VIVE LA RÉVOLUTION

An examination of the Fourth Industrial Revolution and its impact on various industries, with a specific focus on the fashion industry.

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Abstract

The Fourth Industrial Revolution is the latest installment in a series of major technological and manufacturing developments; however, it is proving itself vastly different from its predecessors, due to its speed and widespread effect. There are nine key technological trends driving the movement, each building off of the Digital Revolution, which gave rise to computers, the Internet, and smartphones. This revolution stands to impact all industries across the globe, leaving no business or person untouched, and the fashion industry is no exception.

This study, therefore, aims to deepen the understanding of the current and future impacts of the Fourth Industrial Revolution on the fashion industry and explore the plausible solutions to champion fashion's embrace of the Revolution. The researcher employed in-depth literature review as a means of critically examining pertinent trade and academic publications. If the fashion industry is to survive, it is vital that it incorporate technological advancements, including artificial intelligence, robotics, and 3-D printing, with developments in materials science, in order to find new and sustainable ways of satisfying consumer desires. Bringing these advancements into the industry will be especially successful in areas such as reinventing mass customization, identifying consumer behavior, and establishing firm connections between garments and wearer health. These interdisciplinary practices will alter the very core of the industry, giving rise to a future filled with mutually beneficial collaborations between scientists, engineers, designers, manufacturers, and retailers, each concerned with creating more efficient and sustainable means of production and consumption and providing individualized service to consumers.

Literature Review

Defining the Fourth Industrial Revolution

The concept of the Fourth Industrial Revolution is based on that of *Industry 4.0*, which was identified by Henning Kagermann, head of the German National Academy of Science and Engineering, in 2011 (Geissbauer, Vedsø, & Schrauf, 2016). The *Fourth Industrial Revolution* as a separate notion, however, was brought to the public's attention by Klaus Schwab, the founder and Executive Chairman of the World Economic Forum, who wrote a book on the subject and made it the theme of the Forum's Davos conference in January 2016 (Schwab, 2016-a). Both terms are used interchangeably; however, *Industry 4.0* generally refers specifically to production and manufacturing, while *Fourth Industrial Revolution* is used to describe these production and manufacturing processes and their social, psychological, economical, and political impacts.

