

## **The Future of Ownership: A Disruptive Scenario**

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**ABSTRACT:** *During thousands of years, ownership was an essential aspiration for humankind, but there are signs that this is changing. This research is studying the disruptive tech-driven businesses which change our attitude toward the ownership. The Horizon Scanning is to identify the weak signals which indicate the disruption in how and what people possess. Analysis of collected articles alluded to the growth of subscription/sharing economy, virtual economy, and tokenization, being recognized as the weak signals which shape the future of ownership. According to these signals, Futures Wheel sessions were conducted to explore the consequences of signals in real life. The final scenario developed in the form of a short story, and it coalesces the hypergrowth of the mentioned signals.*

**KEY WORD:** *Ownership, Futures Wheel, Horizon Scanning, Tokenized Economy, Virtual Economy, Subscription Economy, Sharing Economy, Blockchain, , Scenario Thinking*

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### **I. INTRODUCTION**

Ownership was a key objective for humans and even animals. A person may own a variety of things, and the dominant passion of owning more lands or more foods has sparked many conflicts and wars. However, in recent years the disruptive technologies and innovative business models have impacted the desire for ownership.

The 19th-century researchers have suggested that every human being must have something which is the reward for his labor (Linus & France, 1899). Their research has explained that the tendency to ownership exists even in 3 to 6 months babies, a for months baby cries if the bottle is taken from her, even the bottle is empty. It shows the early signs of ownership. The concept of ownership has existed for thousands of years in all cultures and civilizations (Wahl, 2013), but the things people own have changed during the centuries. For homo sapiens, the ownership was limited to physical goods, but modern humankind possesses the intangible stuff too. According to Fuller (2014), "Anything can be owned if society considers it may be subject to a position of private normative authority over its life." A person usually owns his belongings; whether the object is expensive or not, if he bought them, they are under his ownership.

Furthermore, in the business world, the term "asset" is used," and companies and individuals own both tangible and intangible assets. Nevertheless, we are moving to a world in which the nature of what people own is changing. Also, people are not thirsty of ownership like before, for instance, research of Harris Poll (2019) indicated that the majority of people surveyed wished they could own fewer objects.

Above all, the impact of information technology and computer science on ownership is undeniable. Electronic commerce removed the distance between customers and shops; it facilitates innovation and enabled new business models; it allowed customers to shop any time from any place (Turban et al., 2017). Also, it allowed people in rural areas and developing countries to purchase what they like. High-speed internet allows people to download music and software without visiting the local retailer. All these changes influenced the customer experience of ownership, and this study explores the impact of information technology-driven startups on the future of ownerships.

Moreover, the nature of ownership is changing, and people spend more money on virtual and digital objects. Video games played a significant role here, and they paved the way for virtual ownership. The size of the economy of virtual goods in video games reached \$80 billion in 2017 (IDG Consulting, 2017).

This study contributes by providing the signals of change about the future of ownership, which can be an innovative reference for entrepreneurs, product designers, futurologists, and policy-makers. What's more, the presented scenario can make the possible futures more sensible, which may provoke debates in the community.

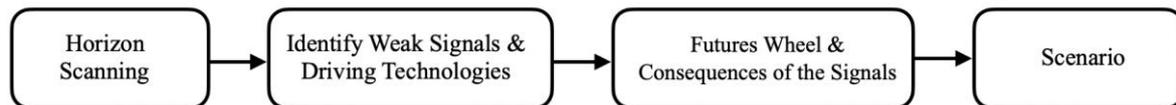
### **II. RESEARCH METHODOLOGY**

In this futuring research, the author aimed to provide foresight about the future of ownership and its possible consequences. First of all, with desk research and brainstorming a list of common things which people own is gathered, these items are :

-House & Office (Property)

- Car, Yacht, Airplane(Transportation Vehicle)
  - Video Games, Music, Movies, Books(Media)
  - Tools, Cloths, Electronic Goods like smartphones and Appliances
  - Collectibles
  - Money & Stocks
  - Intangible Assets: Knowledge, Brand Reputation and Intellectual property which includes Copyright, Trademarks, Patent, (“Leeward Capital Management”, n.d.), (“Squar Milner”, n.d)
- After that, the research method presented in Figure 1 is applied. This model is developed based on (Shyam & Changat, 2017) and adding Future Wheel to discover the consequences.

**Figure 1 :Research Methodology**



### III. IDENTIFYING SIGNALS: HORIZON SCANNING

To investigate the future of ownership for these ownable items, the Horizon Scanning is used. Horizon scanning is a technique for discovering early signs of potential developments of the prospects and it's based on desk research (“OECD”, n.d.). This method involves scanning the sources with certain conditions to identify trends that may influence the future. Sources can include newspapers, magazines, websites, journals. Besides, the signals of changes that may be impactful in the future are usually weak (Shyam & Changat , 2017)..

