The Digital Revolution: A Deeper Look

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The Third Industrial Revolution, more commonly known as the Digital Revolution, marks a major turning point in human history. Previous revolutions have had major impacts, and the trend still follows with the impact that the Digital Revolution has had. The Agricultural revolution was the transition from hunter-gatherers to farmers. The Scientific Revolution gave us new ways to gather and share information. The First Industrial Revolution centered on using water and steam as power sources, while the Second Industrial Revolution focused on mass production using electricity. The Digital Revolution has had an impact that is not only still going on today, even though it started in the late 1900s, but it is serving as the solid foundation for the new Fourth Industrial Revolution, which is introducing artificial intelligence and machine learning. It is the transition from analog to digital systems.

The Third Industrial Revolution is generally considered to have started somewhere in the 1950s, with the invention of the transistor. The transistor was a small electronic device that can either nullify or amplify electronic signals and electric power, which can act as a binary language of having the electric current on or off. This fundamental procedure formed the basis of computer processing, and, in turn, enabled digital computing. A tiny little thing with low energy consumption started the new age of digital technologies, and it is still present in hardware today.
Over the following decades, the technological landscape increased exponentially. We were introduced to integrated circuits, which could fit multiple transistors in a single chip, which made a clear demonstration of Moore's Law. Moore's Law states that every 2 years, computational power doubles, and integrated circuits demonstrated that by not only increasing its computational power, but by decreasing in size and cost, too.

As the late 1970s come into view, we start to see what is more common in our knowledge and understanding of the Digital Revolution. We see the widespread use of the personal computer. To give this computer a way to be more diverse in communication, we see the implementation of the interconnected network that we are familiar with today. That is, to say, we see the use of the internet. This early 21st century invention paved the way for the global scale of digital connectivity. It introduced the World Wide Web, which had the same function as the impact of the Scientific Revolution. It enabled the sharing of knowledge over the network of the internet, and allowed us to access information in a way not demonstrated by sending paper from the printing press around the world, but by clicking a button to send a website or document to anywhere you want. We see that what had started as a tiny spec with three spokes that could turn electric currents on and off had turned into the cultural standards of today
This is what sets the Third Industrial Revolution apart from the others, the fact that the innovations that are being introduced aren't really physical. You can't touch binary. You

can touch steam engines. You can't touch algorithms. You can touch the soil used to grow crops. You can't touch the internet. But you can still touch factories. It's the fact that this revolution's entirety is characterized by the shift from analog to digital systems.

I am arguing that the Digital Revolution was revolutionary because it replaced analogue systems with digital ones which changed the norms of society by transforming communication, production, and the global economy. This argument is based on the following 3 key details. The first key detail is the invention and popularity of computers and the internet, and how it made information technology a key piece in global development. The second key detail is how we use digital and robotic systems for automated manufacturing. The third key detail is how increased connectivity has a social impact on education, work, and social relationships. The significance of this argument is that the Digital Revolution revolutionized how we use technology in our lives and on a daily basis.

This revolution is often referred to as a social/cultural revolution, so we will be analyzing different revolutionary aspects than those that we normally would with a traditional revolution, such as the American Revolution. Social/cultural revolutions usually consist of these following factors: a perceived need for fundamental change, mobilization/participation of people, an ideology that is present or shared by a leader, and a transformation of values or norms. In the following three paragraphs, I will analyze all of these aspects, and in turn prove my argument with the next three details . My first point is that the invention and popularity of both the computers and the internet, along with its impact on IT and global development, is an important factor to the argument of considering this digital shift to be a revolution. Greg Downey states that the Digital Revolution was fueled by the ascent of personal computers in the 1970s. He reflects that, "…in the US, some 37 per cent of all full-time workers (and 18 per cent of part-time workers) are now equipped with internet access in their workplace…"[1] This statement indicates that information technology had become a necessity in the work field. This can be perceived as the "need for fundamental change" revolutionary aspect, proving that in order to be more efficient, workplaces implemented the use of the internet. It also hints at an ideology, that being the matter that "digitality is better for the future, we might as well prepare now." Downey also writes:

> …the latest IT revolution began some time in the mid-1970s, mainly in the US, with the application of microprocessors to a new category of small calculating

[1] Greg Downey, "Commentary: The Place of Labor in the History of Information-Technology Revolutions", International Review of Social History 48, no. 11 (2003): 228, https://www.jstor.org/stable/26405543.

