Winning the digital transformation race requires new business strategies

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Industry digitalization is heading into deeper water. Manufacturing, services, and other traditionally non-data-intensive industries have begun generating large amounts of data. Data, in fact, has become one of the key elements of production. Meanwhile, ICT has become tightly integrated with all industries, changing from a support function to a production system.

By William Xu, Huawei Chief Strategy Marketing Officer

The aim of enterprise digitalization is no longer just to achieve higher efficiency in existing business; rather, it is to create value in new business. Witness the advent of "digital production," the processing of data in a way that creates value and allows enterprises to provide digital products and services.

The concept of digital production can be traced back to a late 20th-century project involving the Joint Strike Fighter in the US military. This project required the development of an aircraft capable of simultaneously meeting the different needs of the Air Force, the Navy, and the Marine Corps.

To meet the project deadline, defense contractor Lockheed Martin led a task force made up of 50 companies from 30 countries using digital design, development, and management methods. The results were impressive: the design time, number of components, and design, manufacturing, and maintenance costs were cut in half, while manufacturing time was reduced by 67 percent, and assembly work fell by 90 percent.

Digital production will soon extend beyond high-value sectors, such as the military and aviation, to

William Xu

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encompass many other industries. For example, WeChat, China's leading social media platform, uses data for targeted advertising. GE uses data to predict when aircraft engines will require maintenance. Hospitals use data to determine when someone may contract an illness. And governments use data to operate smart city programs. One day, nearly all companies will use digital production.

Controlling core data

Smart hardware and the Internet of Things (IoT) generate huge amounts of data. Whether you're running, driving, shopping, or even sleeping, basically anything you do is generating a digital footprint.

Enterprises can use analytics, AI, and other technologies to extract more value from that data. In the first half of 2017, Tesla sold just 47,000 vehicles, but its current market value is higher than GM, which sold 4.7 million vehicles during the same period. A major reason is that Tesla collects massive amounts of data from its self-driving vehicles, then uses it to improve the technology.

How should traditional enterprises establish a strategy for turning data into a competitive strength?

The first step is to start generating data from assets. For enterprises, digital transformation requires three types of data: customer data, operational data, and asset data, including information about products and services. Of these categories, asset data is the key to digitalizing production; it is also unique to each industry, so difficulties faced by different industries can vary significantly. Sectors such as finance, e-commerce, and telecom are data-intensive, whereas manufacturing and public services will probably need to modify their assets before they can collect all the data they need. For example, GE uses several hundred sensors on its aircraft engines that continually spit out a stream of data. The bike-sharing company, ofo, uses narrowband IoT (NB-IoT) technology to collect data from bikes, even when they're parked underground.

The next step is to make data flow. This means enterprises must evolve beyond having each department collect and manage data separately, and instead begin to create a single unified database. Through proper data governance, data can be kept consistent and can be shared, making it "flow" and generate value.

> Insight from digital twins will help us to automate network operations, provision applications, and perform network maintenance.

The third and most important step is product modeling. For each of their core products, enterprises must build something like a "digital twin," a term coined 14 years ago by Professor Michael Grieves at the University of Michigan. A digital twin is a virtual model of a physical asset, such as a jet engine. Digital twins enable two-way communication between the digital and physical worlds. They also create a feedback loop that can maximize the value of the data generated by the physical asset.

The idea behind a digital twin is to have a digital replica that enables real-time and monitoring of physical products as they operate. This helps prevent risks, allows the asset to be controlled remotely, and generates valuable data about how the asset is performing.

Digital twins can improve efficiency in activities including R&D validation, sales, manufacturing, supply, delivery, and the operations and maintenance of physical

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products. Gartner forecasts that within five years, hundreds of millions of physical objects will have digital twins.

Huawei's explorations in wireless communications are a good example of how value can be created from data. By leveraging the data accumulated from its network of roughly 3.5 million cellular base stations, Huawei built a digital twin of its base station products. Data gleaned from this effort allowed us to reduce costs and improve efficiency.

Transforming production systems

With a clearly-defined data strategy, enterprises can consider integrating devices, networks, and the cloud, and working to build a powerful digital production system. The result of this is a virtuous cycle where data turns into opportunities, opportunities turn into services, and services turn into revenue.

First, production can be modified at the device level. Digital production requires that a large quantity of information be sent from devices and equipment, which means that machines need to be able to "speak." With sensors spitting out a constant stream of data, actions are turned into records, records become data, and data enters systems.

Many scenarios also require smart devices to have edge computing capabilities. According to some estimates, a self-driving car generates a gigabyte of data every second. To process such a large volume of data in real time requires the use of edge computing.

At the network level, digital production requires that all of an enterprise's assets and equipment be connected and managed. Special networks, such as NB-IoT, are needed to maintain large numbers of connections with low power consumption over long distances. Enterprises also need to use campus networks, professional security services, and other means to ensure the security of data transmissions.

Reshaping customer value

Traditionally, the fundamental value that an enterprise provided to its customers did not change much over time. For example, an automaker provided value to customers relating to things like transportation, safety, comfort, and status. But in the digital age, technological advances have greatly reduced the time and cost of turning data into opportunities. Services that were once expensive to provide are now much more affordable. Formerly smaller-scale services are becoming much larger in scale, and some services that were not feasible to provide in the past can now be easily offered

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to customers. Large-scale digital services are becoming increasingly lucrative. We are beginning to see a transition of value from traditional products and services toward digital services.

Digital services don't just emerge out of thin air. The major pacesetters in global digital transformation have approached the challenge by relying on their existing competitive products. Building upon this foundation, they have integrated ICT and their deep understanding of their industry to provide digital services to customers. Enterprises need to find a way to get their foot in the door with respect to digitalization by considering their current situation. This, in turn, will help them find new business opportunities and reshape the value they bring to customers.

Enterprises involved in traditional manufacturing can install sensors on their most competitive products and build a digital production system that integrates devices, networks, and the cloud. By analyzing and utilizing real-time data, companies can transition from selling tangible products to offering digital services. For example, GE no longer directly sells aircraft engines. Instead, they sell engine flight hours, and provide flight services including real-time diagnosis and dynamic maintenance, fault prediction, and fuel line planning. The German farm equipment company Holmer provides preventative maintenance services for the 3,500 sugar beet harvesters it has sold globally, reducing maintenance costs by 30 percent.

Interest in ICT is also surging in traditional service industries, as participants seek to reshape core businesses and transition towards providing digital services. For example, telecom operators are beginning to provide video, cloud computing, and other services on top of their connectivity services. Banks are transitioning toward digital banking. As a first foray into big data and AI in the insurance industry, China Pacific Insurance recently launched the industry's first intelligent insurance advisor, Alpha Insurance, which relies on data accumulated from the company's 110 million insurance clients. Just four days after its launch, the service had been accessed more than 2 million times. Innovations and value creation based on digital transformation are occurring across many other sectors, including transportation, water utilities, agriculture, and public safety.

Digital transformation is a bridge every enterprise must cross. Leading companies already feel pressure from competitors and sense the pace of change across the ecosystem. Opportunity waits for no one, and the digital era calls for decisiveness. If we don't act, opportunities to boost competitiveness and enhance business performance will be lost, perhaps for good.