So the TechCrunch archive was searched for businesses about the mentioned ownable assets in the past five years. Then the articles which demonstrated the change in typical ownership of things were selected. The Fast-moving consumer goods (FMCG) were not considered as objects for ownership. Then according to the found results, the google directory searched for related terms until reaching the theoretical saturation.

First of all, the examination of collected sources, signified that consumers could have access to anything they use every day, from clothes to vehicles through the subscription service. Subscription economy refers to the business model, which instead of creating a product that is sold once vendors sell a periodically subscription, and buyers do not own the product (Thematics Asset Management, 2019). For instance, customers do not buy clothes and buy a subscription plan for clothing (Perez,2018). The growth of this trend can kill ownership of various products.

What if we could rent underused belongings of others? The sharing economy is the answer to this question. It refers to systems that facilitate the sharing of underused assets, for free or for a fee, directly between individuals or organizations (Stephens, 2016). The collected sources indicated that there sharing service for any underused asset.

Moreover, according to investigated sources, all tangible ownable items are influenced by disruptive startups and ventures, but few alterations in ownership of intellectual property were identified. Afterward, the summary of the sources is gathered in Table 1.

Equally important, video games are not just entertaining; their big market is shaping the economy and the nature of ownership. There is a virtual clone of anything users can purchase in reality in the virtual world. A Virtual economy is a rising economy existing in a persistent virtual world, usually in the context of an Internet game (Constantin, 2008). Any virtual world has a virtual economy, and when that economy virtual economy gets massive, in integrates with the real-world economy (Peckham, 2020) .Life simulation games, mobile games, and massively multiplayer online role-playing games (MMORPGs) having the most extensive virtual economies. Lehdonvirta and Ernkvist (2011) recognized that the virtual economy isn't limited to virtual goods and currencies of video game market places, but includes many other intangible commodities such as digital labor.

An approximated 100,000 young low-skilled workers in countries like China and Vietnam earning comes from harvesting virtual resources and providing player-for-hire services (Lehdonvirta & Ernkvist,2011), so the virtual economy is more serious than it seems to be. Extended Reality is recognized to be a technology enabler for the growth of the virtual economy. Extended Reality (XR) is an umbrella term that encompasses augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR). Augmented Reality mixes the user's experience of the real world with virtual elements, but VR tries to block the real environment and replace it with virtual objects (Chuah,2018). Mixed Reality is the area between the two extremes in Reality-Virtuality continuum (Milgram et al.,1995). The merger of real-life with computer-mediated realities can expand the virtual economy immensely.

The other observed signal is the tokenization of assets, which refers to the process of issuing a blockchain that digitally represents a real tradeable asset (Laurent et al.,2018). A token can represent ownership of an asset; it can be a share in a company or a unit of an alternative asset such as wine or artwork. Creating a new token is as easy as creating a new blog, so people can mint a new token for anything they consider as an asset.

Blockchain is similar to the internet, and it can impact the world in the way the internet has changed. Blockchain is an open global infrastructure that allows users to make immutable transactions. This technology allows a digital ledger of transactions to be created and shared between distributed computers on a network. The ledger is not owned or controlled by one central authority or company and can be viewed by all users on the network (Underwood, 2016).

When a user wants to add a transaction to the ledger, the transaction data is encrypted and verified by other computers on the network using cryptographic algorithms. A new block of data is added to the chain and shared by all on the network if there is consensus among the majority of computers that the transaction is valid (Underwood, 2016). This is important to note that the technology behind blockchain is not hardly accessible, and with the help of open-source tools, users can create their own blockchain in a few minutes.

In brief, these trends are impacting the ownership:

- The boom of Subscription Economy & Sharing Economy
- The merger of Real life and Virtual Worlds which leads to expansion of Virtual Economy
- Tokenization of Assets

Besides, content analysis of sources indicated that Blockchain, Extended Reality, Video Games, High-Speed Internet, and Apps are technology enablers for mentioned change signals.