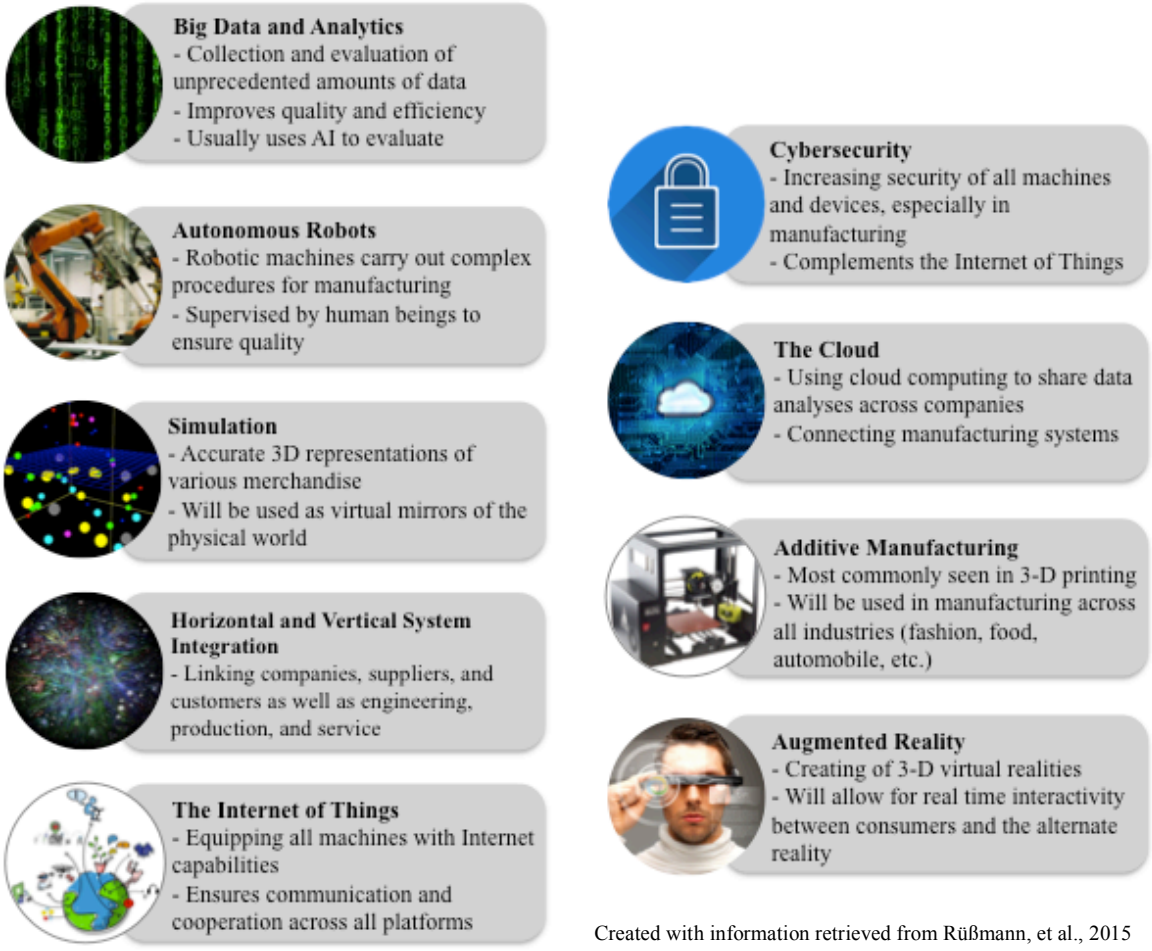
Background To establish what exactly this term means and fully comprehend its societal impact, one must first have a firm grasp on a brief history of the three preceding industrial revolutions. The First Industrial Revolution began in the mid 18th century in a period that has become known as the Enlightenment. The world saw important technological developments including: the production of steam engines, the rediscovery of cement, the invention of an inexpensive cotton gin and the mechanical loom, the improvement of iron making, and the introduction of gas lighting (Tortora & Eubank, 2010, p. 232; "BoF VOICES…," 2016). The Second Industrial Revolution, which took place from the late 19th to early 20th centuries, continued to build off innovation from the First bringing more breakthroughs in technology, manufacturing, and science. Advancements during this period include light bulbs, internal combustion engines, new alloys and synthetics, and mass production (Editors of the Encyclopædia Britannica, 2016).

The Third Industrial Revolution, also known as the Digital Revolution, began around the 1960s. The Digital Revolution has completely reshaped life as we know it. This revolution brought the rise of computers and the dawn of the Internet, which completely altered the ways in which human beings communicate and connect with one another. Digitization also changed the way in which products are marketed, viewed, purchased, and consumed. Though each revolution shaped the world's history and escorted it into the modern era, the Third Revolution in particular, has molded the very fabric of human life by fully integrating technology (Isaacson, 2014; "BoF VOICES…," 2016).

Working Definition The Fourth Industrial Revolution will prove to be an entirely new animal, as it will affect *all* industries across the globe, which will in turn profoundly affect the very core of society. At present, the revolution is characterized by the integration of various technologies with the digital, physical, and biological sectors. It drives an interconnectedness that will obscure the lines that currently separate industries, forcing collaborations among professionals and experts who previously would have not even considered working in tandem (Schwab, 2016-a). Technology from the Digital Revolution may have changed the way goods are marketed, sold, and consumed, but the Fourth Industrial Revolution will change the goods themselves.

Despite having barely entered this revolution, new innovations have already begun to arise. Breakthroughs are taking place in nanotechnology, biotechnology, materials science, energy storage, and quantum computing (Abnett, 2016). There are currently nine technological trends that have become the cornerstones of the revolution. They include: big data and analytics, autonomous robots, simulation, horizontal and vertical system integration, the Internet of Things, cyber security, the cloud, additive manufacturing, and augmented reality (*Refer to Figure 1. for details regarding the basic premise and importance of each aforementioned technology*) (Rüßmann, et al., 2015). The rate at which these breakthroughs and innovations are occurring is historically unprecedented, making the Fourth Industrial Revolution distinctly different from its predecessors.

