

THE UN CHARTED

**Invent New Industries,
Set New Standards**

Businesses are not just creating new products and services; they're shaping new digital industries.

From technology standards, to ethical norms, to government mandates, in an ecosystem-driven digital economy, one thing is clear: a wide scope of rules still needs to be defined. To fulfill their digital ambitions, companies must take on a leadership role to help shape the new rules of the game. Those who take the lead will find a place at or near the center of their new ecosystem, while those who don't risk being left behind.

Whether they're blazing a path to automated driving or precision agriculture, the breakout businesses of today are defining the rules and standards for entirely new digital industries. Participating in the prevailing markets is not enough. In order to grow through their digital strategies and continue to be relevant, companies must work to shape the digital markets of tomorrow.

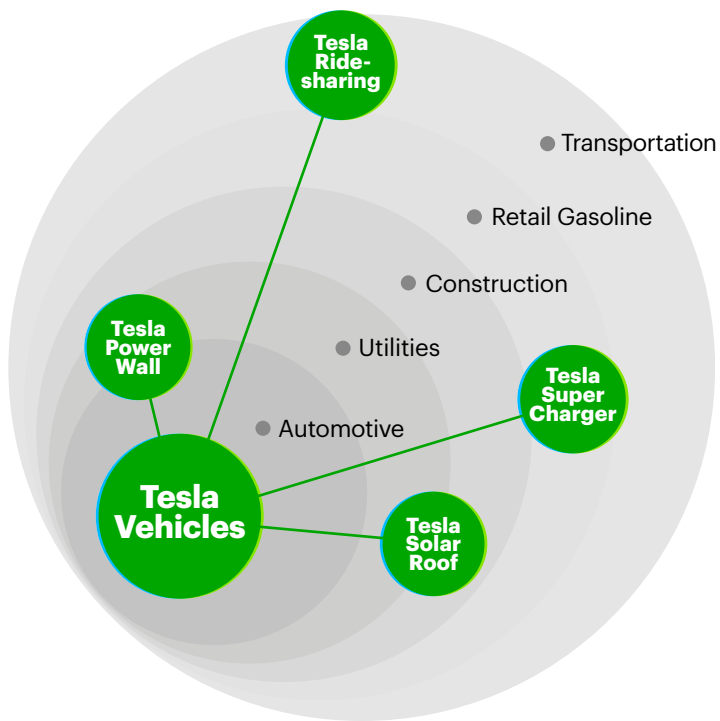
The early adopters have already started. Tesla's Silicon Valley approach to building electric vehicles has set them apart within the auto industry, but their plans portend a future as much more than a car company. Tesla's digital strategies cross multiple existing industries as they look to shape new ones.

The company is expanding their energy storage research into products for the home that upend traditional utility and building approaches, while their upcoming Tesla Network will create a fleet of personally owned Tesla vehicles to be used for self-driving ride-sharing – creating an entirely new model for both car ownership and shared transit.¹ Tesla's diverse digital strategy puts it in direct competition with legacy companies from myriad industries, while those legacy companies lack the maturity of a digital ecosystem to compete in more than one.

From every angle, it's apparent that emerging industries like this one are not just 'version 2.0' of industries that existed before. The change is much more dramatic: these new digital ecosystems are transcending disparate markets to create new digital industries.

These changes are happening at every level of business, in every sector. According to Gartner, "by 2020, your company will either lead a digital business industry you have created or be part of one created by someone else...if you are still in business."²

Amazon and Netflix started out, respectively, as e-commerce and DVD rental companies; they now both compete with television production studios and broadcasters through their streaming content, with Netflix getting their largest number of Emmy nominations ever in 2016 and winning a personal-best nine, and Amazon walking away with six.³ NVIDIA, which built their empire on computer video cards, developed graphics processing units (GPU) to address a host of problems fundamental to video, and have now adapted that technology for applications in supercomputing, the Internet of Things, and automotive. In fact, these are their biggest growth areas, not video.⁴



SETTING NEW STANDARDS

Taking the lead in this new environment creates new responsibilities. To thrive, companies must shift from market taker to market shaper.