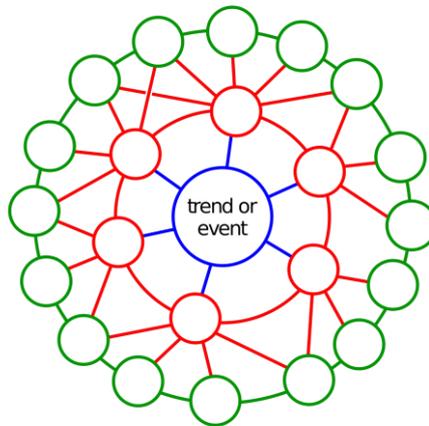
**Table 1 :Summary of Sources**

Item	Change in Ownership	Technology	Economic Model	Summary
Home	Yes	Apps	Subscription Economy, Sharing Economy	You don't need to own a home, and "home" doesn't have to be tied to one location(Milanovic, 2016)
Car	Yes	Apps	Subscription Economy, Sharing Economy	Luxury customers can subscribe for on-demand delivery of a top-level Cadillac (Etherington,2017). Uber has emerged as a leader in the "sharing economy", it provides ride sharing service that matches willing drivers with customers looking for rides( Chen, Mislov & Wilson, 2015).
Yacht	yes	Apps	Sharing Economy	BoatSetter is a peer to peer boat rental startup. More people can have access to yacht (Constine, 2017)
Office	yes	Apps	Sharing Economy	Alma is a WeWork for therapists, but it also provides them matchmaking service, which connects them to patients (Loizos, 2019).
Airplane	Yes	Apps	Subscription Economy	unlimited private jet flights for \$1,950 a month (Milanovic, 2016)
Movie	yes	Apps, High Speed Internet	Subscription Economy	Customers pay a monthly fee and get access to a nearly endless archive of on-demand, TV and movies(Hendricks, 2013)
Music	Yes	Apps	Subscription Economy	Customers pay a monthly fee and get access to a nearly ultimate library of music(Hendricks, 2013)
Video Games	Yes	High speed Internet	Subscription Economy	The Microsoft Xbox Game Pass allows players to play more than 100 games with a monthly subscription (Dilet, 2017). However, they do not own any video game, after all
Books	Yes	Apps	Subscription Economy	Scribd sells e-book & Audio Book subscription (Ha, 2019)
Tools	Yes	Apps	Sharing Economy	Streetbank.com connects neighbours who want to borrow, lend or share possessions, which means users do not need to buy items they would hardly ever use("Al Jazeera", 2011)
Electronic Goods	Yes	n/a	Subscription Economy	Apple is reportedly developing a subscription service model for its hardware, including iPhones(Engle, 2019). In addition there is startup called SmartSub which provides smartphone subscription program with yearly upgrades(SmartSub, 2019).
Cloths	Yes	Apps, Blockchain	Sharing Economy, Subscription Economy, Tokenization, Virtual Economy	Gwynnie Bee, a subscription service offering an "unlimited closet" of clothing for rent, believes its model can be expanded to traditional retailers. Also, they provide a new technology platform that will allow retailers to offer a subscription clothing rental business alongside their existing channels. The name of the platform is CaaStle – the title referencing "Clothing as a Service"(Perez,2018)

Collectibles	Yes	Blockchain, Extended Reality	Tokenization, Virtual Economy	<p>With the rise of the ERC-721 token standard, new digital collectibles or tokenized goods, have changed the collectible ownership market. Specifically, non-fungible tokens are revolutionizing digital asset ownership. NFTs allow for the complete ownership of tokenized goods: Collectors own their tokenized goods in perpetuity and can trade their tokenized goods at will(Wood &amp; Lindman, 2018).</p> <p>High fidelity startup used blockchain tech to provide a way for users to own the digital VR goods they've purchased, tying their digital goods to a digital persona so that they can use it other VR worlds. Their Digital Asset Registry does this all in a decentralized capacity (Matney, 2018).</p>
Jewelry	Yes	Apps	Subscription Economy	Switch sells a subscription that provides access to designer jewelry(Seaver, n.d.)
Brand Reputation	No	Blockchain	N/A	Incorporating a Proof-of Individuality framework within the verification system will also help guard against Sybil attacks, which involves forging multiple identities to manipulate reputation scores, for example (Lee, 2018).
Knowledge	N/A	N/A	N/A	Not significant results found.
Trade Secrets	No	N/A	N/A	Not significant results found.
Money	Yes	Blockchain, Video Games	Virtual Economy, Tokenization	In the game design, Virtual Currency is made for the internal economy of video games to control the game mechanics. With the release of online video games, users became able to trade items, combining virtual Currency with real money (Asadi & Hemadi, 2018). Moreover, the blockchain-based virtual currencies, known as Cryptocurrencies, developed outside the gaming world, and the market capitalization of cryptocurrencies reached 237.1 billion in 2019 (Szmigiera,2020).
Intellectual Property	Yes	Blockchain, Extended Reality	Tokenization, Virtual Economy	Cappasity is a decentralized AR/VR ecosystem for 3D content exchange. Blockchain's role here is in allowing 3D content creators to produce, rent and sell AR/VR content through the Cappasity marketplace. Tokenization prevents copyright infringement(Foundry, 2019)
Stocks		Blockchain	Tokenization, Virtual Economy	DX.Exchange provided first system for trading securities as tokens (Khatri,2019) ,but the impact of blockchain in Stocks is more than tokenization of current stocks. Initial public offerings(IPO) usually create buzzes in the financial markets. With Blockchain technology, a similar tool has created. An Initial Coin Offering (ICO) is a fundraising tool that trades future crypto coins in exchange for cryptocurrencies of the immediate, liquid value(Wilhelm, 2017). The Economist (2017) described ICO coins as digital tokens issued on an indelible distributed ledger, or blockchain, of the kind that underpins bitcoin, a cryptocurrency. That means they can easily be traded, although unlike shares they do not confer ownership rights. For instance, Orchidlab, which provides a decentralized VPN service, has raised \$43 million on ICO (Dale, 2019)
				<p>Wardrobe, a new peer-to-peer fashion rental marketplace (Crook, 2019)</p> <p>A digital dress sold for \$9,500 on the blockchain. It's not like buying a costume in a video game -- the designer tailored it for buyer based on a photo, and its nature as a blockchain asset both makes it unique and gives it value like cryptocurrency (Fingas, 2019).</p>

