AT Kearney

Digital Business Models in Shenzhen: The Silicon Valley of Hardware

Transforming your business with digital can reinvent the customer life cycle and open new revenue streams. When it comes to hardware, being in the right place at the right time is crucial—and this means being in Shenzhen now.

Now is the time to embrace digital business models and use connected products to reinvent the customer life cycle. In the Chinese metropolis of Shenzhen, this is done at high speed. The city's population has exploded tenfold in the past 30 years, and 5 percent of the city's GDP is spent on innovation—twice as much as in all of Germany. More than 340,000 engineers and scientists are developing new technologies in the so-called Silicon Valley of Hardware.

As a result, China is transforming from a manufacturer to a developer and designer of high-quality digital business models. In fact, 30 percent of the world's unicorn start-ups already have their home in China.

Shenzhen offers great opportunities for companies to develop and implement digital business models, especially ones that involve hardware. In this paper, we discuss the essence of digital business models and what it takes to win.

Hardware-Empowered Digital Natives Are Reshaping Industries

Every day, more than 2 billion people around the world create a network of connected devices. By 2020, 33 billion devices will be connected to the Web. This rise of the Internet of Things (IoT) and connected consumers opens promising new ways to acquire customers and generate recurring revenues. New players have toppled long-standing industries, challenging incumbents and their traditional business models. For example, WeChat mobile payments, a product of Shenzhen-based company Tencent, is making credit cards redundant in China. Broadcasting platform Huya is disrupting the traditional movie and television business. Bike-sharing system Mobike is transforming mobility in cities across China and Europe. Consumer electronics company Sonos is reshaping the music industry from hardware to content, and Winsun is shaking up construction with 3D-printed houses and office buildings.

In this new environment, traditional companies are finding it harder to sustain and grow their businesses (see figure 1). Effective digital business models capitalize on the momentum of digital disruptions. Many start-ups and digital giants have found success with innovative business models, but for most well-established companies, it is unexplored territory. The problem is not that they lack digital ideas, but rather that they lack focus and systematic prioritization of the business models that are both attractive and feasible. Moreover, aside from identifying the right business models, successful execution and short time-to-market have always been a challenge, especially when the business model encompasses hardware with digital features.

Figure 1
Digitization has disrupted the traditional business model

Disruptive technologies	Changing customer demands	Market development	New competition
... matured, scaled, and became cost-efficient in consumer electronics, accelerating connectivity in other industries.	**... for digital solutions and related convenience** enable digital business models, accelerating digitization.	**... toward new channels** such as social media and blogs to research and buy is creating a 360° customer experience as a key differentiator.	**... arises to compete for the software value cut** in digital business models to disrupt traditional manufacturers.

Source: A.T. Kearney analysis

Some firms act as if launching an innovative digital business model is a one-time task, but leaders know it is an ongoing process and that staying ahead of the competition means integrating it into the day-to-day business. Continuous innovation and implementing new concepts are essential. With this kind of thinking, former start-ups such as Xiaomi have outpaced incumbents such as Haier and Lenovo and are now challenging the competition in the West. In 2016, Xiaomi toppled Apple by capturing the largest market share of 17 percent of global wearables. The company is now in a head-to-head race with the trillion-dollar California-based company.

Using Hardware to Interact with Consumers Beyond a One-Time Sale

Digital business models have transformative value for three powerful reasons: they create access to new growth opportunities, open doors to recurring revenue streams, and protect companies from competition.

Forward-thinking companies are disrupting themselves before someone else does. For example, BSH Home Appliances has opened a new digital channel to interact with customers much more frequently via Home Connect, an app that allows people to monitor and control their appliances from a mobile device. Consumers enjoy convenience and value-added services while BSH receives invaluable usage and appliance data to fuel the company's innovation engine. This enables a virtuous circle of growth: more relevant products and services are developed, existing customers are secured and new ones are attracted, ultimately enabling BSH to build a competitive advantage.