Not only will successful organizations blaze a new trail in products and services, but they will also have to set the guideposts for it – from ethical standards, to industry best practices, and beyond.

Forward-looking companies are paving the way by defining the new rules of the game. Rather than sitting passively and waiting for guidance, Tesla is setting guideposts for both electric and driverless cars. Every car Tesla builds is 100% electric, and comes with the hardware necessary to make it autonomous; the company claims that enabling the feature simply requires regulations to be established and a company-issued software update.⁵ Tesla is both asking regulators to catch up to their advanced capabilities and actively working to shape the rules, collaborating with government regulators to create standards for the autonomous transportation industry. In June 2016, the US government announced a partnership with Tesla, other major auto manufacturers, and energy companies to create the *Guiding Principles to Promote Electric Vehicles and Charging Infrastructure*.⁶

By establishing best practices for their entire industry, businesses can help ensure that others must abide by those standards to compete in the new market. Strong standards also help to negate the need for external regulation. Alphabet, Amazon, Facebook, IBM, and Microsoft are working together to create a standard of ethics for advancements in the AI industry.⁷ Although these companies are competitors, they're working together on ground rules for the entire ecosystem of AI pioneers. Collectively setting the rules for this rapidly evolving industry helps to mitigate the risks of complex external oversight, prevent harm to consumers, accelerate innovation, and protect the reputations of every brand pushing the frontier of AI.

Winners will have to take on new corporate responsibilities to shape emerging digital industries. To be successful, businesses must work with regulators, standards bodies, and other ecosystem stakeholders to educate, collaborate, and define the rules of a new digital industry. They will also need to outline the new industry's ethics and best practices, and in some cases, heavily influence the social contract. Those who take the lead will find a place at or near the center of their new ecosystem, while followers will land on the periphery.

LEADING ON MULTIPLE FRONTS

Today, companies recognize that rules and guidelines for existing industries are outdated. 65% of IT and business executives we surveyed believe that government regulations in their industry have not been able to keep up with the pace of technology advancement.

To move forward with their digital strategies, businesses from all industries will need to take on additional roles to define the rules of the digital economy (see figure 1, page 72). From technology standards to industry best practices, government mandates, or ethical norms based on public opinion, in the ecosystem-driven economy, one thing is clear: the rules that are left to be defined span a very wide scope.

In some cases, there is simply no existing guidance that's relevant to the challenges of a new industry's products, services, or value chains. This is often the case with ethical guidelines, as new technologies present new types of considerations with ethical implications. In the case of virtual reality (VR), Google's Daydream VR team recognized how damaging foul play can be in online communities, and wanted to prevent abusive virtual behaviors from driving customers away from the technology.⁸ The company built features into their VR platform that not only recognize the sanctity of personal space, but also encourage positive interpersonal

interactions with bonus features such as animations and sound effects (e.g., fireworks and clapping sounds when players give each other high-fives). These features don't accompany aggressive actions, encouraging players to exhibit positive actions in order to earn rewards.

When businesses do have existing operating rules, they were likely written prior to the dawn of the digital era, and long before any of these new digital industries or technologies were created. As a result, they're consistently incomplete, often irrelevant, and can act as a limitation to progress when applied to new hybrid ecosystems.