IV. FUTURES WHEEL AND THE CONSEQUENCES OF SIGNALS

Figure 2: Futures Wheel



The Futures Wheel was introduced by Glenn (1972). This method is useful for identifying the potential consequences of events, trends, or signals through structured brainstorming. At the center of the Futures Wheel is a trend or a signal of change (Figure 2). Participants offer their ideas about the multi-level consequences of the selected trend. According to Bengston (2015), a Future Wheel exercise is unlikely to produce valuable insights if all participants think similarly. In this research, 12 individuals from different fields and majors have participated. They are from the countries of Iran, China, Canada, Germany, Sweden, and Netherlands. Sessions were conducted through a combination of Google Form and WhatsApp call. So that, participants were asked to write down first order and second-order consequences for the exponential growth of Subscription/Sharing Economy, Virtual Economy, and Tokenized Economy. Subscription and Shared Economies are merged as one trend because a combination of sharing economy and access economy allows people to pay for their usage instead of ownership, which Danco (2015) called it Access Economy. As a result, the summary of collected consequences were gathered which available in Table 2.

Table 2: Summary of Features Wheel Sessions

Signal of Change	First Order Consequences	Second Order Consequences
Subscription/Sharing Economy	Fewer people will own the world.	A small group of investors will control the world, chaos and riots
	Maintaining the quality of goods will be very important.	New Knowledge and Academic Fields
	Less Consumption	Unemployment, recession, elimination of resellers.
	Fall of Manufacturing	Unemployment, Weakening buying power
	Lower prices	Reduction of the Cost of living, Product Variety
	Shared Use of Objects	Poor hygiene and epidemic infectious diseases, New Disinfection methods
	New Type of Jobs	Opportunity for small businesses
	Fast and New Recycling Technologies	Better environment for future generations, New Jobs related to recycling, growth of remanufacturing related jobs
	More people will have access to various leisures that were available only to wealthy families.	Better life quality
	No Ownership	During the economic crisis, people will have no assets. They even can't live in their cars because they don't own their vehicles. They will have nothing to sell. The community will have less debt because they pay just for access time.
Virtual Economy	Transition of private to public services: in some countries, government may become the major provider of these services.	More manufacturing, Less Unemployment in short term, huge debts in long term. Less privacy and more surveillance and less freedom.
	Exponential growth of technology	More Space Exploration, New Generation of AI
	Less Transportation	less carbon emission, Fall of Oil market
	When the majority of things becomes virtual, the resale of owned item will be less profitable	Central banks become more powerful
	It will be hard to hide what we own	Less Privacy

	We won't pay for many things	Massive unemployment
	Collapse of Economy	Tech companies dominate the world. There will be few chores to do to earn money. Manufacturing will fall. People won't have money to pay. There will be free versions of anything, so even the digital artist may become bankrupt.
	World Without Borders, Change in definition of location. The physical borders and distance become meaningless.	It will be hard for dictators to control the virtual worlds. If people spent most of their time in the virtual world, the power of suppressing governments would vanish.
	New Economic Paradigm	-People will get a fixed monthly payment because the majority of people don't work. Humanity will search for new ambitions. -They can shift physical resources to use in more pioneering goals, like the colonization of space. -The population of researchers will increase to serve these new objectives.
	New Architecture to serve virtual layers and virtual realities	New Technologies, Holographic Video Projectors will replace traditional lighting
	New Cybercrimes	The emergence of thieves who steal virtual goods.
	Isolation	Addiction to virtual contents, mental illness
Tokenized Economy	Democratization of finance	More people become investors, New Type of Businesses, More access to Financing
	New exchange markets for the new valuable tokens	New possessions, new websites, journals and channels to cover the news of these new markets -Tokenization of Tasks, Equipment and Machines
	<b>First Order Consequences</b>	<b>Second Order Consequences</b>
	New Frauds and Scams	New Regulations related to these new crimes, new organizations to stop these crimes.
	Exchange of Intellectual Property	Better life for innovators, Intellectual property crime becomes difficult
	Peer to Peer Trade without the participation of notary office	Increase in the number of transactions, more volatile markets
	Machine to Machine Trades	Emergence of Self-sustaining droids
	Transparency In public ledgers	New Mass Surveillance Projects by Governments

V. SCENARIO

Scenario is a story that illustrates visions of a possible future (“Scenario Method”, n.d.), and it can take the form of a short story, a news article, a comic, a film, a documentary about the future (McGonigal, n.d.). In this research, the author synthesized a comprehensive short story entitled “Tempo of life” as the final scenario, based on the following mini-scenarios:

1. "ServiceLords" Governments, big companies, and few wealthy families own the whole world, and people can have access to their services. The general cost is low, but most people own nothing; they spend all of their income on services.

