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Marselin Diana^a, Ana Kuswanti^b, Ahmad Mulyana^c

^aUniversitas Pembangunan Nasional Veteran Jakarta, Indonesia, marselindiana68@gmail.com

^bUniversitas Pembangunan Nasional Veteran Jakarta, Indonesia, anakuswanti@upnvj.ac.id

^cUniversitas Mercu Buana, Indonesia, ahmad.mulyana@mercubuana.ac.id

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Marselin Diana^{a*}, Ana Kuswanti^b, Ahmad Mulyana^c

^aUniversitas Pembangunan Nasional Veteran Jakarta, Indonesia, marselindiana68@gmail.com

^bUniversitas Pembangunan Nasional Veteran Jakarta, Indonesia, anakuswanti@upnvj.ac.id

^cUniversitas Mercu Buana, Indonesia, ahmad.mulyana@mercubuana.ac.id

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*Corresponding author: anakuswanti@upnvj.ac.id

Abstract

Technological developments have created many innovations that help make human life more manageable. One of these developments is the Bariska Robot presented at the Family Mart Grand Indonesia Store, Jakarta. Even though its existence is welcomed, quite a few feel that it is a threat to humans because it is considered that it can replace the role of the Barista. The presence of robot baristas cannot replace the baristas themselves. Baristas have values that apparently cannot be imitated by robots. In this research, the author used the library research method to collect information according to the needs of this research. As well as using Thomas S. Kuhn's ideas to examine the role of paradigms in the scientific revolution. Which is the basis of the technological changes that occur.

Keywords: Robot, Barista, Paradigm.

1. Introduction

Technological developments influence the development of human survival needs. Society's demand for technology is increasing, so various technologies have emerged to meet these needs. One of the technologies that has developed rapidly in the last decade is information and communication technology. The rapid development of information and communication technology must be connected to human needs for information and communication. In the past, to communicate with relatives in villages or other places, you had to send letters, which took a long time. With the development of telephone and cellphone technology, distance and time can be reduced to seconds. The results in information and communication technology that are also increasingly developing are radio, television, and the internet.

Directly related to the development of Web technology from Web 1.0, Web 2.0, Web 3.0 to Web 4.0, the same thing can also be found in the development of coffee (Alfirahmi, 2019). First Wave Coffee, or the first wave of coffee, is known for its practicality in brewing coffee. At that time, three big brands from America promoted coffee on a large scale. The first wave of coffee received criticism, resulting in the term "bad coffee." Coffee drinkers in the second-wave era want delicious coffee and to know the origins of the coffee they drink. Consumers want to see the coffee roasting process to provide a different taste and experience of drinking coffee. It doesn't stop there. In the second wave, a machine was also created to produce coffee quickly with variations such as café latte, espresso, cappuccino, and French press. The Second Wave era gave way to the Third Wave, which is still relatively new. The term Third Wave Coffee is still relatively new. The time was first introduced by Trish Rothgeb in a 2002 article about Wrecking Ball Coffee Roasters. In an article published by the Roaster Guild, The Flamekeeper, Rothgeb defines three movements in the world of coffee and calls them "waves." This understanding makes "Third Wave" popular today (Yuliandri, 2015).

The development of coffee is mushrooming everywhere, even throughout the world. Europe is a country with very high coffee popularity. Consumers have to spend 5 minutes to brew coffee. This is considered long enough for a coffee shop to make a cup of coffee. Due to

the high demand and the speed of time required, an expert from Italy created a machine that could be the solution to this problem. Angelo Moriondo, a man from Turin, Italy, has succeeded in making his first espresso coffee machine. The coffee machine he created was the forerunner of today's espresso coffee machines. Angelo Moriondo, in 1884, patented an espresso coffee machine. The development of coffee-making devices continues to be developed by various countries by continuing to perfect them.

Several types of espresso coffee machines can be used and adjusted to suit your needs. The first is an automatic coffee machine, usually known for its various conveniences in manufacturing. A coffee maker or barista can use it without special skills. This coffee machine is traditionally favored by home brewers or used in offices. The shape is quite minimalist and practical and only takes a short time. Both coffee machines are semi-automatic. With this machine, the user will have complete control. Users must grind the coffee beans and regulate the temperature, brewing pressure, and extraction time. This machine usually has more complete functions and is widely used by coffee shop entrepreneurs. (dgmarketing, 2021).

