

## Ecosystem Positioning: AI Considerations and Geo-Political Reflection

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### Abstract:

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Ecosystem positioning entails storytelling for a package of things and not just about a single product. The uncertainty about competing environments is not purely driven by emerging technologies. Positioning amidst uncertainties entails gaining customer loyalty and setting a future direction for the business. Translytical-data permits machine learning of all kinds that recommends AI users as well as recruitment of early adopters. The use of data and AI is recognized as an important tool based on algorithms, utilizing digital dialogues generated from one-on-one inquiries as well as from various social media conversations. If AI can serve to inform individuals, it could serve to inform business positioning as well. The complete dominance of a particular ecosystem is only an ideal, even though all businesses aim for that as the holy grail. The AI marketing of today provides direct linkages of a particular vender to a particular end user. It highlighted the essence of a two-sided market driven by AI. The ecosystem of chips is important, though not necessarily the required winning edge. Geopolitics often plays a role in ecosystem positioning, but a case study of driverless cars in this paper suggests that positioning can go beyond technical capabilities, which is ever changing. Lifestyles matter. With that, ecosystem positioning goes beyond geopolitics.

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**Keywords:** Ecosystem Competition, Targeted Marketing, Digital Dialogues

### 1. Introduction

The 4<sup>th</sup> Industrial Revolution, characterized by an explosion in digital technology using the internet, is affecting the organization and re-organization of businesses around the world in many important ways. There are two main components in driving business and industrial decisions in these endeavors. The first is the use of API (Application Programming Interface). The ability of humans to ask questions and get answers is transactional but at the root is the exchanging of information. It being used on various digital platforms provides the basis of an API economy. Real world counterpart of exchange of physical products, hitherto existed prior to the 4<sup>th</sup> industrial revolution, are the results of digital dialogue; and although absent for certain type of API interactions, the belief is that information exchanges need to precede all physical exchanges. Thus, API greatly reduces transaction costs.

Digital dialogue can be one-on-one, like two people talking in a room, a question and an answer. The simplest form of this is a search inquiry. When there are many people talking simultaneously in a room, obviously, it will be noisier, but nevertheless still digital dialogues. The room can get big, as big as a football stadium or a casino, and extend into the future, digital dialogues in metaverse. The basic building block of digital dialogue is in one form or another evolution from API.

The second is the need for data. It is useless to design a platform where there are no visitors to utilize it or cluster to interact on it. The interactions, while useful as a precondition for exchange, whether it is BtoC, CtoC, BtoB, or a mix of the three, also allow the operator of the platform to gather data. There can be good data and bad data. Good data gives good recommendations. Bad data can be garbage in, garbage out. Although we live in an age of big data, it is not a sure thing that a recommended solution is the best solution. The joke has been that someone asked ChatGPT about his wife, getting back a recommendation that he should divorce her. Certainly, a big data world might not be the happiest world. It's up to humans to find their space in such a world.

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In other words, how businesses should position themselves in this rapidly changing technological environment, in a race for survival as well as for excellence, requires a thinking framework that can raise awareness for planning and positioning.

In this paper, we examine ecosystem positioning, with special attention paid to the consequence of data feeding as “oil” for AI engines in driving the 4<sup>th</sup> Industrial Revolution. Certainly, much of data on the web is public information in the sense that one company using (or browsing through websites) the information does not inhibit the use by others of the data. Yet, privacy considerations often impose additional constraints in using them, and the gathering as well as how exclusivity in the use of data can become major considerations in certain parts of the world. Also, national security often plays a role in affecting whether data gathering should or should not be made. These constraints can lead to geo-political factors in ecosystem positioning that are surfacing as a counter force for globalization.

Yet, geo-political considerations aside, fundamentally, ecosystem positioning must rely on good storytelling to form its core message. The main conclusion of the paper is that data-sensitivity as well as good/bad data collection will fragment the world into various ecosystems as a matter of cultural-specific lifestyles/work habit evolution associated with them. As AI technology does not have a world recognized standard body such as International Telecommunications Unit (ITU), it is likely that ecosystem positioning will result in heterogeneity and not homogeneity as one might expect under globalization.

