there will be an influx of people to urban areas. Unless changes are made to our cities' existing infrastructure, we're doomed to a future of snarled transportation. But where there are challenges, there are also opportunities: easier and greener commutes, safer driving and more access to travel. Here are four key trends on the horizon.

Intermodal Mobility

The vision of intermodal transport is to enable a seamless integration between the different modes of transportation so that travelers are guided through the optimal mix of modes – from any point A to any point B, any time. This could solve some of the biggest challenges in passenger transport, particularly in urban areas, by shifting a huge portion of personal mobility to public transport and car/ride-sharing – reducing emissions, traffic jams and accidents, as well as improving productivity of the traveling workforce. Similarly, it could significantly improve the efficiency and flexibility of supply chains and enable innovations like shared goods transportation spaces to avoid empty trips of trucks. But there are hurdles, including:

- The cost of technological infrastructure to integrate diverse systems like air and bus travel.
- The challenge of connecting public systems with private firms (e.g., car share).
- Integration of payments and digital integration (i.e., data sharing between companies that currently see each other as competitors – e.g., Uber and Lyft)

The prevailing opinion of C-Suite executives is that intermodal will indeed take off in passenger transportation, but there is still a lot of work to do.

Peter A., former airline CEO, sees both the promise and inherent challenges: "Intermodal mobility could provide an entire journey on a single ticket. But it's unclear if that advantage is dwarfed by the complexity of managing the backend and the data integration."

So where are things really headed? The prevailing opinion of C-Suite executives is that intermodal will indeed take off in passenger transportation, but there is still a lot of work to do. Futurists likewise don't see full integration into the U.S. until 2040 or later. In the short-term, intermodal will continue to take hold in freight transport. "Intermodal freight has a bright future," says Lawrence T., CIO of a U.S. railroad. "There are big capacity problems on the highways, so intermodal is an attractive way to deal with it."

For passenger transport, the adoption of intermodal relies greatly on the success of our next trend...

Vehicle-to-everything (V2X)

V2X is a technology which allows vehicles to communicate with other vehicles, as well the surrounding traffic system: streetlights, buildings and even cyclists or pedestrians. The technology uses a short-range wireless signal to communicate with compatible systems, and this signal is resistant to interference and inclement weather. These vehicle/smart city systems are naturally seen as key to the eventual adoption of fully intermodal transportation systems. Those interviewed believe the implementation of each will necessarily track together over the next decade, and will be more quickly adopted in congested, less sprawling cities like New York and San Francisco.

Automakers are responding with connected vehicle programs and embracing electrification – where they see the future of the industry. But most experts believe that V2X won't be fully operational in all passenger cars for another 20 years, as it depends in great part on cooperation between local governments and private companies. Where they do see imminent adoption of V2X is commercially. Scott H., former Chief of Staff, Cybersecurity at a major U.S. automotive manufacturer, says "V2X will be incorporated into transportation, but not necessarily people movement... (expect) packages moving in a logical way—reducing the number of double-parked UPS trucks."

Car Sharing/Ride-Sharing

As the cost of car ownership rises and the cost of ride-sharing apps remain low, it's expected that people around the world will be giving up their vehicles. In fact, a new study by a Stanford University professor predicts that private car ownership will drop by 80% by 2030. It's no surprise then that Global Market Insights

Inc. forecasts the car sharing market to record year-over-year growth of 35%, with collective revenue of $16.5 billion by 2024.

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"Car sharing is certainly impacting car ownership," says Albert P., a transportation futurist. "In addition, there's a lot of research to suggest that services like Uber and Lyft are even pulling people out of public transportation and that it's replacing it; that people are finding it more convenient to take an Uber or Lyft one-way, and not have to take it as a first and last mile connection. But in some cases, it can augment transit in a way that late night transit services, where transit might be infrequent. There are cases where people are taking it to transit stops, but in general, a lot of emerging research suggests that Uber and Lyft type services are pulling people out of both private vehicles and out of public transportation."

Driverless cars are also a topic of great interest. As more competitors enter the ride-sharing arena, Uber's dominance is waning. To stay competitive, Uber is investing in autonomous vehicles, hoping that in the long run this will cut costs. Other companies may soon enter the arena. Given the market's huge potential for growth, it seems that investment in autonomous cars may prove profitable (although most experts believe this will take at least 15 years). In addition, most ride-share companies use some form of algorithm to calculate costs per ride, availability and quickest routes. Developing this tech so that drivers can make more rides in less time may also prove valuable to ride-share companies.

Innovations in Public Transport

Few subjects in public transport ignite more excitement than high-speed rail and hyperloop, but which one has a brighter future? In Europe and Asia, where the government takes a highly active role in transportation, high-speed rail is witnessing strong growth. Even autonomous trains now exist in places like Copenhagen and Vancouver. In the U.S., it's a bit more complicated.