The finance industry in Japan, where legacy regulations limit a bank's ownership in non-finance companies to 5–15%, is a case in point.⁹ Regulators in Japan consider

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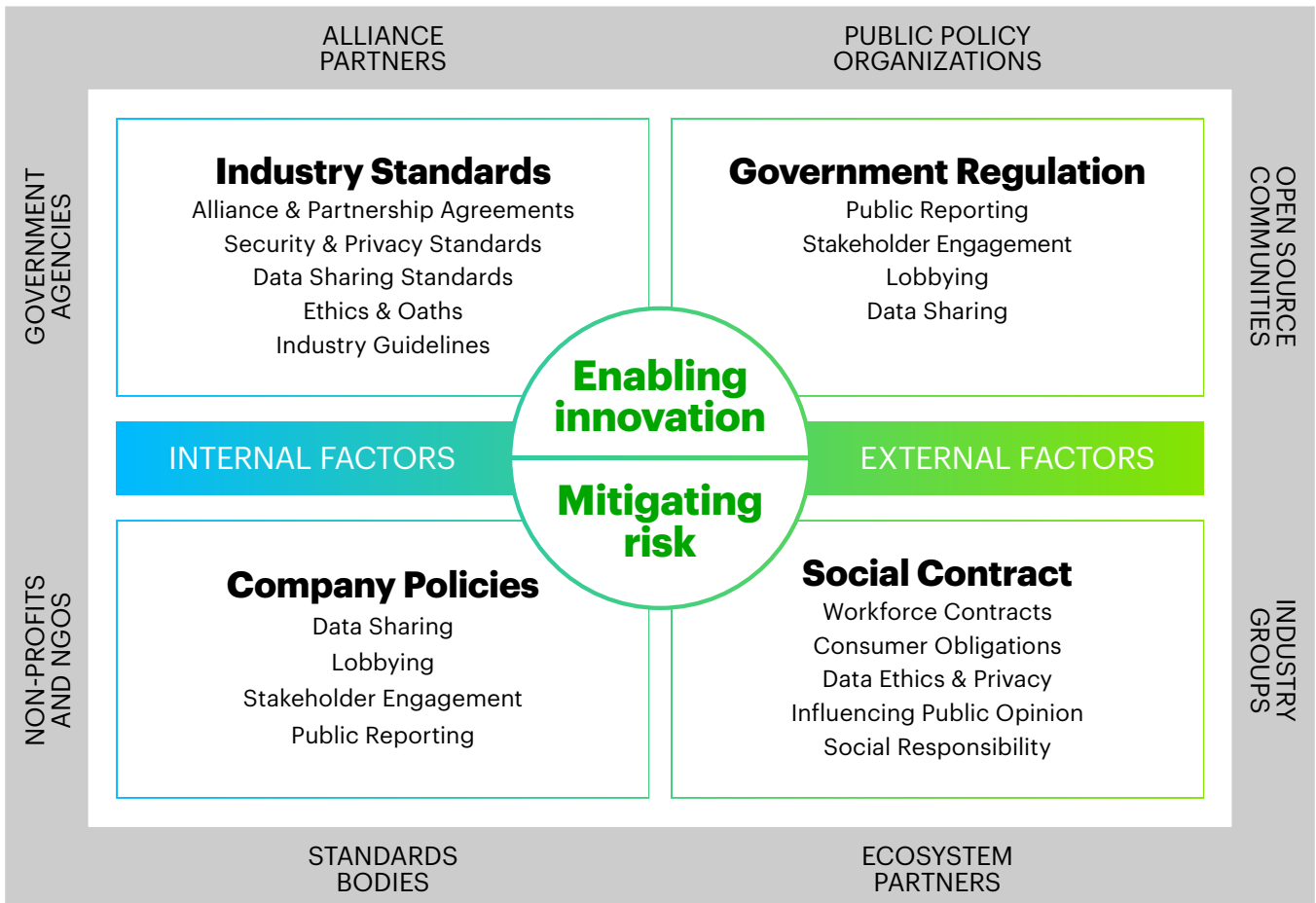
financial technology companies to be technology firms, not financial firms – so while megabank Mitsubishi UFJ might want to take a portfolio approach to investing in financial technology startups, regulations make that impossible to do strategically. In response, Mitsubishi UFJ is building an in-house financial technology R&D division to deliver the innovation they need.