### 1.1 Selling Story versus Selling Products

The crux of industrial organization for the 4<sup>th</sup> Industrial Revolution is not just about inventions and new markets (products) alone, but a variety of ecosystems to achieve scale and scope economies (Lorne and Razzaque, 2023). From laptop computers to the world wide web of www, and from internet access for passive information to e-commerce, we are entering a world of internet-of-things and a digital lifestyle dominated by the widespread use of cell phones and various digital devices. The ecosystems usually consist of a hardware component and a software component that is embedded on the hardware. The hardware often can be bundled, while the software is substitutable by successive revisions as well as other algorithms, giving rise to multi-product ecosystem based on optimum distribution perceived by players engaging in a game of push-and-pull (Lorne, 2016). Contractual nature of firm must be jointly considered with an epistemic nature of firm, (Lorne and Zubashev, 2020). Furthermore, business competition can be classified into three main types as Type I, II, III, entailing different characterization of a shifting of demand and supply, all aiming for maximization of welfare rather than just profit maximization. (Lorne and Razzaque, 2023). Type I focuses on improving supply and demand conditions for regional or niche emphasis, scale is not the focus although it may evolve to become scalable. Type II focuses on scale and scope for competition on price. Type III utilizes data exchange on the demand and supply side of the ecosystem, offering also bilateral exchanges directly between the demander and the supplier for its growth of alliances, and the expansion of the ecosystem.

Recognizing which type is the appropriate characterization of an existing business can be the first step useful for positioning. Regardless of which type a business wishes to identify itself with, it can no longer be strategically wise to emphasize a particular product characteristic as the essence of a promotion. Businesses today run the “business of aggregation”. As Lorne and Razzaque (2023) observed:

“Companies of today are working cooperatively and competitively in defining their ecosystem containing features in industries that are ever-changing. These ecosystems generally consist of a web of suppliers and customers in various “traditional” market segments, dissecting them in many ways. For example, the new reality of a “traditional market” for hotel lodging gets torn into various ecosystems of lifestyle accommodation, e.g., Airbnb, lodge vacations, motels, resorts, all-suites, extended stays, and boutiques that emphasize themes of various kinds. A market for cars or even the broad field of transportation is now evolving to become Transportation as a Service (TaaS), a term that would be “unclassified” in traditional industrial organization studies. A company such as booking.com has no single market easily identifiable that the company is competing in. Markets are now cross webs.” (See *Introduction* of the article)

At the start of 2024, a Neuberger Berman analyst commented on the weak Apple stock performance, characterizing ecosystem positioning as “playing offensive in terms of product innovation, and defense in terms of navigating the environment”. We cannot totally agree with that definition. The environment that we are living in now is very uncertain. The data evolving from this uncertainty may have to be understood, and repeatedly being understood, using AI, particularly given the fact that AI use of data entails many “parameters”.

Even at the very early stage of AI, OpenAI, Dall-E 2 has 3.5 billion parameters. In Google Imagen, it had 4.6 billion parameters. GPT-3 had 175 billion parameters. Current AI paradigms have over trillion parameters (*Asianometry*, 2022). The uncertainty of today's environment is embedded in data. Data inform storytelling (which can be good or bad); but via the tools of AI, data can assume a dual role: It can be the content and context of an ecosystem wishes to position (Eckert, 2022).

An example of bad storytelling can be found in Apple's promotion of Pro Vision, its latest virtual reality headset. Product features of the new device could be irrelevant except to satisfy technology aficionado's idiosyncrasies. If the story associated with a new product does not tell a good story, which in this case was a story of loneliness and isolation, it will only satisfy a small niche first generation user. If the marketing game must completely rely upon the first adopters' demonstrative effects in "crossing the chasm" (Moore, 1991), we do not see Pro Vision story telling had been successful in this respect. Certainly, its price tag of 3500 USD versus Meta's 400USD might have something to do with that too. In any case, we see platforms such as Tik Tok encouraging suppliers wanting to advertise on their platform to pay attention to the storytelling aspect of their business, although nothing can be assured whether a good or a bad story will be told.