The higher the sophistication, the more expensive the coffee machine will be. As time goes by, drinking coffee has become a necessity and a lifestyle. The high demand for coffee made directly from beans is also increasing. This encourages coffee consumption both in the world and in Indonesia. Coffee is a popular drink in Indonesia, with loyal fans ranging from parents to young people. Every year, there is an increase in consumption. Coffee consumption in Indonesia in 2020/2021 has reached 5 million bags measuring 60 kilograms. Indonesia is also the fifth-highest country in the world in the last decade. According to data from the International Coffee Organization (ICO), currently, Indonesia has reached its highest record in coffee consumption (Mahmudan, 2022).

Seeing the evolution of the coffee generation, coffee is no longer seen as just an old man's drink but has become a trend in itself and a lifestyle for young people. So that the status of this activity can be updated on social networks. Suppose you look at the evolution of internet technology and the possibilities offered by social media. In that case, it is unsurprising that many startups and established companies are starting to look at social media as a place to promote their products. The cafe took this opportunity to begin marketing coffee to the millennial generation. Especially considering the trajectory of the coffee company Luckin Coffee in China, which could become Starbucks' main competitor (Alfirahmi, 2019). The increasing trend of coffee consumption is in line with the proliferation of contemporary coffee in Indonesia. The use of technology, high levels of consumption, and changing trends in enjoying coffee have been utilized by memorable coffee start-ups. Memories Coffee in 2021 alone will have 579 outlets spread across 64 big cities in Indonesia. The growth of these outlets proves how high the level of coffee consumption is in Indonesia (Simamora, 2022).

Apart from being a popular drink, coffee can also have benefits that many people may not know about, one of which is that it can reduce diabetes. Murray Mittleman, one of the Doctors at Beth Israel Deaconess Medical Center's Cardiovascular Institute, said, "Studies show that drinking coffee may reduce the risk of type 2 diabetes." The researchers concluded that coffee components can help metabolize sugar in the body and reduce the risk of developing diabetes. Experts show that with every cup of coffee consumed daily, a person's risk of developing diabetes decreases by 7 percent. Several studies have shown this, namely a link between coffee consumption and diabetes prevention (Stella Anggreani, 2015).

In this fast-paced era, and people need quality and instant coffee service, robots are the solution. The use of robots to replace human work has become commonplace. Japan is one country that already has many robots as substitutes for human roles. Japan is also a relatively good robotic developing country (Dewi NK, 2021). In Indonesia, many robots have begun to be used as substitutes for humans, such as shopkeepers, hotel receptionists, and, most recently,

coffee-making robots. As technology advances, various robots are created with special skills or specialization. Robots with certain specifications are closely related to the needs of the modern industrial world. The use of robot technology has another side which is a threat to some people because it eliminates job opportunities. Some of the jobs advertised by robots only partially replace the role of humans (Nurul Aisyah, 2021).

Currently, the development of robots is also increasing in number and variety according to the needs of society. Robots can be controlled to perform various tasks without human intervention. Ideally, robots are expected to be able to see, hear, analyze their environment, and perform programmed actions. Robots are widely used for industrial purposes, especially 3D work, namely dirty, dangerous, and hard. This is done to make human work easier; when the job requires high precision, robots become an intelligent solution, especially when the work poses a serious risk to human safety (Iswari, 2009).

Robots can be divided into 4 based on their function:

a) Industrial robot

It is a robot specifically designed to help with the production process in a factory. Industrial robots are used in manufacturing industries, such as the work of industrial workers in vehicle assembly, welding, etc.

b) Service robot

Service robots are robots whose job is to make human work more accessible. An example of a service robot is the Barista robot designed to serve people when making coffee.

c) Robot Science

Robotic science is a robot designed to assist research for the development of science. For example, research robots sent to Mars are looking for more information about the surface of Mars, the contents of Mars, etc.

d) Robot Entertainer

Children's consumers' favorite robots are entertainment robots. This cute robot was specially created for the exhibition, an icon of cute robots as human friends. One example is the mobile robot. This 1.50 m tall robot from Toyota has 17 computers to control its joints and can play the violin perfectly (Iswadi, 2014).