2. "Virtually Rich Citizens" In this world, people access their desires in virtual worlds, so it let them pay less for experiencing their dreams.

3. "Tokenized World" There are countless number of tokens in the world people can trade. The financing is fully democratized, and any individual can run a trading venue. Additionally, the general public owns the tokens related to a variety of ventures and intellectual properties. It helps them to possess a saving for a rainy day and get an extra income.

Additionally, the final scenario explores following themes which are based on the outcomes of the Futures Wheel sessions:

- Technological Unemployment
- Hypergrowth of AR/VR
- Democratization of Finance

It is worth mentioning scenarios should be provocative because a provocative future encourages others to shape their future (Musto, 1995). Also, it may help people to feel the unexpected threats and opportunities in such a future. So in this study, the author tried to exaggerate the future to make a better inspiration, the short story may not comply with the current local laws, but the author made such a world to show the consequences of the identified trends.

**Tempo of a life - New York, 2030**

*While Tiffany was getting ready to celebrate her 30th birthday, she received a great gift two weeks before that, when her employer had her fired! The worst gift a person can get! Tiffany joined a market research company as a legal analyst five years ago. She did not come from a wealthy family, her mother was a cashier,*

and her father left them when she was a baby. Her salary was below the average in the industry, but her quality of life was better than her mother. When she was a teenager, they were searching for an outlet offer so hard, but since she reached that, her life changed dramatically.

First of all, with an extra discount the company provided her, she got subscribed to a professional attire subscription. At the end of each season, the clothing company used to collect the clothes and replace them with new designs. Additionally, she got subscribed for two more apparel subscriptions, one for party dresses and another one for the undergarments.

She used to have fun with her friends, and there were small parties in the boats. The price of access to yacht ride, an experience which used to be a luxury, was decreased dramatically because of the yacht sharing startups. This time, the situation has completely changed. The Human Resource department of the company, where she used to work at, has implemented a new Artificial Intelligence Algorithm. This algorithm recognized her as a threat to organizational integrity culture. Even though they did not send her a warning letter, they said: "the algorithm found her a risk for their company, and there is no process for an appeal". As soon as they fired her, she lost her line of credit, the financial firm notified subscription companies, and they came to collect their goods and made her withdraw all of the bank accounts as the cancellation penalty. Even they seized her socks!

Endless problems; all agents of service provider companies came after another to capture her possessions. Now, she does not have a rental agreement and is living in a subscription-based studio, which allows her to accommodate in different places. So, they revoked her access to accommodation. The good point was that she owned nothing to be worried about moving them because if she was in need of something, she could rent it from peer to peer rental applications. The eviction occurred very fast. She was sitting at the park near to her residential area with a blanket covering her an old backpack from her college era. She was so shocked that she cannot even cry. But there is one more bad news, she was subscribed to her smartphone, and she did not buy it, so the private law enforcers tracked and seized her smartphone too. Now she cannot call her friends for help if needed. Suddenly, she saw a spark of hope, there was an old tablet in her backpack! She connected to Wi-Fi hotspot of the park and sent an email to her friends with her location. She remembered one of her best friends who was her colleague as well. Does Karishma know about the algorithm? She may avoid her to keep the algorithm satisfied. After an hour, Tiffany reached to her with an autonomous car, an application that used to provide ride-sharing services, have manufactured autonomous vehicles, and fired its drivers. Algorithms killed their jobs, and Tiffany was not the only person who lost her job by an algorithm.

Vivienne, who was living with her parents, took Tiffany to her townhouse. On the way to her home, she heard about the tragedy, dizziness made them inarticulate. Karishma did not answer her, not because of the algorithm, but because she had been sleeping in a flight in another continent, and did not know anything about the fall of Tiffany.

Tiffany did not want to be a burden for Vivienne's family, so trying to leave their home soon. No place to go, no willing to tell her mother about this crisis, no savings, she spent all of her money to pay back her student loan debt and buying services and needed to find a place and work as soon as possible. She tried job search websites, but there were few empty positions and tons of jobless persons. She accidentally opened one of the old games she used to play years ago, and she got surprised. Did she receive more than a hundred messages in that game, why? She had discovered a unique virtual treasure in one of the quests. She does not know about the importance of this virtual asset. The game became famous after she left the game, and virtual item collectors were willing to pay thousands of dollars to have this item in their chest. She could sell the item for ten thousand dollars, now she could breathe easier.