Clearly, positioning is not just a matter of marketing, establishing good customer relationships also is the key to building a base that can induce vertical cooperation as well as expanding and identifying the character of a growing ecosystem. Walgreen, as a competitor in Type I business, allegedly has 7 to 8 million customers regularly visiting their physical stores every day. For businesses that rely on long term relationships usually requiring explicit contracts, it is a common practice to disclose a list of loyal customers as ways to suggest similar achievable results for new customers. Big platforms such as Amazon conduct annual conferences with their stakeholders to improve cohesiveness and corporate culture while also enhancing the growth of new membership. For all three types characterizing modern industrial organizations, we see platforms seeking various regional significance because it finds building a concentrated customer base to be important.

Nourishing existing loyalty and recruiting for new memberships aside, ecosystem positioning is partnering and bundling with strategic partners. That is crucial often rests upon the bundling of products and services, resulting in shifts in demand or supply for all three types of ecosystem competition. That is the essence of the business of aggregation, as such, participation in theme conferences for seeking opportunities for the growth of an ecosystem, however small, is exceedingly important. Indeed, the theory of firm in 4<sup>th</sup> Industrial Revolution is the *new* story of the firm (Lorne and Zabushev, 2020).

## 1.2 Artificial Intelligence epitomizes digital transformation.

There are examples of Type I (e.g. Uber), Type II (e.g. Costco), and Type III (e.g. Microsoft) businesses in every part of the world. AI technology affects all three types not only in the West, but equally in the East. In early study, we concentrated on examples originating in N. America. Uber, Costco, and Microsoft, all embrace AI in ways suitable for their businesses. In China, DoorDash type of business is rampant, with motorbike deliveries causing hazards for pedestrian traffic. China is also quite innovative in this respect, medicine delivery service, ddky.com, is an alliance of 600 medical brands, promising door-to-door delivery of medicines within 28 minutes of placing order. Internet shopping, the equivalence of large indoor malls clustering (Porter, 1998) as in N. America-Type II leisure hangouts, arguing has become more important for consumers in the East. Giants like Tencent, Alibaba owning social media platforms, electronic payment apps, streaming services, etc. are not unlike those of their counterparts in the West.

For all three types of businesses in the *new* industrial organization, AI methodology can be applied in a variety of ways from a technical perspective in the way that information is processed, programmed, and used. Information comes from data, without which, the AI engine cannot strive. For both East and West, their culture-specific lifestyle could be the deciding factor (*Databricks*, 2023).

Thus, AI methodology entails different ways information is being used. A popular assumption for AI technology is that data is data. It's dead formulae of digital symbols of zeros and one. Human behaviors are treated as data observations, though it must be modelled before algorithms can be applied. The model, based on assumptions, strives to target for giving recommendation, i.e. inform how results can be used. This can be done repeatedly via machine learning, training recommender algorithm and filtering and adjustments in refining results.

Data is important for AI via federated learning also. That is, by the sharing of the data provided by a group of vendors, there can be an information pool that the members of the alliance can use the centralized data for machine learning for insights on user behavior and its various characteristics.

Whether data comes from single platform or multiple platforms, the recommender system (methods) of AI can be 1. Content based, 2. Statistic based, 3. Collaborative filtering and 4. Hybrid of the three methods. For marketing, big data can feed a recommender system for digital transformation sometimes in shocking ways: for example, customer profiling can use shopping behavior to predict what type of things a customer would like to buy even before shoppers are consciously aware of what they want to buy, e.g. Large retail shops allegedly used AI to detect pregnant women preference of purchase, even though the pregnant woman does not want or even know that she is pregnant. But based on the type of things they bought, AI could infer they might be a pregnant consumer, thus suggesting what they might want to buy.

Of course, designing a recommender system is a mathematical exercise. There are many companies that are doing AI just for the purpose of doing AI as a program or algorithm challenge. The motivation of these endeavors is not at all different from the original invention of block chain, a pure mathematical exercise, with expectation that a particular algorithm will eventually find its use in the future. Yet, technical formulation is always just one element of a complex ecosystem evolution equation, the broad formulation of which may still be unknown; but as people say: Rome was not built in one day. What is fascinating about AI is that there is yet an international standard of building AI, thus it is entirely possible that there can be different *Rome* built, perhaps some in the East, and some in the West.