Figure 1.
Nine Technological Trends of the Fourth Industrial Revolution



Created with information retrieved from Rüßmann, et al., 2015

Gaps in Comprehension As Alan Marcus, head of the information, communication, and technology agenda at the World Economic Forum, discussed at the Business of Fashion's VOICES forum in June of 2016, several gaps in knowledge have appeared as a result of the continuous innovation. These gaps prevent people from fully comprehending the abilities of the technologies they have access to and from using these technologies to exploit opportunities created by the Fourth Industrial Revolution. A gap between the Third and Fourth Industrial

Revolutions exists in the implementation of technologies and one's ability to grasp and understand it. A second gap occurs between the hype that surrounds technology and the fear that it promotes among industries and consumers alike.

A gap also arises between leaders and stakeholders of technology, which means that no one is *really* talking to the public and asking the people what they want. A fourth gap is between technology and values, whereby ethics are an afterthought, though they should be influencing technological designs. Additionally, gaps are present between information and contextual intelligence, as well as digital natives –people who have never lived in a world without technology and readily integrate it in their lives –and digital immigrants –those to whom technology is still relatively new ("BoF VOICES…," 2016). Each of these gaps will make it difficult to bridge the world in its present state to that of its future; however, because the revolution has already been called into the spotlight and remains in its infancy, we are presented with the unique opportunity to shape its course, thereby changing both social and cultural landscapes.

Opportunities and Risks

In addition to gaps in comprehension, there are many opportunities and risks associated with the rise of the Fourth Industrial Revolution that will determine the extent to which the revolution will affect society. Opportunity lies in the technology that rises with the revolution. These machines and systems will increase the availability of new products and services, augment efficiency and productivity, especially in supply chains and logistics, and further connect individuals, cultures, and industries across the globe. All of this culminates in the revolution's potential to improve the global standard of living with a rise in income levels and the creation of a general sense of empowerment. Conversely, there are many possibilities for negative impacts. As industrial manufacturing becomes increasingly autonomous, many labor markets will find themselves in upheaval, which may create grater inequalities in terms of income and polarize the market into distinct low-skill/low-pay and high-skill/high-pay groups. These inequalities will also be highlighted as the use of social media continues to rise and spread across cultures and communities. There are also a variety of ethical issues that come with the Fourth Industrial Revolution, such as limiting or even outlawing some technologies, like autonomous lethal weapons, monitoring climate alterations so that one nation does not benefit at the suffering of another, and determining the legality of biological enhancements that have the potential to eliminate disease or increase memory power. These risks can be overcome and opportunities maximized as long as all individuals and nations are willing to discuss them. Ethics and human identity and dignity need to be held above all else so that all individuals are able to live healthy, fulfilling lives (Schwab, 2016-a; Schwab, 2016-b; Solomon, 2016).

Impact on Industries

The Fourth Industrial Revolution will have immeasurable societal impact across all industries regardless of discipline. The revolution will disrupt and reinvent supply chains, retail platforms, design, manufacturing, economies, job markets, societal values, and even human thought processes. The true value of the effects is incalculable, but regardless, these industries will have to incorporate the new technological and biological developments brought by the

revolution in order to advance, succeed, and satisfy their consumers, or face imminent extinction. Incorporating these technologies, however, should not feel forced, rather it should evolve organically and feel second nature to consumers. The following briefly examines the impending impact of the Fourth Industrial Revolution on healthcare, transportation, and agriculture, as these three industries have already begun and will continue to play enormous roles in the revolution.

Healthcare In the past century alone, the medical field has seen incredible and rapid advancement, especially in biology. Today, healthcare is being propelled by developments in genetics and robotics (Walker, 2016). 3-D printing, combined with genetics, has already left its mark on the world of medicine with the printing of organs. The printed organs, which are created to be replicas of the patients', are used as models to help surgeons map out their procedures, reducing potential risks and turning inoperable patients into postoperative patients. Two examples of the miracle of 3-D printing are four-year-old Mia, who had an operation on a malformation in her heart, and three-year-old Lucy, who received the first adult kidney transplant (Storrs, 2015; Murgia, 2016). 3-D printing is also spurring advances in microphysiological systems. These systems, which are essentially 3-D printed organs on chips, have programmable sensors that allow for the collection and analysis of data. The chips mirror the structure and function of an organ's tissue, which permits the monitoring of the organ. The information collected can then be used to test the organ's reaction to a multitude of drugs and toxins. This new breakthrough poses as a potential substitute for animal testing (Burrows, 2016). Though these developments are monumental, the real race is on for 3-D printing a transplantable human organ.