> machines first called "home computers" but later renamed "personal computers" (PCs) as they moved out of the home and into the office.[2]

This statement proves that computers had impacted information technology in a way that it started an entire “IT revolution”. It also emphasizes the fact that most of the population had computers, proven by the cause of the change from their names. This fills out yet another key revolutionary aspect, that of mobilization/participation of the people, by proving the widespread use of digital computers and the internet, especially in information technology to make it a revolutionary invention inside of a revolution. It’s like the printing press in the Scientific Revolution, except you don’t need to meet in person to exchange papers, you can just use a computer and the internet. Robert Hassan also relates the rise of the Digital Revolution to global development, stating, “digital computers began to shape the technological core of the world’s foremost military and economic power, first in defence systems, spreading then into business, and then further into culture and society.”[3] This statement expresses the fact that digitality was integrating into every aspect of life, and propelling global development in doing so. Therefore, the Digital Revolution checks off another box, the revolutionary aspect which is the transformation of values or norms. Digitality overtakes analog in the sense of what is standard, transforming the norms. You don’t really have people come to your house when they find out something urgent to tell you, you have a message on your phone instead.

My second point is that digitality revolutionized manufacturing. Before we had automated manufacturing, we had assembly lines. This analogous form of production was a huge jump in mass production for its time, but manual labor had downsides that included low wages and dangerous working conditions. However, the Digital Revolution has taken care of those cons entirely. Roy B. Helfgott writes about these advantages of automated manufacturing, stating,

> “Improved quality and product reliability are the driving force; the accuracy of the work of a human being varies over the course of a day, but a programmed machine tool will repeat the same operation with flawless and tireless accuracy.”[4]

This statement proves that the integration of digital systems in production improves efficiency and quality. Roy goes on to say that hazardous working conditions are also eliminated with the introduction of these automated machines, as they can keep humans out of harm's way by doing the dangerous work themselves. This results in a

[2] Greg Downey, “Commentary: The Place of Labor in the History of Information-Technology Revolutions”, International Review of Social History 48, no. 11 (2003): 228, https://www.jstor.org/stable/26405543.
[3] Robert Hassan, The Condition of Digitality: A Post-Modern Marxism for the Practice of Digital Life (London: University of Westminster Press, 2020), chap. 3, https://www.jstor.org/stable/j.ctvw1d5k0.5.
[4] Roy B. Helfgott, “America’s Third Industrial Revolution,” Challenge 29, no. 5 (1986): 41, https://www.jstor.org/stable/40721043.

"safer and healthier workplace"[5] and adds more to another key aspect of what makes the Digital Revolution a social/cultural revolution. This is the result of "a perceived need for fundamental change", which was the dangers of human labor in factories. Roy also highlights how the Digital Revolution impacts development in the global economy, stating, "Perhaps the greatest long-run benefit of computer-based technology is that it provides the flexibility needed to respond quickly to market shifts."[6] This quote shows that he is saying that a benefit of using digital technologies is that it is able to respond to market changes quickly. Therefore, automated manufacturing also has a positive impact on the global economy's development. So, automated manufacturing replaced analog forms of labor and in doing so, transformed global production and development in a positive way.

My final point to prove that the Digital Revolution was a social/cultural revolution is that education, work, and social relationships were all positively impacted by the transition from analogue to digital systems. Jan Steyaert and Nick Gould write about how access to digital technology has become "...a very rudimentary indicator of actually making use of digital opportunities."[7] He goes on to say that education is also critically affected, seeing as those who aren't educated on how to use technology to learn are often denied the ability to use the internet for education purposes, and instead go on to use it strictly for leisure purposes. This downside of the internet creates a separate digital divide, inside of the population who do have internet access, between people who are educated with the internet and those who aren't. They also cite in their article,

> "'There was a statistically significant positive association between pupils use of ICT out of school for leisure purposes and decreases in attainment This effect was over twice as large an effect as the positive association o using ICT for educational purposes. In other words, it is not access or general use of ICT per se that could raise attainment, but rather how the technology is used that matters.'"[8]

This proves that the integration of technology in education and schools is fundamental due to the and hints at the ideology that "digitality is better for the future."
Education isn't the only aspect of life affected by digitality, as work was significantly impacted, too. Miodrag Komarčević, Milovan Dimić, and Petar Čelik write in their article:

