#  Sustainability and technology forecasting

Sustainability evaluation is a critical aspect of technology forecasting. Technology forecasting just as the name suggests is the process of projecting the future of a technological invention. Technologies should be futuristic. As such, when planning for a technological invention, one should picture its role in the dynamic world. Sustainability assessment entails evaluating the possible environmental effects of the technology. Technological innovations have multiple implications key among which is pollution. The pollution of land, air, and water through the emission of greenhouse gasses and other hazardous materials often pollute the environment thereby threatening the health and safety of humans. The chemicals also threaten the safety of the environment for other elements in the ecosystem. The emission of greenhouse gasses, for example, have contributed to global warming and the inherent climate change thereby causing adverse weather characterized by long dry spells and serious winters (Bickerstaff, Walker & Bulkeley, 2013).

Sustainability assessment is, therefore, a significant process that innovators among other stakeholders must consider to help them understand the position of their innovation in the future. Gaining such information is critical in safeguarding the profitability and longevity of a new technological product. The sustainability assessment, for example, involved assessing the sources of energy for the technology. Clean and sustainable energy drawn from renewable sources is critical to ensuring the sustainability of technology. Reliance on fossil fuels has caused adverse environmental effects. Furthermore, studies show that oil would soon run out. As such innovators must evaluate such significant aspects of the technology to ensure that the technology will help eradicate some of the adverse effects of previous technologies while safeguarding its longevity in the dynamic world of the future.

## References

Bickerstaff, K., Walker, G. P., & Bulkeley, H. (2013). *Energy justice in a changing climate: Social equity and low-carbon energy*. London: Zed Books.

Topic: Disruptive technology

Disruptive technology is a term in business management that refers to a technological innovation that disrupts the existing market and even creates new value networks and market (Ekekwe & Islam, 2012). Such an innovation displaces existing alliances, firms, and products. Downloadable digital media and streaming technologies disrupted the music and video industries. The two technologies followed the invention of the computer and the internet which presented new technologies. Up to the 1990s, the music and video industries relied entirely on vinyl records like compact disks and digital versatile disks. Consumers did not have any other means of accessing music and videos apart from the vinyl records. The manufacture and sale of the records thus became big business as companies relied on the entertainment industry. The arrival of the downloadable digital media disrupted the market by creating new ways of accessing high-quality music. The new technology created a new market that companies like Apple soon strive to fill. Currently, people prefer downloading music to any other format.

Streaming of vide had similar effects on video rental which was a big business. Most consumers had memberships to video stores where they rented cassettes and disks. Video streaming technology disrupted the market as online vendors provided high-quality content. The video streaming services are cheap and offer high-quality products. The success of the video streaming services rose with a corresponding decline of video rental services thus culminating in the death of the video rental industry and market. The new technologies initiated significant changes in the market as some of the innovative video rental firms soon opened online streaming services to tap into the new market.

References

Ekekwe, N., & Islam, N. (2012). *Disruptive technologies, innovation and global redesign: Emerging implications*. Hershey, PA: Information Science Reference.

Topic: Utterback model examples

Utterback model provides three holistic categories of assessing a technological innovation in a dynamic and comprehensive manner. The three include the fluid phase, the transition phase, and the specific phase. The motor vehicle is a technology that has been in existence for a few decades now. The technology is in its specific phase (Utterback, 1994). The phase comprises of an established industry with dominant design competition shifting systematically from differentiation to a combination of both cost and performance. The motor vehicle market and industry have reached such a level. Dominant brands in each region enjoy significant profitability primarily because of performance and cost. Some of the popular brands of cars include Toyota, Mercedes Benz, Chevrolet, and Nissan among others. Each of the above brands is popular because of their performance and cost. High-end brands like Cadillac and Mercedes Benz offer improved luxury and reliability that justify their high cost. Low-end brands like Nissan and Toyota are popular especially among the middle class because of the low prices.

The manufacture of cars has advanced over the years to involve extensive use of specialized equipment which includes robots that perform complex and repetitive processes integral to the quality of the finished products. Similarly, the industry utilizes highly skilled labor to develop the detailed features of the products. The skilled professionals carry out extensive research to help improve the technology. The strategic consideration of various factors of production has resulted in an established and highly competitive market. A new entrant in the motor vehicle industry is most likely to face numerous challenges since the existing brands have captured the market based on the two critical elements which include performance and cost.

References

Utterback, J. M. (1994). *Mastering the dynamics of innovation*. Boston, Mass: Harvard Business School Press.

Topic: Breakthrough technology

The use of fossil fuels has had adverse effects on the environment for a while a feature that prompted stakeholders to study the alternative and sustainable source of energy. The invention of photovoltaic (PV) technology promised ways of tapping the energy of the sun and converting it into electricity thus providing clean and renewable energy. However, conventional solar cells manufactured using silicon have low efficiency averaging 35%. Technologists have since engaged in studying ways of improving the generation of electricity through solar cells thus developing a breakthrough technology entitled thermophotovoltaics or the hot solar cells (Würfel & Würfel, 2009). The technology converts sunlight into heat before generating electricity. The technology promises to increase the efficiency of ordinary solar panels to about 90% thereby resulting in increased efficiency thus additional electricity to meet the ever-growing demand.

The new technology has adequate staying power that arises from its promise to increase the efficiency of solar panels. Stakeholders in the energy sector have demonstrated an ever-growing interest in the renewable source of energy. The sun is a leading source of energy with some parts of the world receiving substantial sunlight throughout the year. The hot solar cell technology provides ways of tapping into the power of the sun to power both domestic and commercial energy demands. The technology has the potential of eliminating the reliance on fossil fuels especially in the generation of electricity. Furthermore, it has significant economic, political, and cultural influences in the society. It would initiate the creation of new laws and equally new lifestyles as the world moves towards reliance on clean energy. Similarly, it promises to create new economic opportunities and even disrupts the electricity generation industry and energy market.

References

Würfel, P., & Würfel, U. (2009). *Physics of solar cells: From basic principles to advanced concepts*. Weinheim: Wiley-VCH.