Advances in these fields will also heavily impact disease management and caring for the aging population. Sensors connected to the Internet will become commonplace devices, placed in a patient's car, home, or clothing and used to monitor variables such as respiratory and heart rates. From the collected data, the sensor could then determine whether medication or hospitalization would be necessary and alert the patient or his caregiver. Similar sensors would also be applicable to elderly health and could be set with medication reminders, prolonging independence. Mobility, an issue also prevalent in the aging population, has the potential to be resolved or even eliminated thanks to robotics and drones, which will be equipped to perform simple tasks and provide continuous monitoring (Jimenez, 2016). Robotics also has the potential to improve the lives of amputees and paralytics with digitally connected prosthetics that are able to communicate directly with medical professionals through the Internet of Things. These new technologies will change the way in which we view healthcare in terms of location. As reviewed in Melanie Walker's article for the World Economic Forum, the physical where of healthcare is also changing, moving from hospitals to homes. This shift in location is primarily due to the ease in monitoring an individual's health thanks to technology (Walker, 2016).

Transportation Effects of the Fourth Industrial Revolution will also be seen in transportation. Artificial Intelligence and robotics will be the most prominent forces in this field and experts are already making enormous strides in the areas of autonomous automobiles. Google has been developing a self-driving car since 2009, and has already fully functioning prototypes. The cars, which have replaced steering wheels and gas pedals with computers and sensors, are designed for passengers, not drivers. The vehicles are also battery powered, reducing the cars' carbon footprints. Ninety-four percent of traffic accidents in the U.S. involve

some form of human error and each year traffic accidents account for over 1.2 million deaths worldwide. Self-driving cars seek to eliminate these statistics, making driving safe and accessible for everyone, regardless of whether or not they are actually able to operate a vehicle ("How it works," 2016). This would not only reduce the risks associated with driving, but also improve the quality of life for people with disabilities such as blindness or paralysis and return some of their independence.

Despite how far off this particular advancement may seem a world in which self-driving vehicles are on the road is already here. Uber, the on-demand transportation company, launched a fleet of autonomous cars in Pittsburgh, Pennsylvania in August 2016. These cars, which are modified Volvos, use sensors, cameras, lasers, radar, and GPS to transport passengers to their destination. Though the Ubers are still currently supervised by a human in the front seat, the company's goal is replace all of its drivers and already has plans for the creation of a fully autonomous car by 2021 (Chafkin, 2016). If Uber achieves this goal, tension will be created between the company's executives and its employees and they may lose passengers who remain skeptical and untrusting of the new technology. Airplanes are also expected to see expansion in autonomy. A Pentagon research organization is currently developing a robotic co-pilot with skill sets possessed by a human and Boeing's chief officer of technology, John Tracy, believes that the company already possesses the technology and will be able to create autonomous aircrafts for both its freight and commercial customers (Markoff, 2015; Reiner, 2016). As the technology for autonomous vehicles is developed and improved, the concept will certainly spread into other areas such as trucking and public transportation.

Agriculture The Fourth Industrial Revolution will also greatly influence the productivity and efficiency of agriculture. By 2050 the world's population is expected to reach nine billion, requiring seventy percent more food. Climate change, which is making it increasingly hard to grow crops in most environments, accompanied by the world's growing middle class, which with a larger income gravitates toward a diet with more processed meats and dairy, are putting an massive strain on the global supply of food (World Economic Forum, 2016-a; Collins, 2016). The world needs solutions that will help to sustainably feed its population. To promote growth in the agriculture sector and sustainability in its practices, farmers must be connected to the digital realm with have high speed and quality broadband access and innovate with the latest technologies. Agriculture will rely heavily on artificial intelligence, big data computing, The Cloud, and biotechnology in order to survive, advance, and eventually thrive. Artificial intelligence and big data computing are already being used to merge technology for weather, soil, and agronomy for the improvement of productivity and crop yield (Collins, 2016).