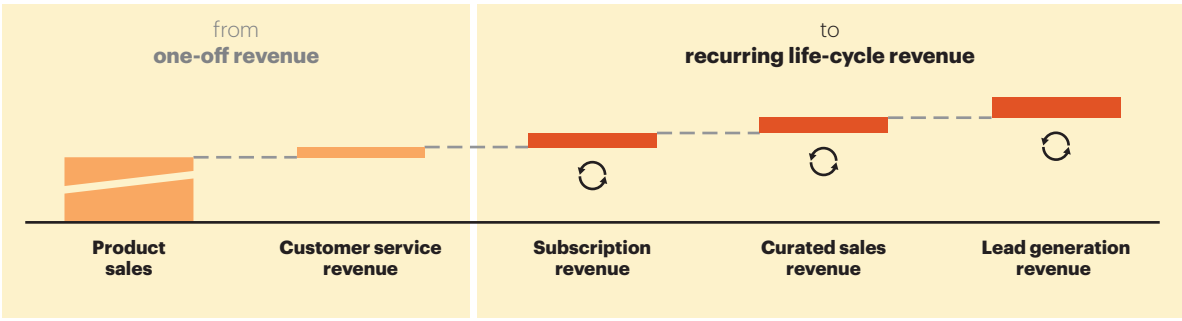
Offering innovation at the right time requires rapidly turning concepts into actual products. In Shenzhen, companies are well-positioned to react quickly to market changes in hardware demand and are prepared for a rapid go-to-market. For example, even though living in California at the time, Anker founder Steven Yang headquartered the company in Shenzhen to benefit from proximity to the supply chain and hardware know-how. Being at the heart of hardware development, the company was able to quickly expand its portfolio from laptop batteries to mobile charging devices, boosting sales from 100 units per day to 1,000 in less than a year. In 2016, the company launched its smart home brand Eufy, tapping into a new business field by capitalizing on the developed supply chain networks and development expertise.

Digital business models also create opportunities for growth by enabling a shift in the life-cycle paradigm (see figure 2 on page 3). For instance, a traditional company selling sound systems or voice-first devices can move beyond pure hardware sales by offering additional services such as music streaming or subscriptions. Apple is a prime example. Although still driven by hardware sales such as the iPhone, the company is expanding its service business with Apple Music (about 50 percent yearly revenue growth) and subscriptions sold via more than 30,000 third-party apps (more than 60 percent yearly revenue growth). Using its hardware as an entry point, Apple has built a steady service revenue stream that nearly doubled to about $10 billion per quarter in the past three years and is expected to contribute more than 50 percent of Apple's total revenue growth in the next five years.

With digital business models, the paradigm shifts from one-off revenues to recurring revenues along the entire life cycle. Again, quickly developing high-quality connected products is vital to staying ahead of the market, a road that inevitably leads to Shenzhen. Sonos, Amazon, and Bose—just to name a few—develop and build their products there.

Figure 2

Digital business models reveal new opportunities for growth



Source: A.T. Kearney analysis

Winning with Digital Business Models

Effective digital business models focus on a systematic, structured end-to-end process (see figure 3). A.T. Kearney kick-starts innovative digital business models with a fast-follower logic. There are already many outstanding ideas in the market to learn from. For example, the concepts for Tesla and the Apple Watch were not new when those leaders found their success. Others had tried but failed because of either bad timing or the wrong execution approach—or both. Rather than reinventing the wheel, leaders use best-of-breed thinking to refine an idea. In our work across a wide array of industries, we explore different but adjacent lines of business and build "disruption maps" to learn from. Then, we create potential use cases and uncover business opportunities from the major market trends.

We enrich the list of opportunities with ideas from the company and from design-thinking exercises. Then, we systematically assess each opportunity's relevance and feasibility with a deep understanding of value chains and control points, making sure the company focuses only on the opportunities where it has the right to win. Knowing where the company has an advantage can reveal what to do and what not to do. Then, we detail the prioritized opportunities, setting up a digital business model that creates access to recurring revenue streams—focusing on how to create, deliver, and capture value around a unique value proposition (see figure 4 on page 4).

Figure 3

Four steps to winning with digital business models

Explore	Choose	Prepare	Build and scale
Identify and prioritize business ideas based on relevance and the right to win.	Select the right execution mode for each idea based on control points.	Test before you invest by pretotyping to ensure you build the right it.	Build minimum viable products (MVPs) to find product–market fit and scale the business.

Source: A.T. Kearney analysis

Figure 4

Systematic innovation uncovers powerful business opportunities

Fast follower logic	Unfair advantage	Recurring revenues
Learn from disruption in adjacent industries, and understand how to win.	Capitalize on the unique control points where you have the right to play.	Tap into new business fields to access sources of continuous revenue.

