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Mapping the Digital Economy

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The Digital Economy Economic Growth and Investment in Connectivity Infrastructure

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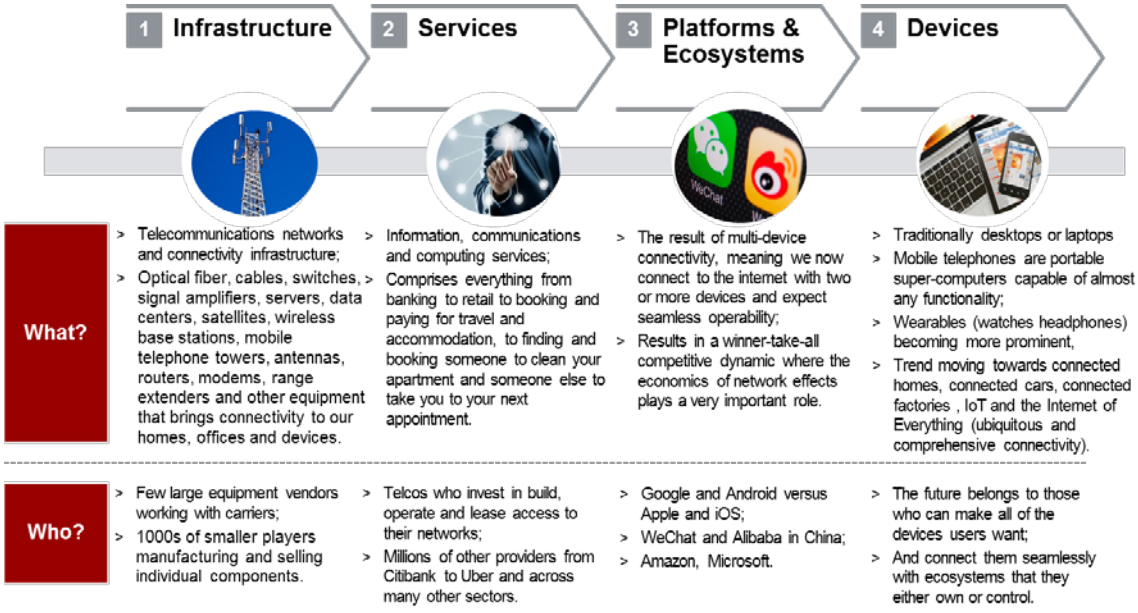
I. Mapping the Digital Economy

As part of a recent analysis on the emerging set of international treaty commitments intended to place some disciplines on how governments can and cannot intervene to regulate different aspects of the digital economy, we carried out a mapping exercise of just what makes up this (relatively) new phenomenon. The graphic below is an attempt to encapsulate this as succinctly as possible.



Section 1 of this contribution discusses each segment in more detail and provides some insights after more than a year of working on this issue for Huawei.

Let's start with infrastructure. The infrastructure required to power the digital economy largely consists of telecommunications networks and the underlying backbone equipment such as optical fiber, coaxial cables, switches, signal amplifiers, servers, data centers, satellites, wireless base stations, mobile telephone towers, antennas, routers, modems, range extenders and other "hard" infrastructure elements that bring connectivity to our homes, offices and devices (discussed in more detail below). Except for those in the industry, these elements are largely invisible to most users, unless of course connectivity is disrupted or lost, in which case its absence is suddenly sorely felt by all. Telecommunications networks have been subject to a number of path-breaking technological innovations over the last few decades, whereby we have moved from analog telecommunications networks that "only" carried voice or audiovisual radio signals, to the present digital age of broadband internet communication networks that carry huge and ever-increasing amounts of data at increasingly faster speeds.