Vivienne's father had bought a minivan in 2018. Still, after a few years, he started to use autonomous minivans by paying for the time he used. Autonomous minivan allowed him to have more time with his family during the vacations, and he needed to spend less. Additionally, the service provider recycles and rebuilds their minivans every year to compete with other prominent service providers. Tiffany wanted to purchase that old car, but Vivienne's father resisted and said, "Keep it as long as you need it." Now, if she ran out of money at least, she would not be without shelter, she can stay in that car.

One week is left to her 30th birthday, Karishma returned to New York. She apologized that she was not with her in a hard time, Karishma worried that the New AI is killing her privacy. Tiffany recognized that while she was busy with that company's daily tasks, she lost track of technology. When She was looking for a job, she found that a small oil-producing country in Persian gulf wanted to use AR/VR technology to create political hegemony. Previously, they bought one of the largest AR/VR Platforms, and now they are providing free VR headsets and suits to every worker. They wanted to bring companies and organizations to abandon their offices and use virtual offices in the platform. This king knew he cannot relocate all the world's companies to his country, but he wanted to have them virtually. Tiffany will start working there soon; the salary is not that good, but she does not need to spend money on transportation. This time she rented a Computer-mediated reality

compatible unit for living. These residential units are small, but they are designed to provide the best experience with sensors and VR accessories. Tiffany does not go to the home decor store to decorate the home, now she can decorate her house with virtual objects. The house is small, but it is bigger than mansions when you live in its VR.

Now everything is on track to have a good birthday party. Tiffany passed the worst of times, and she was going to experience the best of times. There is one more happy news to hear. One day before her birthday, she saw Saam on an online news channel. Saam was her classmate in college. Two years ago he asked her to buy tokens of share in his learning machine algorithm. She did not think of the probability of the success of her investment. She just wanted to help her old nerdy classmate. Surprisingly, the Federal government announced that they are going to use this algorithm. The journalists were interviewing him about his success and the value of her shares has increased by 1500% in just one day! Happy Birthday, Tiffany! Are you ready to kill more jobs?

## VI. CONCLUDING REMARKS

This study explored the plausible changes in getting access to things we usually use and the possible consequences of such changes in our life and society. The results of Future Wheels revealed the details of the implementation of the trends that could make a huge difference. For example, we see both the fall of manufacturing jobs and the growth in the jobs related to remanufacturing. A participant argued that the subscription economy would increase recycling, and the companies need to keep pacing with each other, so they recycle their products to manufacture new products. Additionally, the lower costs for customers increases the total number of customers, which leads to the growth of jobs. However, other participants stated that people would use a product for long years as it lowers the costs for service providers. There are no right or bad signals of change, but the way we apply the changes is critically important. Similarly, the scenario tries to show both opportunities and threats of each signal. And of course, such signals and consequences can make other stories, getting interconnected with other trends, and being the topic of other researches. Another equally important future research is to create design fictions based on the provided story world

Finally, the combination of discovered disruptive businesses, signals, and mini-scenarios can provide the authorities and policymakers inspiration about the future. Besides, the story can also facilitate discussion about the impact of the current trends in businesses on the economy's future.

### Companion Website

The companion website to the article can be found at the following address: <http://futureportal.org/ownership/>

This site contains information and links related to the latest signals of change and artifacts about the future of ownership.

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## REFERENCES

- [1]. Al Jazeera. 2011. "Local Hero: Sam Stephens." Retrieved May 25, 2020 (<https://www.aljazeera.com/programmes/earthrise/2011/11/20111117151637406294.html>).
- [2]. Anon. n.d. "Scenario Method." Retrieved March 20, 2020 (<http://www.foresight-platform.eu/community/forlearn/how-to-do-foresight/methods/scenario/>).
- [3]. Asadi, A., and R. Hemadi. 2018. "Understanding Virtual Currencies in Video Games: A Review." Pp. 109–17 in 2018 2nd National and 1st International Digital Games Research Conference: Trends, Technologies, and Applications (DGRC).
- [4]. Bengston, David. 2015. "The Futures Wheel: A Method for Exploring the Implications of Social–Ecological Change." *Society & Natural Resources* 29:1–6.
- [5]. Chen, Le, Alan Mislove, and Christo Wilson. 2015. "Peeking Beneath the Hood of Uber." Pp. 495–508 in *Proceedings of the 2015 Internet Measurement Conference, IMC '15*. New York, NY, USA: Association for Computing Machinery.
- [6]. Chuah, Stephanie Hui-Wen. 2018. "Why and Who Will Adopt Extended Reality Technology? Literature Review, Synthesis, and Future Research Agenda." *Literature Review, Synthesis, and Future Research Agenda (December 13, 2018)*.
- [7]. Constantin, Ionuț, and others. 2008. "The Impact of Virtual World Economy in Real World Economy." *Manager* (07):39–45.
- [8]. Constine, Josh. 2017. "Airbnb for Boats." Retrieved April 20, 2020 (<https://techcrunch.com/2017/08/17/peer-to-peer-boat-rental/>).
- [9]. Crook, Jordan. 2019. "Wardrobe Picks up \$1.5 Million for a New Fashion Rental Marketplace." Retrieved May 11, 2020 (<https://techcrunch.com/2019/11/06/wardrobe-picks-up-1-5-million-for-a-new-fashion-rental-marketplace/>).
- [10]. Dale, Brady. 2019. "Orchid Tops \$43 Million Raised in Token Sale for Crypto Tor Alternative." Retrieved May 22, 2020 (<https://www.coindesk.com/orchid-tops-43-million-raised-in-token-sale-for-crypto-tor-alternative>).
- [11]. Danco, Alex. 2015. "The Rise of the Access Economy." Retrieved April 29, 2020 (<https://alexdanco.com/2015/02/02/the-rise-of-the-access-economy/>).
- [12]. Dilet, Romain. 2017. "The Xbox Game Pass Is a \$9.99 Spotify-like Game Subscription." Retrieved February 21, 2020 (<https://techcrunch.com/2017/02/28/the-xbox-game-pass-is-a-999-spotify-like-game-subscription/>).
- [13]. Engle, Emily. 2019. "Apple Reportedly Exploring iPhone Subscription Model." Retrieved April 19, 2020 (<https://hypebeast.com/2019/10/apple-rumored-iphone-subscription-model>).