Japan is the first country to use robots as baristas. This robot, named Sawyer, can make orders by scanning consumer tickets. After that Sawyer will identify and make coffee according to the order. In Indonesia, we are also trying innovations in the world of food and drinks (Miladi, 2018). The presence of a coffee making robot or called the Barista Robot is a robot that functions as a substitute for a barista in a coffee shop. The Barista Robot was first introduced in Indonesia at a Family Mart outlet at Grand Indonesia East Mall, Jakarta. The concept used is self-service. Family Mart provides a new experience for coffee lovers to try having it made by a robot. This innovation emerged because Family Mart wanted to create a contactless service, especially during the COVID-19 pandemic.

The shift from using humans to robots in daily work is also a shift from science. According Kuhn in his book *The Structure of Scientific Revolutions*, it shows there was a crisis of objectivity in the development of modern science due to revolutions and paradigm shifts. Kuhn also stated that scientific progress is non-linear and non-cumulative. As a result, modern science or science has developed through a revolution that has deconstructed old paradigms and replaced them with new ones (Fia Alifah Putri, 2020).

Based on this situation, it turns out to be in accordance with a theory from a philosopher, namely Thomas Kuhn. In his book *The Structure of Scientific Revolutions*, Kuhn shows that there was a crisis of objectivity in the development of modern science due to revolutions and paradigm shifts. Kuhn (Watloly, 2013:343) describes this situation as a "paradigm crisis dominated by a single, established paradigm of normal science." According to Kuhn, scientific progress is non-

linear and non-cumulative. After reaching the peak of its life force, nature is an all-intelligent or empirical science called modern science. As a result, science or current knowledge has developed through a revolution that has deconstructed the old paradigm and replaced it with a new one (Septi Nur Damayanti, 2019).

A paradigm is part of an ancient theory used by scientists as inspiration for scientific practice as a reference for previous work and is presented based on the scientist's testing and interpretation based on the scientific methods used. a complete expression of beliefs, laws, theories, values, techniques, and other matters recognized by members of a society. From the various definitions of existing paradigms, Kuhn divides them into two significant discussions First, Paradigms are examples of natural scientific practices that are accepted, including postulates, theories, applications, and instruments that are born from certain traditions and scientific research. Second, a paradigm is a frame of reference that underlies several theories or scientific practices for a certain period (Sabila, 2019).

Scientific truth changes in revolutionary ways. Science becomes accumulated and systematic learning about phenomena. The development of science is influenced by the development of methods, scientific attitudes, and other scientific facts. Thomas Kuhn divided paradigms into several types. The following is the paradigm and its explanation:

1) *Metaphysical Paradigm*

This paradigm is the broadest consensus and limits the field of study to just one science so that it only focuses on that study in research. This meta-physical paradigm has several functions:

- a) Formulate the problem of ontology (reality/object of study), which is the object of scientific research,
- b) Helping a particular group of scientists to find the reality of the study that is the focus of their research,
- c) Helping scientists find scientific theories and explanations about the objects under study.

2) *Sociological Paradigm*

This paradigm is related to habits, decisions or general rules as a result of research that is generally accepted in society.

3) *Construct Paradigm*

The construction paradigm understands reality, especially socio-cultural reality, constructed from multiple realities (Putri, 2020).

The stage that Kuhn attempted was called the Scientific Revolution. This new paradigm seeks to correct the shortcomings of the old paradigm. Almost all vocabulary, terms, concepts, idioms, personal solutions, ways of thinking, and approaches to problems naturally changed throughout this scientific revolution. However, when old problem-solving models cannot be used to solve later problems, new methods, formulations, and insights are automatically needed to solve new problems arising from advances in science and technology. About expanding human insight and experience itself (Ulfa Kesuma, 2020). Based on the discussion of shifts in science put forward by Thomas Kuhn, the philosopher who initiated the evolution of science. The use of Brista robots is a science development that technology welcomes. This progress is not merely a replacement, but if we look at Kuhn's thinking, changes will exist and be dynamic. Initial scientific developments will be replaced by new knowledge (Sahbana, 2022).

Kuhn also explains that science, like politics and other human practices, depends on history and the scientific community, so the truth about what science means is as revolutionary as politics.

