

The Fourth Industrial Revolution: Digital Disruption in Retail

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The pace of modern mankind has been set by defined industrial revolutions – starting with steam in the mid-1700’s, then electricity, then electronic information and now we are currently in the [Fourth Industrial Revolution](#) (4IR) where digitization of the physical world will affect every facet of our lives. The borders of industrial revolutions are murky, comprised of breakthrough technologies with varying adoption, but it is clear each revolution has taken about half the time to run full cycle as its predecessor; from 120 years for steam, to 40 years for electronic information.

What is common about all past industrial revolutions, is the comprehensive ways each changed the entire society; not just industries. Technology from the space race and computer-fueled process automation of 3IR put a computer in our hands, connected to other computers around the globe, and creating the environment for Amazon and Apple to become the most valuable companies in the world at \$1T each¹.

The tech titans of today all share one main characteristic – they leveraged a group of technologies (largely not invented by them) and placed calculated bets on developing technologies to disrupt whole markets and ecosystems.

By disrupting how books were sold by applying existing and developing technology, Amazon extended its online concept to over 5.5 million products in its catalog - some items being delivered within two hours - all within its short 23 years of existence! Brick and mortar retailers, secure in their “moats” of retail location, “current” technologies and accepted consumer habits, failed to understand and grasp how the pace of consumer adoption of technology would upend the traditional retail model.

This trend to digitized retail is merely at its early adoption point and largely set up from 3IR. Key technology developments within 4IR will further revolutionize retail at a pace

¹ At market close, September 4, 2018

determined not by retailers, but *by the tech-savvy consumers* they serve who are relentless in their search for simpler, frictionless lives; this is a defining difference between today and yesterday. Personalized experiences, faster and simpler transactions, reduction in delivery times, greater value and better selection are all promised by the technologies within 4IR.

The Conexxus Technology Research Committee (TRC) is deeply engaged in analyzing 4IR implications as part of its Roadmap project; to identify key opportunities around culture, systems and business models our industry should consider to be prepared for competing in the future retail landscape².

Some of the key 4IR technologies TRC has identified and will be discussed in future articles:

- Big Data – the exponential growth in enterprise-generated data that holds key insights into consumer, employee and operations. Disruptors tease data from all sources to gain digital analysis of the physical world in order to *personalize* consumer offers and ensure the right item is available at the right time, at the right price.
- [Internet of Things](#) (IoT) – the generic definition of *anything that generates or captures data* to be reported into a big data pool. Classically, scanning POS and inventory systems have been our mainstay IoT devices, but non-traditional data feeds, such as Waze traffic, Google search, weather data/forecasts, store heat maps and sensors, mobile devices, all contribute to a richer pool of big data from which to analyze and respond to the physical world.
- Artificial Intelligence (AI) – the ability to use advanced computing power to make sense of all the big data generated through enterprise and IoT sources in order to optimize operations and consumer offer. Comprised of [Deep Learning](#) (where a machine identifies patterns and draws conclusions similar to humans, working with humans) and [Machine Learning](#) (where a machine deep learns and reacts to results without human intervention). Among many benefits, AI promises to unlock the value of big data and IoT streams by performing analysis at a speed and volume no humans can replicate.
- Robotics – the automation of predictable physical, process and data tasks. Most people envision of machine [robot](#) performing a task (physical), but [Robotic Process Automation](#) (RPA) is a more immediate application. Robotics relies on

² The Roadmap Project is open to all parties interested in defining critical changes to our operations over the next 10 – 15 years. Conexxus invites anyone passionate about strategic planning to engage with this effort that will be annually reported to the industry. Please contact Gray Taylor at gtaylor@conexxus.org to learn more.

the three 4IR foundational technologies – Big Data, IoT and Artificial Intelligence
– to fully reach potential

- **Autonomous Transport** – the use of self-driving vehicles to deliver people and goods without the expense of human supervision. Autonomous transport relies on development in robotics to reach full productivity, and also may impact energy markets.
- **Augmented Reality** – the overlaying of data and physical replications over the physical world. Virtual reality is a sub-topic of this technology, and is a complete rendering of a physical space used for total simulation (e.g. training hazmat responders). Augmented reality, where data or even renderings of things is displayed on personal displays, such as glasses lenses and mobile devices, provide the next generation of man/machine interface. If you played Pokemon Go, you have engaged in augmented reality!

Conexxus will continue to this series, so connect with [Conexxus](#) to continue receiving our [newsletter](#) as we dive into the deeper implications of 4IR on retail and our customers. Be sure to follow us on [LinkedIn](#) and [Twitter](#) to stay on top of key news and views around technology shaping our industry.

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