In digital industries, competitors are joined by partners from completely different areas of business, meaning the rules for a new industry must be written to both consider and apply to every partner – no small feat given the varied capabilities and demands

of stakeholders in emerging industries. Mashups that would have been unheard of a decade ago are becoming more commonplace: who imagined that General Motors would invest in a car-sharing service, let alone acquire an AI company to work toward automated driving? Combinations like these will shape new digital industries, where new rules must be written to apply to organizations from multiple sectors of the economy.

Regardless of the circumstances that lead to the formation of a new industry, the partnerships within it will define the contours of what’s to come. As with GM, companies will need to collaborate with ecosystem stakeholders who

Figure 1: New ecosystem for digital industry pioneers



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do not share the same industrial heritage; they'll also need to work with industry organizations to set standards. For example, GSMA, the global industry group for cellular communications, has assembled 58 independent carriers and Google Android in an industry-wide effort to advance mobile messaging. This new approach will enable all phones across all networks to have compatible messaging experiences with group chat, high-resolution photo sharing, and more.¹⁰ Equally critical, leading companies will also need to work with consumer protection organizations, open source communities, and others to set guideposts for new digital industries.



REDEFINING RELATIONSHIPS

POLICY & PUBLIC

OPINION

Just as organizations will have to work with industry partners to set new rules, partnerships with governments and consumers will be critical to moving forward.

Governments have historically struggled to keep up with the pace of innovation. As a result, their policies often lag behind the industries they're required to regulate. Rather than waiting for government agencies to catch up, leaders of emerging industries will partner with these agencies, working together to ensure that any new regulations are inclusive of subject matter experts within the industry.

Where new digital industry efforts conflict with existing public policy from incumbent industries, companies must work with the relevant stakeholders to update or develop new rules. Airbnb has offered to self-regulate in San Francisco, Chicago, and New York.¹¹ By offering enforcement capacity to cities, the company looks to be more effective at shaping market dynamics (e.g., collecting and remitting taxes, requiring landlords to register with government agencies, preventing a single landlord from listing multiple properties) than what public policy alone could achieve. Partnerships like these will become increasingly common as companies push the boundaries of existing technologies, products, and services, creating new offerings that demand innovation in regulations as well as business models.

In some cases, public opinion itself will expedite the regulation. Early in Airbnb's lifespan, a host's home was ransacked by a guest. This was the first such incident and the company had no playbook for what to do next.¹² Today, Airbnb does have one, and they used this event

(and several others) to develop safety and compliance rules for hosts and guests. The company continues to update their rules as needs arise – for instance, after they uncovered systematic discrimination among hosts, Airbnb added anti-discrimination rules for hosts.¹³ Rather than wait to see where public opinion will land on a groundbreaking new industry, leaders will be proactive, working with stakeholders to determine where the lines should be drawn and how they'll be enforced. 78% of the executives we surveyed agree that their organization feels it has a duty to be proactive in writing the rules for emerging industries.

As businesses create these new relationships with governments and other stakeholders, they'll find it sets the stage to work on larger issues related to the new social contract being created as society evolves. Put another way: emerging industries can redefine what governments, enterprises, and individuals are responsible for in the digital era – and the potential disruption to the social contract is monumental. For example, the role of human labor and employment is now under constant redefinition. Uber has roughly 200,000 drivers globally, and a 2016 court decision in the UK held that these drivers must be considered employees; yet in other countries their relationship to the company remains as that of a contractor, but their role seems to sit somewhere between contractor and employee – leaving them in an undefined gray area.¹⁴ Clearly, the social contract is evolving; the question is how strong a role leading companies will take in influencing what it becomes.

USING A NEW ARSENAL OF TOOLS

The ripples created from a new digital industry can turn into disruption at all levels of society. This is why leaders must consider digital trust (security, privacy, and digital ethics) as core to any digital industry strategy.¹⁵ Doing so will drive adoption not only by consumers, but also other industry members and government regulators.