The scientific scheme in Kuhn's conception of paradigm can be divided into:

- a) The pre-paradigm or pre-science stage, where there are no key paradigms,
- b) The stage of ordinary science or ordinary science, in which scientists seek to expand the key. paradigm through the premise of problem solving
- c) Anomalies of the crisis phase or scientific revolution. Abnormalities in normal science

cause crises and give birth to a new paradigm called the scientific revolution process.

d) Paradigm shift or New Paradigm (Komarudin, 2021).

The use of robot baristas has become a topic of interest in the coffee industry, especially in recent years. Even though coffee making has become an integral part of our culture and lifestyle, the use of technology in coffee making has not been fully adopted and accepted by society. However, the introduction of robot baristas may change our view of how we view and experience coffee. According to Thomas Kuhn's view, a scientific paradigm refers to a set of principles and methods that are widely accepted by the scientific community to develop knowledge in a field. When a new paradigm emerges, it can cause a shift in the way we understand and study existing phenomena. In the context of using robot baristas,

Using robot baristas has several advantages compared to human baristas. First of all, robot baristas can produce consistent coffee of the same quality every time it is served. This can increase customer satisfaction and allow business owners to save costs and time. In addition, robot baristas do not need to undergo training or have experience in making coffee, making it an ideal solution for business owners who need reliable and fast staff. Although the use of robot baristas has brought many benefits to the coffee industry, the use of this technology can also pose some challenges. One of the main challenges is the public's reaction to the use of technology in the coffee industry.

Apart from that, the use of robot baristas can also influence the scientific paradigm in the coffee industry. The new paradigm generated by the use of robot baristas could influence the way we understand and develop knowledge in the coffee industry. Understanding of coffee making based on human expertise can be replaced by knowledge of machines and technology. However, the use of robot baristas can also enrich learning in the coffee industry. Barista robots can provide data and information that can help researchers understand more about the coffee-making process and how technology can improve the quality and efficiency of coffee production.

In this scientific journal, we will discuss the use of robot baristas and relate it to the scientific paradigm of Thomas Kuhn. The technological shift that occurred in the world of food and drink, which introduced a robot barista, turned out to be one of the developments in science that was explained by the philosopher Thomas Kuhn. In this research, the author will review the impact of using robot baristas on coffee-making practices, consumer experiences, and public responses to the use of technology in the coffee industry, which goes deeper than using robots as substitute baristas at a Family Mart outlet. This research aims to find out how effective the use of robots as a substitute for humans is and the impact that occurs from the presence of robot baristas.

2. Methods

The author used the library research method (Library Research) in this study. Literature study means data collection techniques by reviewing many journals, news, and various reports related to the problem you want to solve (Danandjaja, 2014). Thomas Kuhn's thinking is used as an analytical approach to see the scientific revolution. The author also uses various sources to fulfill the information needed for this research (Zazkia, 2021).

3. Results and Discussion

Figure 1

Robot Barista Family Mart, Grand Indonesia, Jakarta (Source: kumparan.com)



January 2022 was filled with news and coverage from various content creators, food bloggers, and buyers who came to the Family Mart outlet, Grand Indonesia, Jakarta, regarding the existence of a robot that can make coffee and serve customers just by clicking on the touch screen provided to place an order. Family Mart is the first outlet in Indonesia to feature robots as baristas. Barista robots are a special attraction because they are the latest technological innovation in the Food and Beverage industry. The use of robots as a substitute for baristas has become widely reported in the mass media and has also been featured on YouTube by Food Bloggers. The news, which attracted a lot of praise and made many people curious, turned out to have netizen comments about the robot. Not all netizens feel that robot baristas can help. Not a few also commented on the threat to employment opportunities.

Below are some comments from netizens. "Goodbye humans, welcome robots," uploaded the account @Apa? Apart from that, there were also other comments, "It's been working slowly for a long time, serving just 1 customer can take up to 5-10 minutes, I've bought drinks using this type of robot, but not in Indonesia... because it works slowly, so people queue." "Only 3-4 people, the only ones who were busy saw the demo" from the @one2free account. The account @Dave djamin commented "Haha, there will be a bound demo soon. Eliminating jobs. The one with Aseng. Later it was said that the PKI opened a coffee shop." These comments were taken from the Kompas.com Youtube channel in the Exclusive broadcast! Here's How to Order Drinks Using the Family Mart Barista Robot(Kompas.com, 2022).