Source: A.T. Kearney analysis

Systematic innovation of digital business models uncovers the most relevant and feasible business opportunities. Consider Xiaomi's reinvention: In 2011, the company started manufacturing affordable cell phones equipped with powerful hardware at a low margin, relying on software sales for profit. This low-cost, high-value strategy led to rapid growth in emerging markets using an online-only sales model. However, revenues took a plunge in 2016. Offering its products solely on e-commerce channels, Xiaomi had limited reach into rural China. Other Chinese low-cost players had seized this opportunity to build partnerships with rural retailers and captured significant revenue shares. To get back on track and build on prior successes, Xiaomi revolutionized its strategy. Knowing that brick-and-mortar stores are crucial to reaching rural areas but also aware of the heavy cost structure when only selling products that are purchased every couple of years, Xiaomi rapidly expanded its product portfolio by developing an ecosystem of about 100 hardware start-ups that provide other home IoT devices—from air purifiers to fitness bands—all using the Xiaomi IoT protocol. Coupled with Xiaomi's brand promise of low-cost and high-value, consumers were excited to frequently visit the stores to find innovative new products. Reinventing its core business model from a phone manufacturer to a full-scale consumer IoT company with an omni-channel strategy allowed Xiaomi to continue its growth journey. Leveraging its control points, Xiaomi is now transforming from being purely an IoT provider to controlling China's largest IoT platform. The company aims to reduce customer pain points by expanding its portfolio with an extensive range of IoT accessories along with digital services, allowing Xiaomi to access recurring revenue streams.

Digital Business Models Demand a Suitable Execution, Especially with Hardware

After identifying which new opportunities to pursue, the next step is to identify the right execution approach. Because each digital business model has unique requirements, getting the approach right is essential. Market leaders focus on five things: understanding the business model requirements, finding the right execution mechanism, establishing the organizational backbone, leveraging the right hardware partner ecosystem, and building physical minimum viable products (MVPs) with pre-validated value propositions.

Begin with assessing the business model requirements for execution. Dedicated execution modes do exist, some of which require heavy lifting by the core business and others that can be built up independently. To find the most successful execution archetypes, we studied more

than 30 companies, including Amazon, Alphabet, BSH Home Appliances, General Electric, BMW, and Johnson & Johnson.

Let's take a look at Johnson & Johnson's approach: In 2016, the company joined forces with one of Shenzhen's most famous hardware start-up accelerators, HAX. Together, they run four-month-long acceleration sprints for health-related start-ups in Shenzhen to find and execute business models outside their core business. The idea is simple but effective: Johnson & Johnson provides access to its unique control points such as its suppliers, manufacturing knowledge, and distribution networks. HAX selects suitable start-ups for the sprint from Shenzhen's rapidly growing health-related start-up scene and provides access to Shenzhen's prototyping and manufacturing experts. Stakes in promising start-ups can be acquired and a governance set in place according to the best approach. A recent example is the acquisition of a hardware-related start-up that uses LED wavelengths to treat acne. Because this is a non-core activity for Johnson & Johnson, the company decided not to integrate the start-up but to keep its strong entrepreneurial momentum by only implementing a small cross-company team providing a link between the two firms. This allowed the start-up to operate fast but also enabled access to Johnson & Johnson's unique control points, essentially creating an unfair advantage against competitors.

A.T. Kearney collaborates with companies to execute new digital business models based on what they require to be successful (see figure 5):

Figure 5
The right execution model will vary based on a company's needs

	Line transformation	Sprinter	Company builder	Strategic venture
Technology	Technology known to the world, complements existing technology, client has first pilots	Technology known to the world, brings on top functionality, client has first lighthouse pilots	Technology new to client, partially new to the rest of the world, first players emerging	High technological uncertainty, new to the world and to client
Market	Existing market changing with digital, value propositions to be tested	First market indications exist, but client still has to test value propositions to reach product–market fit		High market uncertainty, many bets needed to spread the risk
Assets	Value proposition dependent on client control points, client brands key asset	Scaling dependent on client control points, integration needed to some processes	Scaling independent of client control points, new control points must be built rapidly	Existing client control points not relevant or easily accessed at arms length
Team	Emerging team capabilities must be upgraded, ecosystem as complement	Client has some capabilities, but new ecosystem partners needed for co-creation	External capabilities and ecosystem required for co-creation, very limited client capability	Client needs capability to steer ventures, for execution completely new capabilities needed
Execution modes				

Source: A.T. Kearney analysis

- **Line transformation.** For internal transformations within existing business lines, we support our clients by setting up new internal structures and adapting core business processes.
- **Sprinter.** For digital business models that are adjacent to existing offers, our teams and partners in Shenzhen rapidly prototype and industrialize solutions for our clients within a few months by leveraging existing control points.
- **Company builder.** For digital business models aiming to create something completely new for our clients, we build and scale the offering independent of existing control points. Once again, we call on a stable network of partners in Shenzhen to launch a local company builder and scale a digital business model in the long run.
- **Strategic venture.** For digital business models aiming for a stake in tech disruption, we help our clients choose the right business fields to invest in to acquire new control points. Using our partner ecosystem, we then place ventures on-site in Shenzhen.