Similarly biotechnology and innovations in genetics, such as the perforation of corn seeds, are also being used to enhance crops in their seedling states, thereby increasing crop yield and quality (World Economic Forum, 2016-b). Again, 3-D printing will become an important player in agriculture, as the possibility of printing edible foods is rapidly becoming a commonplace. Natural Machines is one such company that has already created *Foodini*, an Internet connected printer, which is able to print uncooked foods from fresh ingredients. The company hopes to lower the printers price point to $1,000, improve the printer's capabilities by incorporating a cooking process, and link the printers to users smartphones for remote control purposes and the creation of a recipe-sharing community (Prisco, 2014). Innovations like corn

perforation and *Foodini*, are key advances in working toward lowering global poverty rates and promoting healthier lifestyles for all people.

Fashion and The Fourth Industrial Revolution

Effect on the Industry

Historically, the fashion industry has been exceedingly slow to adopt new technologies and incorporate them into fabrics, garments, and retail platforms. The industry is just now adopting innovations from the Digital Revolution and incorporating them into the design, manufacturing, and purchasing processes. For example, last year Rebecca Minkoff incorporated a smart mirror in her SoHo store (Reda, 2015). The company is one of the first to make such technology available to consumers in a retail setting; however, the technology is not very new, as it is essentially a large interactive tablet. The Fourth Industrial Revolution promises to merge all disciplines and connect all industries. Because the fashion involves several disciplines, including design, manufacturing of apparel and textiles, marketing, and retail, it is vital that these industry incorporate the new technologies and processes. The Fourth Industrial Revolution will reinvent the way fashion is created, communicated, and consumed. Supply chains will be wholly revolutionized: from robotic manufacturing to delivery via self-driving trucks. The fashion industry stands to benefit from all of the new technologies, but particularly from robotics, materials science, and artificial intelligence. These technologies will affect manufacturing, textiles, and retailing respectively and are individually explored in the following paragraphs.

Robotics Robotic manufacturing, already present in automobile manufacturing, in conjunction with the Internet of Things, and big data analytics will create smart factories, a concept that is at the heart of Industry 4.0. Machines will be able to perform complex tasks with minimal deviation or error, allowing for nearly complete automation, which leads to high levels of efficiency and quality. Because of the Internet of Things, these robots will also be able to communicate with each other and their human supervisors, creating seamless and immediate communication that allows problems to addressed, improving productivity and continuing efficiency. The rise of machines also means a bigger investment at the outset of manufacturing, but an elimination of hourly wages and "issues" that come with humanity like sleep, injuries, sick days, and holidays (MacDougall, 2014; Hinks, 2015). Companies, such as *SoftWear* and *Sewbo*, are already working on sewing robots, which are slated to return apparel manufacturing to developed countries like the United States. Using robots also has the potential to eliminate sweatshops and lower the mistreatment of workers that runs rampant in the apparel manufacturing industry; however, it will also take jobs, held chiefly by women, out of developing nations, leading to spikes in unemployment and creating economic turmoil (King & Goldstein, 2016; Kavilanz, 2016; McGoogan, 2016). Though the rise of these autonomic factories will be swift, apparel manufacturing is extraordinarily costly and difficult, requiring dexterity that, for now, only human beings can supply.

Materials Science Exploration of the interactivity of textiles is expeditiously gaining momentum. Advances in bio- and nanotechnology are allowing for not only the modification of textiles, but also fibers. Examples of the interactivity of textiles are heating and cooling properties, which go a step beyond moisture wicking by actively cooling a wearer down or

warming them up via an energy source intrinsic to the fabric of his or her garment. Similarly garments could themselves become energy sources. Labs are creating fibers that feature anodes and cathodes, which are the essential components of batteries. The fiber could then be woven into a fabric, creating large complex battery that could potentially charge a mobile device ("BoF VOICES…," 2016; Abnett, 2016). Materials science also involves the development of sustainable fibers and fabrics through biofabrication, such as lab-grown leather. The New York startup Modern Meadow is able to take living animal cells and grow collagen cells to create a leather hide ("Our technology," 2016). This innovation will help eliminate over-farming due to the intense demand for hides and inefficiency due to waste caused by blemishes on the hides as a result of over-farming (Abnett, 2016).