The Barista robot at the outlet *Family Mart* reaps many pros and cons, this can be seen from various comments from social media users. Several posts showing the sophistication of robot baristas have made many people worry about the loss of livelihoods, especially for baristas. In fact, if studied more deeply, robots in a field certainly require people who can operate and repair the robot. So, the job is only replaced by a new job. Technology has also created many new areas in the world of work. So, these changes make humans continue to evolve to learn and explore knowledge. The use of robots at Family Mart outlets has also opened up new fields by making employees become software makers for the robot baristas.

The existence of robot baristas is part of a paradigm shift. However, robots can only partially replace the role of humans because there are other supporting aspects, such as comfort, taste, and the value of experience, that robots cannot provide. Technological changes only sometimes run smoothly. Likewise, with the presence of robot baristas from Family Mart outlets, some will give unsatisfactory ratings. The author has provided several examples of responses from netizens. They feel that the existence of robot baristas will threaten the sustainability of the barista profession. Some comment that they think that robot baristas do not provide fast service

or are swifter than a barista. Dissatisfaction with the service from the robot and considering the robot barista to only function as a spectacle.

The development of technology and science is now increasing rapidly. The Covid-19 pandemic has kept innovation in the development of industry and commerce the same. The Covid-19 pandemic has caused people who initially carried out activities offline or face-to-face in their daily lives but have now turned to online. People follow health protocols to maintain a safe distance when interacting. Business people also have to think hard about making innovations and breakthroughs in running their business in the pandemic era. In the world of the food and beverage business, you can collaborate with technology.

In the food service industry, robots are used in various sectors as 'food technology'. Although some of these robots perform basic and routine tasks. In the era of the 4th industrial revolution, food and beverage companies are increasingly adopting artificial intelligence (AI) technology and automated devices, including robots (Seon Hee Kim, 2021). One innovation that can attract a lot of buyers' interest is the breakthrough of a robot that can make a cup of coffee. At first, the combination of a barista and a robot was quite impossible. Robots are programs designed to replace baristas. As we know, robots can only follow embedded programs but cannot follow human tastes (Dewi AO, 2022). It turns out that this innovation has already been developed in countries such as Japan, America, South Korea, the United States, Aabak in Australia, and Monty Café in Russia. Robots driven by artificial intelligence and intelligent applications are expected to increase manufacturing and service operations' productivity, efficiency, and effectiveness (Hye Jin Sung, 2020). So, it is hoped that this robot will attract attention because of its uniqueness and increase sales because it cuts production costs.

Family Mart is a convenience store franchise launched in Japan and expanded to more than 7 countries, including Indonesia. Family Mart offers a variety of groceries, fast food, drinks, bento, magazines, and medicinal products. However, its tremendous success is not based solely on meeting customers' basic needs. In Indonesia, Family Mart is also a place to enjoy delicious and cheap coffee (Roca, 2018). Family Mart introduces an intelligent robot that can make 19 coffee-based menus in just 1-2 minutes. The location currently providing services from robots is Family Mart Grand Indonesia, Jakarta. This coffee is entirely served without any direct contact with humans. Everything is done from the ordering process to payment using only the touch screen provided in the outlet area. So, a process that is so fast, easy, and hygienic can be an attraction in itself.

Family Mart outlets using robot services can produce varied menus, such as Family Milk Coffee, Dolce Latte, Green Tea, etc. The Barista Robot is hoped to increase people's purchasing power in Indonesia. The use of software on the robot barista turned out to be the work of the Family Mart employees. This is also a matter of pride for Family Mart (Suhayatmi, 2022). The robot has been embedded with Artificial Intelligence (AI) in the form of software to operate the requested tasks. Artificial Intelligence (AI) is an artificial system usually considered the same as a computer. Intelligence is created and inserted into a machine (computer) to function like a human. Many fields use artificial intelligence, including expert systems, computer games (games), fuzzy logic, artificial neural networks, and robotics.