Undoubtedly, ecosystem positioning depends also on funding, *CB Insights Newsletter, Dec. 21, 2023*. Up and down cycles are expected, but clearly, AI investment seems here to stay, judging by the phenomenal stock market run-ups of semiconductor companies such as Nvidia (226%), Besi (139%), Navitas (132%), the top three in 2023, as well as many others considered to be “AI-play” (Tyson, 2024). We do not believe AI technology was the only driving force in this run up, as ecosystem positioning will not depend on technology alone.

An important consideration for AI technology is the question of the relative importance between hardware (device) and software. As mentioned in earlier section, the internet-of-things is a marriage between the two. For hardware, the design and the type of chips used can be of crucial importance. The chip manufacturing process consists of designs and fabrication (manufacturing). It requires Electronic Design automation (EDA), with notable companies such as Siemens, Cadence, Synopsys. offering needed tools for design. What we often hear are well known foundries (manufacturers) such as TSMC, Intel, UMC, etc. (Sun, 2023), but without good designs, there will not be good chips. Foundries manufacture chips for physical devices. Devices are what final users buy, which normally require additional software and apps to make the devices work effectively. Chip types can be of a large variety of CPU, GPU, DOR, etc. Software and apps come from companies such as Apple, Microsoft, Sony, Samsung, as well as various “fabless” chip companies such as Qualcomm, Nvidia, Amazon and Facebook (Blank, 2020).

There are reasons to believe that chip manufacturing is crucial also to the development of AI. Well- designed chips can support efficient on-device processing, allowing speedy calculation of complex algorithms, and reducing reliance on cloud-based solutions. Here, the design principle of chips is governed by PPA, short for Power, Performance, and Area (e.g. one feature is in nanometer (nm)). The design process involves on average 2 years, while manufacturing usually takes 6 months. Certainly, the design process has technology opportunity costs also, in that designs can become obsolete quickly due to competition, and therefore, a scale production of chips sometimes making a better business sense than having new designs as the primary goal for competition. Undoubtedly, AI considerations will make chip design increasingly important, as we are hearing that some cell phones are already AI enabled (*Techquickie*, 2016).

Chip design will depend on what device it will be embedded in, and the purpose of the device, i.e. what is it being used for. For example, a device aiming for power conservation, having AI to turn on and off power depending on traffic, is likely to focus on the first P. Portable devices, like cell phones, are likely to aim for Area. Devices requiring complex calculations may focus on the second P, Performance. Thus, the PPA triangle is not likely to be symmetrical in all circumstances. It will be lengthy research beyond the scope of this paper to examine the relationship between designers and foundries, but some examples can be revealing to conclude the discussion in this section.

Undoubtedly, for year 2023, Nvidia has received most attentions. The company derives its revenue from manufacturing and supplying specialized chips to major corporations such as Microsoft, Amazon, TikTok, and Dell. The design and purpose of the GPU align with the intended use of a device.

Nvidia's GPUs are renowned for their excellent compatibility and a diverse product range, contributing to a substantial market share in both Eastern and Western markets. These processors offer good applications, ranging from personal use to large corporations, where they enhance device speed. Nvidia's processors are recognized for their reliability in various tasks, including data visualization, big data analysis, and machine learning. Many corporations leverage Nvidia processors where high-performance computing is essential. Processing power of Nvidia devices is particularly advantageous in tasks where complex calculation and large datasets are involved. The significance of the company extends to the development of AI applications, where their services are in high demand, establishing Nvidia as a key player in ecosystem positioning (Heller, 2022; Morrison, 2023), with innovations for chips continuously evolving (Tan, Ludlow, Ghaffary, 2023) as well as new funding.