The scope and depth of defining rules and responsibilities change in new digital industries. Companies won't just be implementing governance strategies through offline activities like boards and committees; they'll be digitally replicating these approaches by embedding rules and standards within technologies themselves.

The most mature of these emerging technologies is the distributed database known as blockchain. Blockchains deliver built-in solutions to many historical challenges of governance: transparency, a guarantee that records have not been changed (immutable), and the ability to operate in a distributed fashion. Many banks are using private blockchains to speed intrabank transactions, cutting operations that previously took two to six days down to mere seconds.¹⁶ Maersk shipping lines has experimented with using a blockchain to replace cumbersome bills of lading, which often cost more to process than the price of a shipping container.¹⁷ IBM, Walmart, and Tsinghua University are using blockchain technology to "improve the way food is tracked, transported, and sold to customers across China."¹⁸

Another technology, known as differential privacy, integrates digital ethics and privacy standards. A statistical technique that adds predictable amounts of noise to data, differential privacy protects individual data subjects while preserving the accuracy of the insights derived from a large group of data subjects.¹⁹ It can help deliver the type of privacy controls required by strong governance, while also giving businesses a way to accept accountability for the privacy of their customers. Google's Better Cities initiative is using differential privacy with data gathered from Google Maps on mobile devices to gain insights on traffic conditions in Stockholm. The goal is to apply advanced analytic techniques to improve travel times without revealing any individual's trip.²⁰

As digital ecosystems expand, another technology innovation – smart contracts – offers an automated way to enforce contracts whether the counter-party is trusted or not. Smart contracts design-in the rules for an exchange of value and can be self-exercising or self-enforcing as a situation demands. One of the first public smart contract implementations allows people to buy gold – using Bitcoin or Ether cryptocurrencies – in any amount without the steep fees of traditional exchanges.²¹ Buyers receive a digital token that is redeemable for a unique bullion bar at a real-world, secure vault. The gold's provenance is traceable and immutable, indefinitely.²²

Participation in larger ecosystems also increases the likelihood that businesses will need to conform to stricter standards than their own, particularly when collaborating with healthcare or financial partners, with rigorous privacy and security demands. When companies need to perform analytics on highly sensitive data, for example, homomorphic encryption holds promise by implementing data sharing and data transformations that are performed exclusively with encrypted data, decrypting it only when a person needs to see a result.

Homomorphic encryption is not new, but being able to work with encrypted data without paying a heavy tax for computational time is new. In some instances, queries that would

have taken years to compute with the previous generation of homomorphic encryption can now be done in minutes or hours. This 'time tax' is still too costly in many instances, but will continue to see improvements as niche applications trickle out of research labs and into high-value business processes.

Technological solutions like these that address the historically cumbersome challenges of governance, accountability, and digital trust will continue to emerge. And businesses will use these same technologies to digitally transform business processes.

TECHNOLOGY	DESCRIPTION	GOVERNANCE	BENEFITS
Blockchain	The blockchain is a secure transaction ledger that is shared by all parties participating in an established, distributed network of computers.	<ul style="list-style-type: none"> Provides unprecedented levels of transparency No need for any single, central authority Self-reconciling ledger Single source for 'true data' 	<ul style="list-style-type: none"> Forensic traceability Participants in a transaction must sign with a private encryption key
Smart contracts ²³	The facilitation, verification, or enforcement of the performance or negotiation of a contract by computer protocols that makes a contractual clause unnecessary.	<ul style="list-style-type: none"> Rules for exchanges of value are designed-in (with self-reconciling features) Can be self-executing and/or self-enforcing 	<ul style="list-style-type: none"> Removes the need for a trusted third party to act as a governance/enforcement body
Differential privacy	A statistical technique that adds predictable amounts of noise to data, protecting the privacy of individual data subjects while preserving the accuracy of the insights derived from a large group of data subjects.	<ul style="list-style-type: none"> Can guarantee anonymity to data subjects, enabling privacy controls that might be required by strong governance 	<ul style="list-style-type: none"> Sought by firms looking to accept accountability for their data subjects' privacy
Homomorphic encryption	Ability to perform data exchanges and transformations exclusively with encrypted data, only decrypting it when a person needs to see a result.	<ul style="list-style-type: none"> Storing datasets in fully homomorphic repositories removes all chances for unplanned disclosures Only those entities with a private key can query the database, run analytics on the data, and see results 	<ul style="list-style-type: none"> Implementers of homomorphic encryption recognize the risks of improper data disclosure