> "…existing digital channels and means of communication have been a significant worldwide asset for social networks and networking which have erased a need

[5] Roy B. Helfgott, "America's Third Industrial Revolution," Challenge 29, no. 5 (1986): 41, https://www.jstor.org/stable/40721043.
[6] Roy B. Helfgott, "America's Third Industrial Revolution," Challenge 29, no. 5 (1986): 41, https://www.jstor.org/stable/40721043.
[7] Jan Steyaert and Nick Gould, "Social Work and the Changing Face of the Digital Divide," The British Journal of Social Work 39, no. 4 (2009): 740, https://www.jstor.org/stable/23724327.
[8] Jan Steyaert and Nick Gould, "Social Work and the Changing Face of the Digital Divide," The British Journal of Social Work 39, no. 4 (2009): 747, https://www.jstor.org/stable/23724327.

> for a personal presence, physical signatures on paper and classic interviews on the basis of a traditional time measurement approach at interview, with this being replaced by a 'one-to-one' on line digital communications employment procedure."[9]

They are talking about how the Digital Revolution giving digital connectivity has impacted social networks and networking effectively. It overtook analogue routines in the employment industry, such as going to a job interview with a limited amount of time, and replaced it with direct "one-to-one" interviews online. This shift from analogous procedures to digital procedures represents the revolutionary aspects of a social/cultural revolution. It shows the mobilization and participation of employers and employees, the ideology of "digitality is the future," and the transformation of societal norms from in-person to online jobs. Of course, not all jobs are able to be digitalized, but many of those that are thrive. During the COVID-19 quarantine, a big chunk of the population had to work at home, and the Digital Revolution made that possible. Finally, social relationships have also been positively affected by the Digital Revolution. Jan Stayaert and Nick Gould state, "As and when these developments increase and e-products or e-services offer better value, non-connected citizens will indeed be disadvantaged and the diversity in internet access will become a divide, contributing to social exclusion."[10] This quote reflects on how those without internet access will be at a disadvantage from a social aspect compared to those with internet access due to social media requiring internet, creating a social digital divide. This proves the ideology that "digitality is better for the future," furthermore adding to the resume of the Digital Revolution being a social/cultural revolution. So, the Digital Revolution is impacting all social aspects of life, including education, work, and relationships.

There were many outcomes of the Digital Revolution, including the invention and widespread use of the internet, computers, and all other digital systems. They were integrated into daily aspects of life, such as work, school, and relationships, while also being used to optimize global production and diversify the global economy. However, some regions have yet to be affected by the Digital Revolution and its introduction of the internet and computers, resulting in a digital divide, and those who do have internet access have their own divide between those who use it for/in education and those who use it strictly for entertainment. It is also widely thought that this third industrial revolution sparked a new revolution, the fourth industrial revolution, that has the most common point of introducing artificial intelligence. In summary, the many outcomes of

[9] Miodrag Komarčević, Milovan Dimić, and Petar Čelik, "Challenges and impacts of the digital transformation of society in the social sphere," SEER: Journal for Labour and Social Affairs in Eastern Europe 20, no. 1 (2017): 44, https://www.jstor.org/stable/26379907.
[10] Jan Steyaert and Nick Gould, "Social Work and the Changing Face of the Digital Divide," The British Journal of Social Work 39, no. 4 (2009): 745, https://www.jstor.org/stable/23724327.

the Digital Revolution were what brought itself to rise, and it started another revolution by serving as the base.

The significance of this revolution to today's world is as clear as day. We use digital systems every single day, from the time we wake up to our alarm set on our phone, to using a maps app or smart car to drive to work/school, to using computers and the internet to do work and stay socially connected, to the tiny little things that we own with digitality integrated into it. The only thing left for this revolution to be successful in my opinion is to eliminate the digital divide, by becoming a global revolution. Otherwise, the Digital Revolution has touched every aspect of our lives and completely transformed societal norms.

In conclusion, the Digital Revolution, starting with the transistor and introducing the internet and computers, has reshaped human society by transitioning from analog to digital systems. This fundamental shift has revolutionized communication, production, and the global economy, proving that it is indeed a social/cultural revolution. While there are already many positive impacts, the ongoing digital divide demands the need for access to technology worldwide to make the Digital Revolution a successful revolution. So, the Digital Revolution isn't just a part of history; it's part of the present and the future to come.

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