### 1.3 How electrifying data of Type III can affect the Character of an emerging ecosystem

Our inquiry of ecosystem positioning can also be conducted from the angle of the three types of business competition mentioned in section I, which define marketing for ecosystem as “storytelling”. While AI can affect all three types of business competition, Type III business entails a scale effect combined with two-sided markets (Rochet, Tirole, 2003) in a way that would draw out the unique contribution of data for AI implementation. First, we need to know that for an API economy, digital dialogue is absolutely essential. The bandwagon effect unique to Type 1.3 builds on social media conversations of user experience, as well as the bundling of suppliers to supply products and services on an ecosystem of *platform*. Training data on both demand side and supply side via AI can build loyalty.

Digital dialogue can be in the form of social media, via cooperative and/or debates of political thoughts, theme topics, sharing of user experiences, etc. API type of dialogue is in the form of a search. It's more a one-on-one interaction. It can be leisure driven, or productivity driven. The 4<sup>th</sup> Industrial Revolution also promises the prospect of visual meetings, with the game industry alone taking a gigantic \$86 billion business share in 2023. Certainly, e-sports, meta experiences of numerous kinds, all have endless possibilities. The only difference is that social media is conducting digital dialogues in a bigger and noisier room.

A unique phenomenon we are now seeing is that different platforms are building their platforms via alliances with marketers, who are the middlemen between vendors (suppliers) and the final users (demanders). These endeavors all aim for the holy grail of achieving Type III, although not all of them would be successful in doing so. The dilemma is that most also do not foresee the pitfall if indeed they ever become successful; as once Type III was found to be realized, a business is likely to be regulated by Antitrust scrutiny. Thus, it cannot be said that once Type 1.3 is achieved, a business has reached a green pasture forever thereafter, although it would be difficult to conceive that companies such as Walmart, in spite of its investment in adopting AI in its many fulfillment centers, will reach a Type 1.3 kind of business.

A little elaboration on how AI has affected a “two-sided market” of Type 1.3: In a two-sided market, personalization using AI is playing a significant role. For example, in e-commerce platforms, an AI-driven recommendation system is increasing business for sellers while at the same time enabling buying easier for targeting customers with Call-To-Action recommendations. Sellers are experiencing more profit with less effort through the accuracy of an audience match. On the other hand, buyers are having a good shopping experience with minimal time investment with AI-driven search technology.

Extending this line of thinking, advertising is becoming more effective due to precise targeting. Users' data is available to be exploited. AI-based solutions work behind the scenes to sort the audience demographic, interest, and behavior as much as possible. On any digital platform, advertisers are now leveraging AI-driven advertising panels to target the right audience. To be sure, Google has been providing Google AdWords and Google Analytics for advertisers to find potential customers for their products or services for a long time already. Meta is providing Meta Ads Manager to advertise on platforms like Facebook, Instagram, and audience network with effective targeting likewise for equally long time also. The AI revolutions are re-enforcing this type of focus.

Another example of a two-sided market can be found in the job marketplace. Job markets are now highly dependent on AI-driven solutions, with seekers applying through various job portals. Employers are sorting resumes using the Applicant Tracking System (ATS). This connection is making an efficient connection between employers and job applicants, where AI is playing a big role in the middle. This results in saving time in the hiring process.

Generally speaking, the field of marketing has been greatly assisted by AI(Davenport et.al. 2021; Gartner and Schurz,2023). Marketers all strive to help their clients to find the “right” targeted audience, in an environment with all firms trying to achieve Type 1.3 dominance.

The use of data to allow the direct transaction between a demander and a supplier is ubiquitous. Below are some examples of platforms. Some built it based on the lowering of transaction costs (digital dialogues) only. Some built it based on social media, either on the demand side or the supply side, creating a brand-wagon effect.

Table 1: Examples Of Potential Type 1.3 Platforms.

Platforms	AI tools used for data collection via social media/digital dialogues
X, Previously Twitter	GROK: Conversational AI tools providing real time information ( <i>Grok</i> , Undated).
Snapchat	MY AI: Helping with the trivia questions of users (Heath, 2023).
Microsoft	LINKEDIN with COPILOT: Utilizing LinkedIn data as well as search information via keyboard activation, recommendations from Copilot can be made ( <i>Copilot AI</i> , Undated).
Google	GEMINI: Connect all google platforms to solve users’ queries ( <i>GoogleDeepmind</i> , 2023).
Amazon	BEDROCK: Most updated AI paradigm of Amazon (Diaz, 2023).