"At this point," says Lawrence T., "we're struggling with high-speed rail. Because we just haven't invested in it. The country is such a large expanse and we're so spread out. So it's very hard to justify increasing Amtrak speed from 79 miles per hours to something like 150—which is about as fast as you can safely go on a train." Most interviewees agreed: they don't expect to see high-speed rail in the U.S. in the foreseeable future, contending that studies have not been able to justify it as an economic alternative to air travel. On the other hand, some experts maintain that rail is likely to gain in popularity in coming years (especially in urban areas) and that potentially successful high-speed rail projects like California's will only increase consumer demand.

But the C-Suite executives in our study are most optimistic about hyperloop, as it does not have the infrastructure challenges of high-speed rail. In fact, they expect a prototype of Elon Musk's futuristic sonic vision in as soon as five years and potentially wide adoption by 2030. "Hyperloop is a game changer," says Lawrence T. "If you can travel at 500 mph in a tube, you're moving as fast as the airline." Adds Peter A., "If hyperloop does take off, it will beat everything in my view. Conceptually it's very strong and I believe it could be a reality in the next 20 years and change transportation quite substantially from what we are used to today."

Richard Branson's Virgin Hyperloop One completed a successful test of its passenger pod last August and lists 2021 as the year it will have production cities it plans to operate in.

Manufacturing

Manufacturers are transforming to respond to consumers' increasing desire for customization. As manufacturers seek to build "the smart factory of the future," the integration of all systems is key. Here are the key trends in the space…

Mass Customization

Mass customization is the unifying vision behind many of the current manufacturing innovations like Internet of Things (IoT), 3D printing and AI. Ultimately, the concept means being able to deliver perfect parts, even in small batches, with the same degree of automation and efficiency as in mass production. This requires a manufacturing environment and supply chain that can adapt instantly to changes inside and outside the company. It has so far seen its widest adoption in the European automotive industry—as a necessary response to consumer demand. "The expectation of car buyers today," says David K., CEO of a transportation manufacturer, "is that they want to personalize their car. Outside of Mercedes, BMW and Audi, nobody is really moving on it."

Generally, the interviewees agree that in U.S. automotive there is a gap between the more traditional "brute force" customization currently used and the high-tech solutions discussed—especially with smaller firms that have barriers to investment. But they nonetheless believe that as the U.S. responds to consumer demand, mass customization will be a way of life by 2030.

For manufacturing in general, a prerequisite of mass customization is "vertical integration" or a convergence of operational technology (OT) and IT systems and processes. The C-Suite executives interviewed agree that it is one of the most important issues in manufacturing today. As Keith Y., CTO of an electric bus manufacturer stated, "Vertical integration is a mega-challenge in any manufacturing enterprise today. It's critically important. The challenge is to produce the same things, perfect parts, every day no matter the machine or the operator." Given this, they feel that successful vertical integration will be limited to large enterprises in the shorter term, and will take beyond 2030 for smaller firms to implement.

IoT

"IoT is an area that's on fire right now and it will become ubiquitous by 2030," says Keith Y. He's right. By 2021, according to IDC, 20% of the top manufacturers will depend on a secure backbone of embedded intelligence, using IoT, blockchain-and cognitive, to automate large-scale processes and speed execution times by up to 25% (Industry Week). What's more, the IoT market size for manufacturing alone is expected to grow by 114% through 2022 (Thomas).

Given that IoT is well on its way to full integration into the sector, the next phase may be identifying where the technology might benefit from advanced development of analytics.

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Keith Y., CTO of an electric bus manufacturer

Labor Shortage Could Bring Manufacturing Back to U.S.

The numbers are startling: 2.7 million, or 22%, of U.S. skilled manufacturing workers are retiring over the next decade, according to Deloitte. This comes at a time when the manufacturing industry needs to add 700,000 skilled employees. Thus the industry will face a massive shortfall of two million workers. The Bureau of Labor Statistics adds that the U.S. will need three million more workers in the next 10 years to fill low-skilled jobs in order to achieve economic growth. Given these stark realities, U.S. manufacturers will very likely rely heaviest on automation to make up for the shrinking workforce.

The effect of this shift may very well be that manufacturing centers will leave places like China, which still rely on a massive human workforce, for more cost-efficient, U.S. smart factories. However, some futurists believe otherwise. As Sarah P. states, "my vision is that people could be working in digital production anywhere in the world with people connected to the local market doing customization, but lower-cost tech workers doing the broad production work." Still, the majority expect automation to create technological opportunity. And while the market for low-skill robots is saturated, the subset of smart robots is expected to grow. ●

[1] P. Buerhaus , D.O. Staiger, and D.I. Auerbach, The Future of the Nursing Workforce in the United States (Sudbury, Mass.: Jones and Bartlett, 2009)

[2] Schork, Nicholas J. "Personalized medicine: time for one-person trials," *Nature, International weekly journal of science.* April 29, 2015.

June 2018