(1) Give four examples from this chapter of a social change brought about by the adoption of a new information technology.

1. **Gutenberg's Printing Press:** Though mistakenly credited with the invention of the printing press (which should really be credited to Korea in the 13th century), Gutenberg's printing press in 1436 was nonetheless a revolutionary invention that made it far easier to spread the written word. It changed religion, fostering the birth of Lutheranism through the scale at which Luther's thesis could be published.

   It also changed the power dynamics within the society, greatly changed science and religion. In "The Spread of Knowledge via Print", McDaniel asserts that the ability of anyone to disseminate information greatly affected the power dynamics of European society. Additionally, it "brought about new innovations and ideas that lead to changes in power and standards in both the religious and scientific areas of European culture" due to its effect on society (1).

2. **Broadband (and Internet):** Broadband, a high-speed internet connection, has allowed a greater sharing of information than ever before. The speed at which information can be shared through faster internet speeds has transformed our society, from opportunities in telehealth, conferencing, communication, and education.

   Some countries have gone as far as declaring broadband a human right. 10 years ago, Finland also declared broadband a legal right, promising a 1mbps connection to every citizen (2).

   With schools that have swung towards online learning models while we are in a pandemic, we are confronted by a change that makes online learning models possible. Now more than ever, widespread access (or lack thereof) of broadband internet will provide or limit the educational possibilities of students worldwide.

3. **Wireless Communication:** The advent of cellular communication has changed our daily lives. The ease of placing a call anywhere, to anyone at any time (so long as they are in a service area), as well as our ability to access the internet, has been transformative.

   As an economic boon, it can be attributed to trillions of dollars of GDP growth and millions of jobs created.

Additionally, these changes have been felt in the developing world, as Quinn asserts, “The social impact of cellular networks has been dramatic, particularly in developing countries“. Cell phones specifically have provided vital sources of market and weather information to African farmers, as well as the ability to procure ‘microinsurance’ to protect crops (5). Pew Research found that education and the economy were believed by participants in the developing world as being areas of improvement from cell phones as well,while at the same time having a negative effect on other parts of society (6).

4. **Cash Registers:** James and John Ritty’s invention of the cash register changed store processes and dissuaded easy crime. By automating and simplifying important accounting tasks that had once been done manually or left forgotten, the cash register found a home in stores. The ease and speed of the register as an adding machine, along with the importance and protection offered by recording transactions, afforded great protection to those who used them. With an automatic tabulation of purchases, embezzlement became more difficult, and store owners could much more easily have an accurate record of accurate store transactions.

(1) McDaniel, Richelle. "The Spread of Knowledge via Print." Disrupting Society from Tablet to Tablet. 2015. CC BY-NC.

(2) “How the Smartphone Has Impacted Economic Development.” *The University of Scranton Online*, 28 Apr. 2016, elearning.scranton.edu/resource/business-leadership/how-the-smartphone-has-impacted-economic-development.

(3) “How the Smartphone Has Impacted Economic Development.” *The University of Scranton Online*, 28 Apr. 2016, elearning.scranton.edu/resource/business-leadership/how-the-smartphone-has-impacted-economic-development.

(4)“Finland Makes Broadband a 'Legal Right'.” *BBC News*, BBC, 1 July 2010, www.bbc.com/news/10461048.

(5) Nierenberg, Danielle, et al. “Five Ways Cell Phones Are Changing Agriculture in Africa.” *Food Tank*, 16 Nov. 2016, foodtank.com/news/2015/01/five-ways-cell-phones-are-changing-agriculture-in-africa/.

(6) Silver, Laura, et al. “Mobile Connectivity in Emerging Economies.” *Pew Research Center: Internet, Science & Tech*, Pew Research Center, 30 May 2020, www.pewresearch.org/internet/2019/03/07/mobile-connectivity-in-emerging-economies/.

Quinn, Michael J. Ethics for the Information Age. Boston: Pearson/Addison-Wesley, 2005.

(2) Some say that no technology is inherently good or evil, rather, any technology can be used for either good or evil purposes. Do you share this view?

To some extent, I share the view that technology itself is neither good nor evil. Most technologies described within the chapter are examples of an amoral or net-positive intent of creation. Creations from entrepreneurial salesmen, thoughtful inventors, and the like.

However, I am particularly conflicted by technologies that are created with the sole intent to harm. If the intent of technology usage matters ("any technology can be used for either good or evil purposes"), then shouldn't human intent in the creation of the technology also matter?

The atomic bomb and its development within the Manhattan project come to mind as an example. The bomb's creation as a tool for instantly ending life, as displayed on August 9th and 14th, 1945, speaks to a creation and usage of a technology that was intended solely for the use of harm. The moment that first bomb dropped, the world was forever changed.

If a technology is created and intended for sole use in inflicting mass death, something largely considered societally immoral, how should we view it? I can accept the bomb's invention and use as an attempt to end the fighting in the pacific theater. But, having visited the remains of the sole-standing building in Hiroshima, I am struck by the cost paid for the hope of peace through a new technology.