TREND 5

With the relentless pace of change across industries, businesses must write the new rules of engagement themselves.

At the same time, these new digital industries are beginning to redefine relationships with partners, governments, and society itself. As the pace picks up, your company will need to employ new strategies, models, and technologies to remain competitive.

Defining the rules for new digital industries is the new corporate responsibility – and with great responsibility comes great opportunity. By acting now, your business can establish the rules for any new challengers in industries and ecosystems that are still emerging. And by demonstrating leadership in this space to customers, partners, and external agencies, your organization will enjoy expanded freedom and opportunities to innovate.



100-DAY PLAN

- 1** Understand your company's role among the ecosystems where you participate. Create a stakeholder map for each industry in which your company operates and catalog the ecosystems within these industries.
- 2** Make a list of ways your products and services influence society, and hold internal roundtable conversations focusing on this potential influence. Build a conscious strategy for influencing the social contract with a governance structure that ensures responsible and ethical influence.
- 3** Take inventory of data inputs to your organization. Focusing on areas where you receive personally identifiable information (PII), or where metadata could generate PII, enumerate the potential risks to highlight areas where new governance – for your company or industry – may be needed.
- 4** Highlight areas of innovation you're engaged in where improving or updating government regulation or industry/ecosystem rules would help to encourage innovation or economic growth.
- 5** Create a team to work with regulators at local, regional, and/or national levels. Efforts should focus on education, information sharing, and responsible growth of new industries. Commit to true collaboration with regulators, and to addressing their areas of concern. Reviewing *The Ethics of Data Sharing* will be helpful.

365-DAY PLAN



1 Look for the industries in the stakeholder map that are the newest areas of operation for your company. Research their regulatory history, and interview regulators and other industry participants to ascertain the current regulatory momentum. Share your findings with affected product managers and compliance officers.

2 Using the ecosystem catalog, identify the intersection of the industries you operate within, where you're growing, and which ones have the most opportunity for new ecosystems. Build a strategy for starting a new ecosystem to complement and accelerate your growth into new markets.

3 In recognition that your enterprise could be influencing the social contract, publish your governance model for public inspection, and begin implementing your strategy. Concentrate on recognizing the influence you already have and optimize for the behaviors you want to encourage.

4 From your data input inventory, work with the teams receiving those inputs, and collaborate with academic partners to pilot systems that make use of embedded-governance technologies: differential privacy, homomorphic encryption, and blockchain-based solutions.

5 Select a single initial area of innovation to engage with government regulators. Begin with individual conversations with multiple stakeholders; listen to their concerns and offer ways to share information and resources, encouraging future collaboration, as well as faster, more comprehensive development of regulations.

TREND 5 PREDICTIONS

1

Within three years, the new normal for businesses with mature digital strategies will be to operate across currently siloed industries as Tesla does today. For these companies, **industry boundaries will vanish**, and each new endeavor will amplify disruption.

2

By 2020, there will be entire **ecosystems requiring the use of smart contracts** in order to participate.

3

Within five years, new performance-based contracts – taking the form of ‘if/then/else’ between two or more parties – will exclusively be **smart contracts that self-govern and self-execute**.

4

In five years’ time, there will be numerous instances globally where **governments will cede rule-making authority** to industry groups or, minimally, enact regulations that were designed by an industry consortium.