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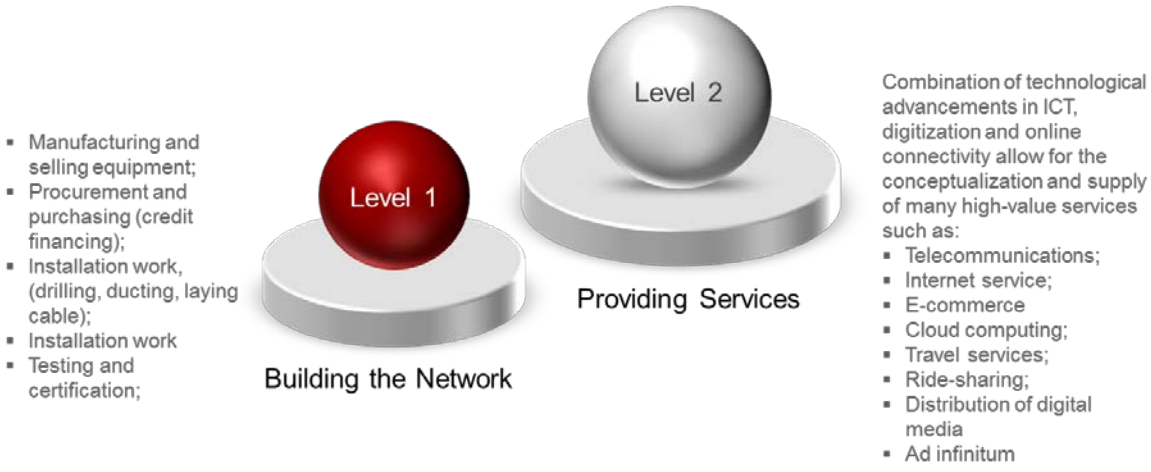
Next let's discuss services, the really exciting part of the digital economy. The provision of services is the whole reason the infrastructure described above is built and operated in the first place. Telecommunications services previously just meant voice calls (and before that the provision of telegraph and telex services). These services have since morphed to first include fax communications (now barely used) and then later email services. They now encompass the provision of broadband internet connectivity which is used to transmit and receive all kinds of data, from voice, to audio, to text, to images and video. The services side of the digital economy has experienced explosive growth on the back of the internet connectivity provided by telecommunications networks. Whereas the services offerings of telecommunications networks traditionally comprised the transmission of voice signals, telex, fax messages, and later short-message-system (SMS) texts, the trend more recently is for all kinds of content to be downloaded and uploaded over the top of these networks (leading to the distinction between OTT services suppliers and traditional carrier operators), as we have moved from fixed local area network (LAN) connections (usually to desktop or portable computers) to a world of mobile wireless connectivity (directly to handheld devices such as smartphones, tablets or wearables). This has had profound implications for the kinds of services that are now provided and consumed in the digital economy.

Next let's turn to platforms and ecosystems, where we have seen and continue to see an incredible amount of innovation. This space in the digital economy has arguably only emerged thanks to the rise of multi-device connectivity, meaning we now connect to the internet with at least two devices and in some cases more. It is also a space that has opened up as the range of services provided in the digital economy has expanded, allowing all-in-one or multi-pallet solution providers to emerge. Thus, where we used to only connect to the internet using either our desktop or portable computers, a simple and largely binary choice had to be made between Microsoft's Windows or Apple. Today, different platforms and ecosystems (of apps and digital content) have emerged to try and capture as much of users' online activity across as many devices as possible.

Often these platforms started out as something much more modest such as a search engine (in the case of Google) or a social network (in the case of Facebook), before expanding into something considerably more all-encompassing. Today, it is increasingly recognized by analysts and observers that successfully future-proofing a business model in the internet economy either means evolving to become a major platform or partnering with one of these platforms to reach as many users as possible. These platforms or ecosystems comprise both operating systems, app economies, as well as interaction, communication and content spaces to which users turn for a plurality of their online needs. Many of them have incorporated software and digital content products (e-books, music and video) that used to be goods in their previous incarnations when they were supplied on CDs, video tapes, cartridges and floppy disks. Such products form a special subset that are neither goods nor services, often denoted by trade experts as digital products.

Finally we discuss devices, a space that continues to evolve, mostly in annual or semi-annual product cycles. The devices segment of the digital economy is where the user or consumer interfaces with the whole range of goods, services and solutions on offer to him or her online. This part of the digital economy is about getting people staring at their screens and using the functionality offered by their devices to consume, interact, use and engage, either with other users, with sellers, service providers or in fact any of the many other stakeholders in the digital economy. Devices are a crucial aspect of the digital economy but not all the big players described above sell their own devices, although of course all of them make sure that what they offer can be accessed by almost any devices. Below we first discuss desktop and portable computers, before discussing tablets, detachable tablets, smartphones and finally wearables.