After we know the most suitable execution mode, we prepare to launch. The mission of building new digital business models often requires new people, capabilities, processes, and metrics. Early mistakes cost the most. To avoid these, we kick-start the journey by setting up and piloting the structures together with the new team. With digital business models, it is better to operationalize the example rather than map out theoretical solutions down to the last detail.

Pretotyping: Identifying the Right "It" Before You Build It

As soon as we have identified the right digital business model and prepared the execution, we use pretotyping to test customer demand. This hands-on method ensures that you are building the right It before you actually build it.

Pretotyping enables quick, cheap tests prior to extensive prototyping. This is a decisive factor, especially for hardware. Pretotyping measures the actual behavior of real consumers by collecting data from users, without disclosing our clients. A common method to measure interest is fake-door testing. After defining the hypothesis, advertisements point consumers to a product microsite where they go through the purchasing process without actually ordering the product (see sidebar on page 7: "Fake Door" Pretotyping Enables Car Retrofit). Tracking how many people would order the item demonstrates actual behavior, not intentions. Then, we can analyze the data points to either confirm the hypothesis and run a second, larger test or refine the hypothesis to try again. In a recent project, we generated more than 2.6 million impressions in two weeks. With click-through rates between 1 and 2 percent, thousands of consumers were led to a microsite to register for more information on the product—providing valuable insights on our hypothesis.

When pretotyping, understanding consumer behaviors and adhering to local policies are crucial, especially amid China's high regulatory restrictions. Chinese consumers are extremely sensitive to phishing scams and hard to impress because they are constantly surrounded by marketing stimuli. With strict regulations on campaign content, entity qualifications, and marketing instruments, companies must adapt their standard pretotyping approaches.

Nevertheless, China, and especially the tier-1 cities of Beijing, Shanghai, Guangzhou, Shenzhen, and Tianjin, offer a great platform for pretotyping and testing new business model value propositions with real customers. They all have dense populations exceeding 10 million people, of which 89 percent spend about 20 percent of their income online. Consumers young and old

"Fake Door" Pretotyping Enables Car Retrofit

Hypothesis. Five percent of consumers will buy a hardware retrofit device to turn their traditional car into a smart car.

Pretotyping approach. We put images of a 3D-printed hardware device on a website, presenting it as a final working product and generating traffic via ads on social media. When a consumer tries to order the retrofit kit, a pop-up says the product is sold out but that a second version is being developed.

Results. By tracking how many consumers would order the device, we can evaluate our hypothesis based on actual behavior and decide whether to launch more tests or build a prototype.

are tech-savvy, demanding, knowledgeable, and involved in digital business models—creating a very dynamic market and a superior testing ground.

Pretotyping creates a shorter time-to-market, a steeper learning curve, innovation close to the customer, cheaper failures, and less bias in idea selection. A good example is the smart chopsticks Baidu Kuaisou, which started out as an April Fool's video for utensils that could detect reused oil, which is a major food safety issue in China. At the time, Baidu had no plans to develop the chopsticks, but after 2.7 million people watched the video in four hours and more than 100 million comments were made in a few days, the company saw the massive demand and developed chopsticks that give a warning when they come in contact with reused oil. Users then get details and instructions via an app on their phone.

Making Sure Great Ideas Deliver

It's time to build. Once the right it is identified, the next step is to build the first prototype and an MVP, followed by launching the first pilots into the market to scale the customer base. For hardware, you need to be in the right place with the right design, quality, software, and pricing—and the right people. Over the past several years, Shenzhen has become the go-to place for designing and developing hardware, software, and business models. Only a taxi ride away from Hong Kong, Shenzhen offers a unique infrastructure to develop and build innovative high-tech and IoT hardware.

"If you build hardware, you have to come to Shenzhen," said Chad Xu, co-founder and CEO of Shenzhen Valley Ventures (SVV). "We are able to offer made-to-measure IoT solutions including smart hardware and software." In Shenzhen, highly complex IoT hardware is developed in a matter of months, outpacing any other region in the world in speed, quality, and pricing. If our clients say they want to learn how to do it, they come sit and work with engineers in Shenzhen. That is the core offering and value proposition of A.T. Kearney and our partners. "In Shenzhen, it is really Day 1 for hundreds of firms that compete in digitization, IoT, and AI." Xu said.