Additional sustainable fibers such as *QMilk*, a fiber made from sour milk, and shrimp chitin, a waste product from the crustacean's shell, are being explored as potential alternatives to natural fibers, like cotton, which involve costly and environmentally detrimental growing, harvesting, production, and dyeing processes. *QMilk*, the fabric of which has a soft silky hand, is made from one hundred percent renewable resources, biodegradable, antibacterial, and resistant to fire ("Our product," 2016; Abnett, 2016). The fiber requires only five minutes and a maximum of two liters of water to produce one kilogram, making it cost, energy, and time efficient ("Our product," 2016). At present, the Massachusetts Institute of Technology is busy working to create a 3-D printer that will use shrimp chitin to produce jewelry that is biodegradable in salt water. This fiber and the merchandise created from it would have endless applications in the fast fashion industry and make this specific sector of fashion, notorious for its wastefulness and negative impact on the environment, more sustainable ("MIT researchers create…," 2015; Abnett, 2016; "BoF VOICES…," 2016).

Artificial Intelligence The use of artificial intelligence will explode in fashion's retail sector. Large amounts of data can be analyzed through AI to create personalized product and gift selections, manage inventory, and provide consumer insight. Since a great deal of retailing has –and will continue to –moved to online shopping, purchases shoppers have made and preferences they reveal are stored by AI systems and can be analyzed to curate a selection of products or gifts that shoppers may unknowingly desire to purchase. As shoppers interact with AI the system is able to learn more about their shopping behaviors and preferences and further tailor their list of product suggestions, finding just the right merchandise to generate sales. Artificial intelligence can also be used to help retailers minimize stock-outs and select their inventories based on data that points to potential bestsellers. *Watson*, an AI system created by IBM, is working to monitor weather, identify purchase patterns and rates, and observe consumer behavior, to better manage supply chains and inventory levels. AI is also assisting in the prediction of consumers' wants and needs, which will help both designers and retailers identify what their customers would like to see in new merchandise or how changing a physical or online store's format would better suit shopping needs. The insight that AI provides will also help marketers to understand what the consumer values and how they can exploit this knowledge to increase sales (Abnett, 2016; Whitler, 2016).

Plans to Embrace

The fashion industry will have no choice but to quickly incorporate all of the new technologies brought by the Fourth Industrial Revolution across its design, manufacturing, marketing, and retail platforms. Fashion is already making some strides in the areas of interactive textiles, wearable tech, and 3-D printing and should continue on this path of embracing the revolution, in order to satisfy its consumers, generate sales, and achieve success.

Interactive Textiles Many companies are working to develop new interactive textiles as the consumer demand for such items grows. As previously mentioned in the discussion of materials science, new technologies and developments in biology, chemistry, and engineering are allowing for the modification of textiles and fibers. Most of the developments in interactive textiles are occurring within small tech-bio startups that focus on fabrics or small apparel companies that have little to no name recognition; however, these firms are slowly partnering with bigger fashion labels, especially in the luxury sector, keeping the collaborations relatively secret. *The Unseen* is a fashion brand that fuses science and creativity to create "magical" materials that transcend the sensory experience. *The Unseen*, which was in talks with a luxury heritage brand, created a color changing leather that alters its appearance based on the temperature, friction, and humidity of the environment that it inhabits (Alleyne, 2015). Since the interactivity of textiles is not limited to only chemical reactions or technological capabilities, fashion will continue to embrace them on various levels across the industry.

Wearable Tech Technology from the Digital Revolution, like microchips and smartphones, have already been incorporated into fashion products such as the *Apple Watch*, *Fitbit*, and *Ringly*, which allow the wearer to use smart technology to monitor heart rate and step count, send and receive text messages or emails, and remain aware of missed phone calls or messages. Building off of its embrace of interactive textiles, fashion will continue its foray into the world of wearable tech, but will move away from stand alone tech pieces –like a watch, bracelet, or glasses –to create garments that function at a more complex level that requires more intimate partnerships with tech companies. For example, denim icon *Levi's* recently partnered with *Google* to create a jacket that allows wearers to access and control their smartphone and its mobile apps by swiping their sleeve. The jacket, which was specifically designed with cyclists in mind, is constructed from a jacquard weave, the fabric of which has intrinsic tech properties in the form of conductive yarns (Abnett, 2016; LS&CO Unzipped Team, 2016; Google ATAP, 2016). Similarly, in 2014 Ralph Lauren's Polo Sport line created the *PoloTech Shirt*, which monitors various aspects of a wearer's health while he is exercising or training. The shirt, constructed of silver fibers woven into the fabric, is able to capture biometric data like respiratory rate, heart rate, stress level, and calories burned and live stream all of the information directly to an *iPhone* or *Apple Watch* via Bluetooth. The launch of the shirt was the first spark in a movement of the luxury fashion industry toward the incorporation of technology in garments ("The PoloTech Shirt," 2016; Atkins, 2015).