II. The Digital Economy and Economic Growth

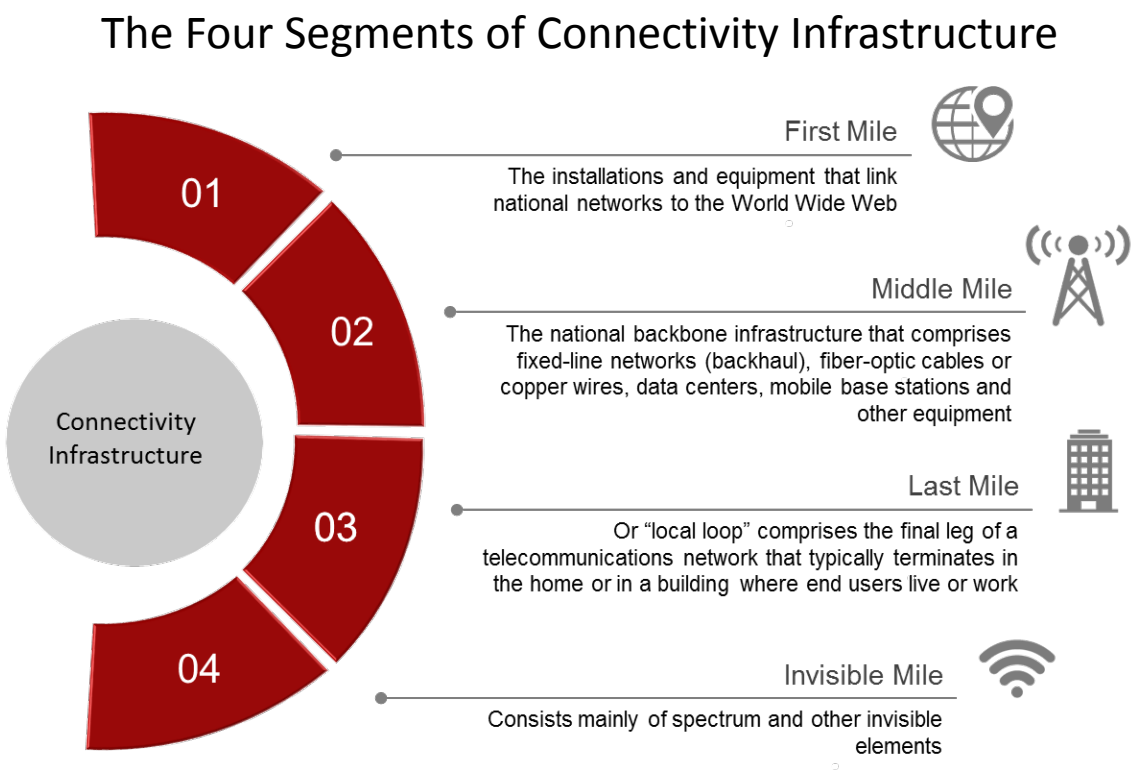


Much has been written over the last two decades about the role of ICT, digitization and the internet in supporting economic growth in industrial countries and fostering economic development in developing countries.

On the economic growth side, the consensus among economists seems to gravitate towards differentiating between the so-called "**first level**" effects on the one hand and secondary or indirect positive effects on the other. The first of these are the direct result of increased investment in the underlying infrastructure and the economic activity this inevitably entails, such as manufacturing and selling the equipment, its purchase (and any credit financing involved), as well as any installation work, drilling, ducting, deploying and testing of the equipment.

The **secondary and ultimately more important economic growth effects** that stem from the alignment of technological advancements in ICT, digitization and online connectivity are generally attributed to their combined role in offering platforms for the provision of a whole range of conventional and new services, from telecommunications to services that nobody had previously really thought of providing and/or consuming online (ride-sharing to name one, buying and listening to music to name another).

III. Investing in Connectivity Infrastructure



Rather than just being a simple issue of money, different policy interventions can spur and facilitate investment in each of these four areas by means of various policy interventions.