Forward-thinking Western incumbents can benefit from this infrastructure and advanced capabilities via local partnerships. Instead of taking the typical two years to develop a simple IoT device, they can work with A.T. Kearney and our partners such as SVV to build a product from scratch and get it certified within six months. Beyond deep engineering know-how, SVV brings along an ecosystem of local partners that grew over 20 years. Once built, the MVP is rolled out in a first pilot, for example, in a specific region or with a specific customer group, to allow testing to

prove the product–market fit. Testing, pivoting, and multiple iterations are of utmost importance to ensure the final product is in demand by the target customers and those who are willing to pay for it.

A remarkable example is the Chinese start-up Mofun, which began equipping taxi seats in the Shenzhen area with retrofitted IoT massage devices in the summer of 2018 (see figure 6). At the automaker BYD, where taxi drivers pick up their new cars, Mofun's sales team approached drivers to install the MVP massage seats free of charge, accepting a revenue cut of about 45 percent for the drivers as incentive. Taxi guests can then scan a barcode to get a massage for 75 cents. Within one month of deployment, Mofun gathered an abundance of statistics—for example, learning that the product is most frequently used for 15-minute massages during trips to the airport. The results are detailed and ample enough for user profiling, use case identification and confirmation, and continuous improvement. Less than four weeks after its launch, Mofun released a second version of the device and is planning to scale it to private cars. In a city where some 1,000 new companies emerge every day (compared with 800 in all of Germany), Mofun reveals that establishing control points to secure a phenomenal future requires agile and pragmatic first steps.

Figure 6

Chinese start-up equipped taxis with massaging seats to quickly test the product–market fit

Equip taxis with a retrofit device.

Set up a pragmatic interface with a barcode for users to scan.

Provide an easy checkout solution.

Capture lessons learned and iterate.

Sources: Mofun; A.T. Kearney analysis

Start today – Be Smart, Brave, and Open

Building new digital business models requires getting a few things right. Many companies have long development processes for hardware—three years or more—leaving them with outdated products that don't sell. We recommend taking a fresh new approach:

Be Shenzhen-fast. Stop using traditional methods to tackle new challenges. Go where the magic is happening—Shenzhen, the design and manufacturing hub of China—where you can find start-ups that quickly develop hardware prototypes so you can focus on scaling your business model. Becoming the high-quality, fast-prototyping hub for makers, Shenzhen is rapidly evolving and attracting new talent.

Be brave. Digital business models require patience with profitability and a focus on scaling. For hardware business models, combine traditional criteria such as product quality and non-traditional ones such as product–market fit to measure success. Especially at the beginning, the focus must be on proving value and the growth hypotheses of the underlying scaling path. Cultivate an environment that embraces learning as well as trial and error. Experimenting and pivoting are vital to finding the right digital business model.

Be open. Traditional companies cannot do it alone. They must partner with others in the ecosystem to deliver relevant value to their customers. For hardware, Shenzhen offers everything you can imagine: readily available technology, an engineers' paradise with immediate access to electronic parts at low prices, a quick way into production, and unlimited access to a community of skilled engineers. Identifying the right partners requires listening to the market and to your customers to find inspiration. A.T. Kearney brings along partners with local expertise that grew over two decades, with projects ranging from major Western companies to rising stars such as Xiaomi.

Now Is the Time to Begin

Disrupt your business at Shenzhen speed—before Shenzhen disrupts it without you. Companies with an eye on revamping their business models have much to learn from the mistakes that others have already made. A.T. Kearney has a proven track record in business-to-business and business-to-consumer environments across a variety of industries from steel, automotive, and telecommunications to white goods, insurance, and banking. This broad experience gives us in-depth insights into best practices and the most common pitfalls. We know how to do it right—from innovation and building hardware pretotypes to scaling your digital business model. Our ecosystem and foothold in Shenzhen offer you quick access to the right partners so you can build the right it at Shenzhen speed. Our entrepreneurial mind-set and operations DNA make us a great partner on this important and exciting journey.

To learn more about how A.T. Kearney can work with you on this digital journey, visit us online at www.atkearney.com/digital-transformation/digital-business-models or contact us for more information.

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The signature of our namesake and founder, Andrew Thomas Kearney, on the cover of this document represents our pledge to live the values he instilled in our firm and uphold his commitment to ensuring "essential rightness" in all that we do.

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