In the domain of type III competitions, AI is playing a significant role via content generation specifically in advertising for marketers. AI is also shaping strategies and optimizing digital media interactions for the users.

Through machine learning algorithms, AI is simplifying users’ information and provides organized platforms to run advertisements for the marketers. Investment in marketing now depends on how friendly the ad platform is based on precise targeting and better return on investment.

In conclusion, digital platforms are trying to gather data of the users and process that information to empower the marketers for precise target and lead generation. Ignoring this fails to understand the potential power and the danger of AI in ecosystem positioning.

**1.4 Geo-political Reflection: the case of Huawei vs. Tesla**

When Donald Trump was the president in USA, highly restrictive regulations were imposed on technologies from Huawei of China being used in USA (Geib & Pfaff, 2022).It became the most known casualty of the chip war between USA and China.A study about this company is thus particularly interesting for its ecosystem positioning considering geo-political adversity (Lim, 2024).

One primary repositioning Huawei had taken was a spinoff of its lower brand product line, Honor, into new ownership(Bhati, 2024).That change in ownership allowed the new company to by-pass some regulation. Now Honor cell phones have Google app installations thereby expanding its use capabilities in countries outside China. Honor prides itself on efficient production line and continuous improvement most likely according to, at least not in conflict with, the security requirements of USA. Honor called its production line “Honor Intelligent Equipment Platform”.

Independent of Honor, Huawei also made strategic moves into the driverless car business by implementing 5G into electric vehicles named AITO, short for “Adding Intelligence into automobiles”. This move is as shocking as if Apple wanting to have an Apple car. It’s operating system, Harmony OS, promises screen sharing of APPs on cell phones and laptops on large display screen inside the car; thus,in principle, enabling a car being used as a working mobile office. Huawei collaborated with Seres and launched their first luxury EV AITO M5 promising a range of 1242 kms in a single charge. The in-car version of Harmony OS is same as it is in the Huawei phones. That makes it one of the most interesting features as the car once connected with phone gets converted into mobile office. All the phone applications can be used from the car screen; this unique feature of integration of car system and phone is what the company promoting. Harmony also has strong in-car voice recognition assistant “Xiaoyi” that can control all the features in the vehicle. Huawei implemented Harmony OS with various auto manufacturers developing dashboard-based smart tool where all the Huawei devices can be synced in one system and hence, a passenger can send a text message from car screen with just voice command. Perhaps reflecting a Huawei aficionado sentiment in China, the company received 6500 pre-orders in four days for the EV powered by Harmony OS.

To be sure, Huawei is not the only player in driverless car business in China. The work/lifestyle focus has other EVs in China also embracing the same (*Li Auto*, 2023). A mobile work/live lifestyle may or may not happen in China. These cars are storytelling a lifestyle for the future, but unsure how popular it may become. Li Auto2 and others all in different degree move in this direction of promotion. Thus, it is by no means certain that Huawei will acquire her dominance in the driverless electric vehicle business in China, not to mention in the world.

Huawei's strategic move into the driverless car business could be a response to geo-politics, as it could be making a breakthrough in cultivating a niche in the field of TaaS, Transport as a Service, which is a growing and expanding field of ecosystems that may redefine what lifestyle means in the 4th Industrial Revolution, at least a kind that may happen in China though not necessarily having this work/lifestyle form being accepted in other parts of the world.

Irrespective of how the technology unfold, the ecosystem positioning of Huawei serves to illustrate the main points in previous sections of this paper:

- (a) Storytelling projects a future lifestyle that Huawei wishes to promote.
- (b) The ecosystem emerging requires recruitment of early adopters who can also provide data for improving vehicle performance via AI.
- (c) Partnering with various manufacturers and vendors for co-promotions could expand and more effectively brand the ecosystem.

In the context of the new industrial organization mentioned as the framework of analysis of this paper. Huawei most likely is still engaging in a Type I business while electric car leaders in the world such as Tesla and BYD are striving to compete in Type II business, i.e. price competition via scale economies. Ecosystem competition of driverless cars in China seem quite different from that in the West.