- [14]. Etherington, Darrell. 2017. "Cadillac's Book Is a Subscription Car Service." *TechCrunch*. Retrieved May 15, 2020 (<https://techcrunch.com/2017/01/05/cadillacs-book-is-a-subscription-car-service-that-gives-luxury-customers-options/>).
- [15]. Fingas, John. 2019. "A Digital 'dress' Sold for \$9,500." Retrieved February 29, 2020 (<https://www.engadget.com/2019-05-27-fabricant-blockchain-digital-dress.html>).
- [16]. Foundry. 2019. "AR and Blockchain...an Unstoppable Combination?" Retrieved May 21, 2020 (<https://www.foundry.com/insights/vr-ar-mr/ar-and-blockchain>).
- [17]. Fuller, Dan. 2014. "Ownership as Authority." *King's Student L. Rev.* 5:16.
- [18]. Glenn, Jerry. 1972. "Futurizing Teaching vs. Futures Courses." *Social Science Record*.
- [19]. Ha, Anthony. 2019. "Scribd Raises \$58M for Subscription E-Books and Audiobooks." Retrieved February 4, 2020 (<https://techcrunch.com/2019/11/25/scribd-spectrum-equity/>).
- [20]. Harris Poll. 2019. "5 Trends Driving End of Ownership and Growth of Subscription Economy." Retrieved March 25, 2020 (<https://www.zdnet.com/article/5-trends-driving-the-end-of-ownership-and-the-growth-of-the-subscription-economy/>).
- [21]. Hendricks, Kevin. 2013. "OWNERSHIP VS. SUBSCRIPTION ECONOMY." Retrieved March 21, 2020 (<https://www.kevinhendricks.com/2013/03/12/ownership-vs-subscription-economy/>).
- [22]. IDG Consulting. 2017. Quarterly Report March 2017.
- [23]. Khatri, Yogita. 2019. "Nasdaq-Powered Crypto Platform DX.Exchange Shuts down; on Lookout for Merger or Acquisition." Retrieved February 5, 2020 (<https://www.theblockcrypto.com/post/45672/nasdaq-powered-crypto-platform-dx-exchange-shuts-down-on-lookout-for-merger-or-acquisition>).
- [24]. Kline, Linus W., and C. J. France. 1899. "The Psychology of Ownership." *The Pedagogical Seminary* 6(4):421–70.
- [25]. Laurent, P., T. Chollet, M. Burke, and T. Seers. 2018. "The Tokenization of Assets Is Disrupting the Financial Industry 6." URL [www2.deloitte.com/Content/Dam/Deloitte/Lu/Documents/Financialservices/Lu-Tokenization-of-Assets-Disrupting-Financial-Industry.Pdf](http://www2.deloitte.com/Content/Dam/Deloitte/Lu/Documents/Financialservices/Lu-Tokenization-of-Assets-Disrupting-Financial-Industry.Pdf) (Accessed 6.3. 19).
- [26]. lee, Sherman. 2018. "A Decentralized Reputation System: How Blockchain Can Restore Trust In Online Markets." Retrieved February 21, 2020 (<https://www.forbes.com/sites/shermanlee/2018/08/13/a-decentralized-reputation-system-how-blockchain-can-restore-trust-in-online-markets/#70b74337481a>).
- [27]. Leeward Capital Management. n.d. "INTANGIBLE ASSET FINANCE 101 – WHAT YOU SHOULD KNOW ABOUT FORMAL & INFORMAL IP." Retrieved March 27, 2020 (<https://leewardcapitalmgt.com/intangible-asset-finance-101/>).
- [28]. Lehdonvirta, Vili, and Mirko Ernkvist. 2011. Knowledge Map of the Virtual Economy: Converting the Virtual Economy into Development Potential. World Bank.
- [29]. Loizos, Connie. 2019. "While People Puzzle over WeWork, Niche Co-Working Spaces Continue Gaining Traction." Retrieved May 2, 2020 (<https://techcrunch.com/2019/06/22/while-people-puzzle-over-wework-niche-co-working-spaces-continue-gaining-traction/>).
- [30]. Matney, Lucas. 2018. "VR Blockchain Startup Founded by Second Life Co-Creator Raises \$35M." Retrieved March 3, 2020 (<https://techcrunch.com/2018/06/28/vr-blockchain-startup-founded-by-second-life-co-creator-raises-35m/>).