3-D Printing Innovations from 3-D printing have been trickling into the fashion industry for many years in the form of shoes, accessories, jewelry, and couture "art pieces," such as Iris van Herpen's skeleton dress. Production has previously been on a very small scale, due to the exorbitant cost of printers and the ineffective manufacturing times. Today, the price of printers

continues to drop and production speeds are constantly being improved upon. Activewear companies like Adidas and Nike are already taking advantage of the technology by offering customized shoe fits through 3-D printing. The fashion industry will embrace this concept of customization via 3-D printing, in order to create differentiation among brands. 3-D printers also have the power to completely disrupt the design to manufacturing process and create a grey area in terms of knockoffs, fakes, and protecting brand identity (Abnett, 2016).

Findings and Plausible Solutions

Areas of Potential Success and Collaboration

The fashion industry will find success through implementing the technologies brought by the Fourth Industrial Revolution across all facets of the industry: design, textile and apparel manufacturing, and retail. Fashion will find particular success in the advancement of materials science and the creation of interactive textiles. Companies can further involve themselves in these processes by joining the Revolutionary Fibers and Textile Manufacturing Institute, which is an innovation hub in Cambridge, Massachusetts. The Institute has reserved $300 million in government grants for an association of 89 manufacturers, universities, and non-profit organizations that are working to develop new materials. Amanda Parkes, who spoke at BoF's VOICES forum regarding the Fourth Industrial Revolution, stated that the institute is looking for involvement from more fashion companies, since the industry brings a unique skill set that includes extensive textile, knitting, and weaving knowledge and high levels of creativity (Office of the Press Secretary, 2016; Abnett, 2016; "BoF VOICES…," 2016). By joining consortiums like the Revolutionary Institute, fashion will be able to collaborate with biologists, chemists, and engineers, which will augment the industry's skills and allow these industries to think about fibers and textiles practically and creatively.

The industry can also continue to build off the success of mass customization by incorporating 3-D printing to create customized fits, accessories, and more, thereby increasing customer satisfaction and creating positive brand experiences, repeat purchases, and brand loyalty. Success can also be achieved through the identification of consumer behavior and exploitation of big data and analytics through the use of artificial intelligence. The increased use in AI will witness more partnerships between companies like *Intel* and the use of their AI programs. Incorporations of biotechnology in garments and accessories will also see increases in collaborations between fashion and healthcare. The diversification of wearable tech will power the success of this collaboration through garments that respond to wearers' physical needs or alert caretakers of important changes.

Educated Predictions

The future of the fashion industry depends on its willingness to actively participate in the Fourth Industrial Revolution. In fashion's future, artificial intelligence will become an essential tool in marketing, retailing, and inventory management. Robotics will eventually push into apparel manufacturing, resulting in a colossal disruption and shift of the job market. AI and robotics will transform supply chains giving rise to new business models and modes of merchandise delivery, such as autonomous vehicles and drones, at both the wholesale and retail

levels. With the continuing deterioration of the environment, the study of materials science will explode within the next ten years, becoming the most prominent effect of the revolution on the fashion industry. This will result in further collaborations with biology and chemistry aimed at increasing sustainability and reducing waste. The Fourth Industrial Revolution will touch all levels of society, fusing engineers and fashion designers, biochemists and textile manufacturers, all while pouring new technology and systems into every facet of every industry. The revolution will redefine what it means to be human and challenge each individual to create a world in which communities across the globe can not only survive, but also thrive, leaving us only to say "Vive la revolution!"

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