The West has one big player in driverless vehicles, Tesla, which has its own path of ecosystem positioning. The company is relentless in working on exploring the Full Self Driving using Big Data Analytics and Artificial Intelligence (AI) (Yada, 2023). Tesla is collecting on road data using sensors and cameras on their vehicles; that data is then analyzed and utilized in identifying dangerous hazards on the road like other vehicles, persons, and objects. (Chen & Mao, 2022). This real time data collected through ultrasonic sensors like Camera, GPS, Radar, and Lidar is then trained and analyzed using machine learning (ML) which will learn and adapt with the data collection, and reacts based on historical and real time occurrences. It also enhances user experience by learning driver's habits and preferences and personalizes car's settings and features. Henceforth, the use of ML, big data and AI, Tesla cars aim for an astute vehicle that can be driven in any driving condition.

Dojo is Tesla's own customized supercomputer developed from scratch for training and machine learning the data gathered from its EVs. Dojo has Tesla inbuilt chips and the whole infrastructure is designed by the company itself. This will improve the capability of Tesla to train its neural network using the data collected from sensors of the car which is of paramount importance for vision tech and self-driving. Unlike Nvidia's GPU based supercomputer by Tesla, Dojo replaces six GPU boxes with a single tile making it small and still less costly than GPUs. Tesla has its own powering and cooling system for Dojo Exapod (Combined cabinet of system trays) as they once blew their local power grid for testing the Dojo cabinet.

The uncertainties in the driverless car business are huge. The sophistication of an operating system may be decided by how the cars will be used in their respective environment. The work/life balance that the consuming population in a country chooses. This can be justified by the fact that Tesla is training its cars using machine learning in an environment very different from that in China. The latter is having haphazard pedestrians and two wheelers cutting the cars randomly. This environment is also prevalent in other Asian countries. But data generated from those environments are great data, good data, that can truly make an automobile autonomous, which at this point is just an ideal, with push-back from public such as those experienced in San Francisco, USA.

Below table highlights certain technical features and the marketing of Huawei vs. Tesla:

Table 2: Comparison between Tesla and Huawei Aito, Information Based on the Two Companies' Website.

Ecosystem	Tesla	Huawei
Operating System	Dojo – Supercomputer concept	Harmony OS
Chip	D1	1C300B
Software	PyTorch (Linux group)	Unix like (Modified AOSP)
Memory storage	SRAM [static random-access memory] storage	RAM storage
Design	Tile packed in 5X5 array (25 D1 chips in a package)	4 layers (Kernel, system service, framework, and application)
Usage	Specifically, to train Tesla car using Machine Learning	Smartphones, Tablets, TVs, and Smart watches
Model/Price	Tesla X: CA\$109,990.00 (2023)	AITO Electric Max: CA\$109,248.21 (2023)
Range in Kms	578	630
Types of Models	Model S, Model X, Model Y, Roadster	Wenjie M5, Wenjie M7 and Wenjie M9
Driverless option	Full Self Driving (FSD) -12,000 USD annually	Fully Autonomous (Included in car price)
Marketing approach	No Unique storytelling about features	Emphasizes mobile lifestyle

Tesla focus is unlikely going to be in China, and their testing ground is also likely to be different. All the AI data collected by Tesla is either good or bad depending upon how useful it. The data is used to train the AI model which helps in enhancing driver experience. Highway data is not as useful as city data if traffic is not significantly heavy on highways. More the complexity of data, more are the chances that data is good. Bad data is that which does not help in improving the driverless features of Tesla. However, equal storage space is used up by good and bad data, So the point of research is to how to eliminate bad data so that storage space is not wasted, and eventually more energy and cost is being saved. In the US, driverless taxi company Waymo appeared to be on the road for a while; but apparently experiencing set back in San Francisco.

Competition of driverless cars ultimately must depend on early adopters' lifestyle in the two countries marketed by good storytelling. On the technical side of things, we note that running a driverless car must entail having a system governing 100-300 chips all within one single car. While many of the chips are present also in fossil fuel cars, there are chips specific to the operation of driverless features. SOC (System-On-Chip) seems to be the focus of the chip industry now. As *Asianometry* video tutorial cited earlier on *Compute-in-Memory* has shown, there are two main components in SOC—the Processing (CPU) and the Memory (DRAM). SOC emphasizes the combination of Processing and Memory on a chip.