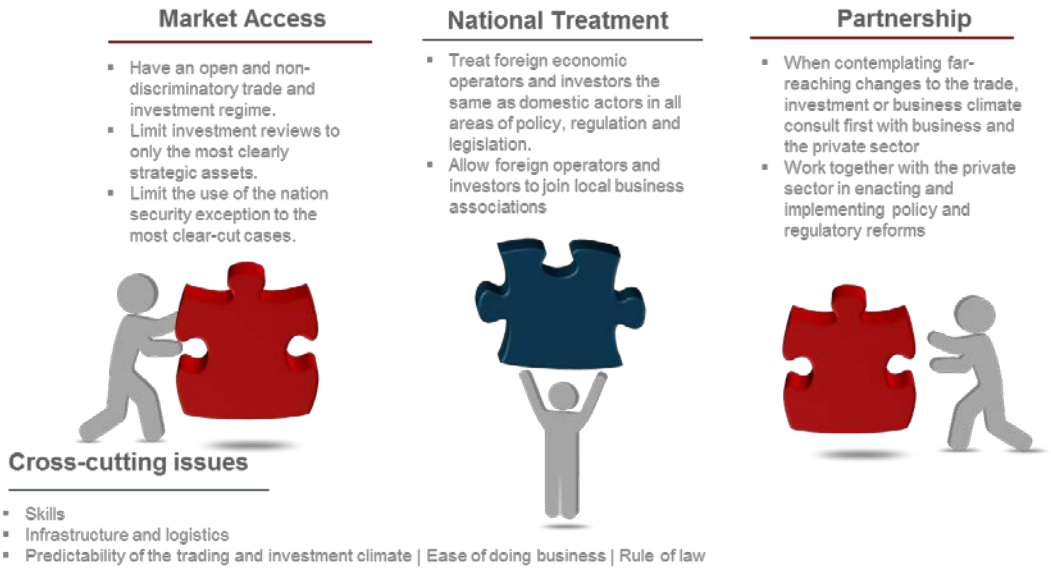
For the first mile for example, the regulatory regime governing the acquisition and operation of satellite dishes and the competitive conditions that apply to international gateways and landing stations will dictate the degree of interest that private sector actors will have in deploying and managing this critical infrastructure.

For the middle mile the competitive environment is also very important, with the role of the regulator being to find the right balance between ensuring competition while also ensuring that those who do take on the risk of investing in and operating infrastructure see a commensurate return on their investments. But there are also other policy disposal to increase the attractiveness of investing in the buildout of infrastructure, including subsidies, co-financing arrangements and reducing the cost of importing equipment and components (import tariffs and other trade costs). Governments can also require by law that any digging done for transport or energy infrastructure (roads, railways, gas or electricity pipelines) also provide for optical fiber to be laid at the same.

For the last mile, government intervention that encourages and incentivizes the owners of network assets to cooperate with competing providers or even those providing different services over the same infrastructure (inter-modal competition) is one option regulators have to raise the attractiveness of this segment. Governments can also provide grants to home owners to upgrade their legacy copper wiring and replace it with optical fiber (so-called Fiber to the Home or FTTH), or provide tax or other incentives for building developers to future proof their projects by laying fiber to the building (FTTB).

Finally for the invisible mile, the many ways in which spectrum is governed constitute the primary levers by which governments can encourage investment and optimize the use of this scarce resource. Particularly ensuring that more of it is made available at prices that make its exploitation commercially viable is something that governments should prioritize. Other important ways in which governments can regulate in this space is to ensure that access to spectrum is provided on competitive terms, that essential fixed assets are shared among operators, while finally allowing those who purchase spectrum to resell it without too many restrictions or conditions being imposed upon doing so.

IV. Characteristics of an Optimal Trade and Investment Regime



This last graphic discusses some of the most important trade and investment policy principles that governments would be well advised to consider when enacting laws and regulations to implement their policy priorities for the digital economy.

Market access is of course a key concern for all actors in the digital economy, namely the ability to enter markets without being subject to arbitrary barriers and discrimination. In the same vein, limiting investment reviews to only the most strategic assets can be helpful and play an important signaling role in attracting foreign economic operators as well as FDI.

National treatment, meaning treating foreign economic actors the same as domestic players is also a very important precondition for attracting foreign talent, entrepreneurs and capital. Also allowing foreign economic actors to participate in domestic trade associations is also very important to help them contribute to the policy-making and formulation processes.

Adopting a multi-stakeholder approach to digital governance and viewing the private sector as a partner rather than as just something to be taxed and regulated also can help ensure that the laws and regulations that are enacted do not have any unforeseen consequences and actually achieve the policy objectives they are intended to.

Finally there are cross-cutting issues like boosting digital skills, investing in infrastructure like communications networks, roads, ports, and ensuring that the business climate and investment regime is as predictable as possible are things that again exert a strong magnetic force on foreign economic operators and help to attract FDI.