Artificial intelligence (AI) is developed in an intelligent robot that can produce delicious products. Robots themselves are a technological development. Technological developments have spread to various aspects, such as intelligence in facial recognition, artificial intelligence, and especially robotics intelligence, which makes it possible to carry out tasks automatically (Jinsoo Hwang, 2021). The use of robots can affect customer satisfaction. Overall, assessing an experience in enjoying a product is a vital aspect that business people pay attention to daily. The assessment of a service refers to the consumer's experience when using a service or product. The presence of robot baristas is considered also to have an influence on customer satisfaction

and the value provided(Young Joong Kim, 2021)

Business development is now centered on the buyer's experience. Many buyers of goods or services want to enjoy a different experience. Nowadays, when we visit a coffee sales outlet, it is not only about the main product offering, but also the experience aspect it offers. The robot barista presented by Family Mart is a new experience for buyers in Indonesia in enjoying coffee blends. There is empirical evidence from many previous studies that satisfaction is a strong predictor of repeat purchases and product or service recommendations. In addition, several previous studies have been conducted in which satisfaction with the product or service was the primary variable of buyer behavior(Seon Hee Kim, 2021).

Barista robots cannot be a replacement for baristas. Robots cannot replace humans because robot baristas cannot carry out the interaction between baristas and buyers. Apart from that, there are many activities that buyers could previously do by interacting with the barista, but these cannot be done with robots. Many also feel that the presence of robot baristas will reduce job opportunities. This was pointed out by netizens on Instagram accounts featuring robot baristas, such as the @jkt.spot account. A barista is a person who works as a brewer and serves coffee drinks to customers. The word barista comes from the Italian word "barimikko" which means "bartender". A barista certainly has unique skills that not everyone can have, namely, the ability to create the taste of a cup of coffee. A barista is a person who defines the taste, experience, and artistic presentation of coffee(Rahel Adelina Hutasoit, 2018). Using robots as a substitute for baristas is indeed an attraction in itself. However, the role of baristas still cannot be replaced by robots because the experience and assessment customers receive will differ between being served by a robot and a barista. Thomas Kuhn's thinking in the scientific paradigm theory can be applied in discussing the existence of robot baristas. Kuhn argued that science does not move linearly but through a scientific revolution involving paradigm changes.

A paradigm is a set of beliefs, values, methods, and techniques that guide a group of scientists in solving problems and answering questions related to a particular field of science. When the old paradigm can no longer answer new problems or questions, a new one will replace it. In the context of robot baristas, the old paradigm in the world of coffee is the process of making coffee which is carried out manually by the barista. However, with the development of technology and the need for efficiency, a new paradigm has emerged, namely the use of robot baristas. The use of robot baristas can provide several benefits, such as reducing the time required to make coffee and uniformity in the quality of the coffee produced. However, the use of robot baristas also raises several problems,

In this context, we can see that there is a paradigm shift in the way coffee is made. The old paradigm which was done manually by human baristas was replaced by a new paradigm which uses robot baristas. This shows that science is not static, but is always moving through scientific revolutions that involve paradigm changes. However, paradigm shifts must also be balanced with critical thinking, considering the advantages and disadvantages of using certain technologies. We must consider robot baristas' social, economic, and environmental impacts and how we can minimize their adverse impacts.

Technology is not a threat to humanity because every change that occurs results from scientific developments. Science is indeed very dynamic and constantly changing. So always make everything towards perfection. Currently, the role of humans is to accept changes in science and technology that will continue to develop and are unlimited.

4. Conclusion

It can be concluded from this research that the presence of a robot barista at the Family Mart Grand Indonesia outlet Jakarta provides a new experience in enjoying a cup of coffee. This is an innovation in technological development. Apart from that, it also answers the

challenges of the Covid-19 Pandemic faced by entrepreneurs. In fact, technology will definitely be needed, but again, it will be adjusted to suit needs. Technology is not a threat, but it makes people innovate. Like the Family Mart robot barista who created the software is an employee of Family Mart. The rapid development of science, supported by technology that continues to evolve, proves that changes will continue. In this way, it is apparent that the role of robots is to help humans work. It will not be a substitute for humans because not all activities, especially those related to service and taste, can be done by robots. This can only be done by humans and will not be replaced.

According to Thomas Kuhn, the scientific paradigm theory can also be used to discuss the existence of robot baristas. The paradigm shift from human baristas to robot baristas shows that science is not static but is constantly moving through scientific revolutions. However, paradigm changes must also be balanced with critical thinking and consideration of the impact of using certain technologies.

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