Indeed, when it comes to a driverless car, even embedding memory on a particular chip will not be sufficient, because it requires coordination of chips, as there are many functions in a car operating at the same time. That coordination involves an operating system of SOC chips and other chips such as various type of sensors, some are run even analog, but the coordination will convert and integrate, with all being integrated into digital formats. The driverless car manufacturers have to provide a blueprint (design), i.e. mask, for making the chips. Competition in chip making can be crucial, but it will not be the only deciding factor in determining who is the winner. At the point of this essay, Nvidia has already its own driverless kit, Orin (*Nvidia Developer, 2023*).

Looking ahead, Tesla could be doing its own ecosystem positioning by bundling its newly acquired social media platform twitter, now rebranded as “X”, whereas Huawei does not seem to have an equivalent social media to bundle, although announcing in 2024 that they will launch a competing virtual reality headset to compete with Apple's Vision Pro. Huawei aficionados may want to have their own social media. All these will depend on how the two companies want to ecosystem position itself, which must rely on data informing the companies how their early adopters are using their cars, where and how.

## 2. Conclusion And Remarks

In this age when businesses around the world are beefing up their internal expertise to understand platforms and positioning, this paper strives to provide several thinking points for contemplation. While technological improvements themselves are important, they should not be the only element of consideration. Ecosystem positioning depends very much on the cultural needs of the society that the ecosystem can be built to serve.



Seeking early adopters and bundling of hardware and software, picking the right storytelling for the direction of the ecosystem a business wishes to pursue all matter. AI software and chip innovations, e.g. ChatGPT in the West undoubtedly will shape the landscape of industrial organization in that part of the world, but its rival, Baidu's Earnie bot, is also gathering over 100 million users at the end of 2023. Although hardware and software are equally important for AI development, when the role of AI chips is together contemplated with software applications, it can be illuminating to know that regulations of chip-exports due to geo-politics and de-risking can affect outcomes, but the outcomes can also be affected by the evolving lifestyle changes in different regions of the world. The later factor depends on marketing. AI development of all kinds is going on in the East as well as in the West. Huawei's and Tesla's ventures on driverless vehicles may each take their own routes, depending on the country's early adopters' lifestyles. Therefore, the type of marketing efforts each company wants to tell stories in their own respective ways, utilizing the digital dialogues on various platforms, could be an important element beyond achieving technology excellence. Indeed, technology as well as lifestyle changes can go hand in hand, evolving differently in digital dialogues in East and West, rather than attaining a globalization optimum of seeking "the best".

The 4<sup>th</sup> industrial revolution characterized by digital transformation with lifestyle changes can be generalized from the case study of driverless vehicles, the outcome of which is still unknowable. The persistence of the value of bitcoins, irrespective of its intrinsic value (or at best a collateral value), is purely found upon its proficiency for being exchangeable into other cryptocurrencies. Each "other" cryptocurrency is developing its own technical uniqueness, but the expansion of an ecosystem requires the users to communicate on its platform in digital dialogues. Crypto platforms that understand the equal importance of technical capabilities and can choose a theme to communicate will sustain and win. Others will fail. Bitcoin serves as a gateway, and a common currency, to this conglomerate of ecosystems of the future.

Ecosystem positioning has a broad scope of relevance for big business as well as small business, most cryptocurrency-based ecosystems are small, but they all share some positioning similarities. Via various types of consumption and production applications, all requiring supporters of end users, the ecosystem of loyal fans to support their growth. These lifestyle-fans, particularly for games, grow by good storytelling. We believe this factor can overwhelm the pure technical considerations of chips and software, which are the current focused winning edge in public eyes. Ecosystem positioning is thus borderless, going beyond geo-politics while at the same time subject to unknown regulation affecting their consumption and production niches. AI embedment is the tool that businesses of the future are trying to position their respective unique ecosystems.

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