Program your business model through digital density

The growth of data generates many interactions between organizations, people and things, and executives must identify what elements of their value proposition can be programmed.

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The world's first car was invented in 1886 with one main purpose: moving people from point A to point B faster than a horse-drawn carriage. Fast-forward to 2017 and today's cars are more akin to roving computers with mechanical peripherals. Unlike the drivers of yesteryear, modern motorists get behind the wheel, buckle up — and then link their smartphones to a diagnostic interface and access real-time data such as their gas consumption and driving habits. In the course of a century, the concept of a car as a means of transport has been transformed.

This is just one example of the Internet of Things (IoT). When a thing — in this case, a car — is embedded with an internet connection and paired with a smartphone, it is instantly capable of communicating a plethora of rich, useful data. Increasingly, these digital connections are redefining the boundaries of competition and reshaping the sources of customer value.

In this article, I will present a framework that can help senior executives create and capture value by tapping this pool of connected data and pinpointing the programmable elements of their value proposition.

Understanding the power of digital density

IoT is not a passing fad. It represents something big: the power of being able to remotely access data generated not only by organizations and people but also *things*, regardless of their physical location, and make meaningful interactions between them. In this sense, connected data become an abstraction of the physical entity itself, which can be remotely observed, monitored and/or controlled.

Over the past 25 years, wave after wave of digital technologies have driven a steady growth of internet connections and afforded new opportunities for value creation. In the 1990s, all eyes were on the World Wide Web, which allowed consumers to purchase goods and services that used to only be accessible in-store. Since then, the tech industry has advanced at breakneck speed, introducing a raft of new concepts — from social media, Web 2.0, mobility and big data to cloud computing, virtual reality, robots and artificial intelligence.

The tendency to consider each technological innovation as an isolated phenomenon makes it difficult for senior executives to grasp their business potential. Yet all these technologies are manifestations of an overarching concept known as digital density.

Digital density occurs as a function of the number of organizations, people and things that

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are connected. A mere decade since the first smartphone, these connections now number in the billions.

To better understand the power of digital density, let's start by examining its two basic components — connections and data — both of which have exploded, thanks to the falling costs and expanding power of IT, and which have now reached a tipping point.

CONNECTIONS. Connections refer to the ability to link any element of the physical world — organizations, people and things — to the internet. Over the past three decades, the number of persistent connections has grown exponentially, with "persistent" defined as 24/7, always-on access, to enable unconstrained interactions and information transfers.

In the 1980s, only medium- to large-sized organizations with healthy IT budgets were connected to the internet. Outside these confines, the rest of the world remained in the unconnected dark, hindered by the high cost and complexity of technology. As Moore's law of exponentially faster, cheaper computing was realized, costs went down and technology was able to penetrate consumer markets.

During the 1990s, internet access spread to households, first with dial-up modems, then with ADSL and cable, and now with fiber optics.

The introduction of smartphones in the mid-2000s broke yet another barrier of physical space, as cell phones turned into portable computers that connected people on the go, regardless of their location. According to the business intelligence portal Statista, the installed base of IoT devices is forecast to reach 31 billion worldwide by 2020. And every time a new entity is connected, another order of magnitude is added.

DATA. The sheer volume of connected data has shaped and transformed the digital universe over the past two decades as well. In the 1990s, most of the world's data were analog, meaning that data were rendered in physical form, as printed material, for example. By 2007, the global volume of digitally connected data had reached critical mass.

The capacity to combine connections and data, and cross them with other connected data, generates myriad interactions that grow exponentially and combinatorially. However, not all of these interactions are meaningful, so the role of the executive is to select or code the ones of interest to reap the most benefits of digital density. Doing so can result in greater levels of efficiency, coordination and personalization, as well as an enhanced ability to anticipate change.

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Digital transformation and disruption

The percentage of connected data per unit of activity — aka digital density — is often used to gauge a sector's potential to generate new business models. A unit of activity can be anything from a business unit, organization or sector, to a city, region or country. As digital density intensifies, the once sharply defined lines between the digital and physical worlds begin to fade, forging a new, blended environment, in a process known as digital transformation.

According to my IESE colleague Joan E. Ricart, a business model entails identifying "a new approach" for creating and capturing value to exploit business opportunities. This new approach relates to the set of interactions, both front- and back-end, involved in creating a value proposition. With this definition in mind, the rise of digital density can exert various effects, but for the purposes of this article, I will highlight two key ones.

First, it can trigger disintermediation, undermining a company's ability to monetize its value creation: think of the effect of Amazon on brick-and-mortar bookstores, or LinkedIn on conventional headhunting.

Second, digital density can spark the creation of entirely new business models that were inconceivable before. Uber's business model — connecting passengers and available drivers in real time — is only made possible through the mass adoption of smartphones. Until recently, there simply weren't enough people with mobile internet access to sustain such a business model.

Car dealerships are another case in point. Traditionally, dealerships provided the setting for both the discovery and buying phases of the customer journey, with would-be buyers visiting the showroom an average of five times before making the purchase. Today's car buyers, however, do much of the legwork online to decide which model best suits their needs and, more often than not, make a lone visit to the dealership to fill out the paperwork and drive their new car off the lot. This paradigm shift has forced dealerships to redesign their business model. Tesla, for example, uses its showrooms to display models for potential buyers but sells its cars through its website.

In any given sector, the magnitude of digital transformation is directly related to its level of digital density. As such, its impact on the business model can run the gamut — from rattling the front-end structure, as in the case of car dealers, to upending every dimension of the industry, as in the case of Uber and the taxi business model.

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While these examples are specific to the automotive and transportation sectors, other industries can harness digital density to exploit untapped opportunities. How? An analysis of the digital transformation architecture may provide some insights.

New business model possibilities

Powered by digital density, digital transformation has altered how global industries perform their core activities, serve customer needs, generate fresh value propositions and capture new opportunities. Let's break this phenomenon down.

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