- [31]. McGonigal, Jane. n.d. "Forecasting Skills," Institute for the Future.
- [32]. Milanovic, Nik. 2016. "Life by Subscription." *TechCrunch*. Retrieved March 5, 2020 (<https://techcrunch.com/2016/03/18/life-by-subscription/>).
- [33]. Milgram, Paul, Haruo Takemura, Akira Utsumi, and Fumio Kishino. 1995. "Augmented Reality: A Class of Displays on the Reality-Virtuality Continuum." Pp. 282–292 in *Telem manipulator and telepresence technologies*. Vol. 2351. International Society for Optics and Photonics.
- [34]. Musto, Joseph C. 1995. "High-Tech Future: A Scenario for Higher Education."
- [35]. OECD. n.d. "Overview of Methodologies." Retrieved May 22, 2020 (<https://www.oecd.org/site/schoolingfortomorrowknowledgebase/futuresthinking/overviewofmethodologies.htm>).
- [36]. Peckham, Eric. 2020. "Making Money from Games the Future of Virtual Economies." Retrieved May 29, 2020 (<https://techcrunch.com/2020/03/01/virtual-world-economies-will-unlock-a-whole-new-world-of-business-opportunities/>).
- [37]. Perez, Sarah. 2018. "Gwynnie Bee Is Bringing Subscription Clothing Rental to Traditional Retailers with Launch of 'CaaStle.'" Retrieved March 21, 2020 (<https://techcrunch.com/2018/03/22/gwynnie-bee-is-bringing-subscription-clothing-rental-to-traditional-retailers-with-launch-of-caastle/>).
- [38]. Seaver, Maggie. n.d. "Rent Designer Jewelry for Your Wedding Thanks to Start-Up Switch." Retrieved May 1, 2020 (<https://www.theknot.com/content/rent-jewelry-for-your-wedding-day-new-startup>).
- [39]. Shyam Sankar, S., and Manoj Changat. 2017. "Year 2025: Two Scenarios for the Indian IT Industry." *Journal of Futures Studies* 22(1):39–56.
- [40]. SmartSub. 2019. "Why Buy a Smartphone, When You Can Subscribe?" Retrieved (<https://smartsup.comasia.com>).
- [41]. Squar Milner. n.d. "SPOTTING THE DIFFERENCES BETWEEN TANGIBLE VS INTANGIBLE ASSETS." Retrieved (<https://squarmilner.com/tangible-vs-intangible/>).
- [42]. Stephens, Debra L. 2016. *Essentials of Consumer Behavior*. Taylor & Francis.
- [43]. Szmigiera, M. 2020. "Market Capitalization of Cryptocurrencies from 2013 to 2019." Retrieved May 25, 2020 (<https://www.statista.com/statistics/730876/cryptocurrency-maket-value/>).
- [44]. The Economist. 2017. "Undertakings of Great Advantage : The Market in Initial Coin Offerings Risks Becoming a Bubble." *The Economist*.
- [45]. Thematics Asset Management. 2019. "SUBSCRIPTION ECONOMY : THE FUTURE OF CONSUMPTION." Retrieved May 22, 2020 (<https://www.im.natixis.com/latam/resources/thematics-subscription-economy-whitepaper>).
- [46]. Turban, Efraim, Jon Outland, David King, Jae Kyu Lee, Ting-Peng Liang, and Deborah C. Turban. 2017. *Electronic Commerce 2018: A Managerial and Social Networks Perspective*. Springer.
- [47]. Underwood, Sarah. 2016. *Blockchain beyond Bitcoin*. ACM New York, NY, USA.
- [48]. Wahl, Mike Franz. 2013. "Ownership Typology: Four Basic Human Values & Will Based Ideal Types." *Research in Economics and Business: Central and Eastern Europe* 4(2).
- [49]. Wilhelm, ALEX. 2017. "WTF Is an ICO?" Retrieved April 21, 2020 (<https://techcrunch.com/2017/05/23/wtf-is-an-ico/>).
- [50]. Wood, Kyle, and Taylor Lindman. 2018. "Why the next CryptoKitties Mania Won't Be about Collectables." Retrieved April 27, 2020 (<https://techcrunch.com/2018/08/21/why-the-next-cryptokitties-mania-wont-be-about-collectables/>).