Point of View

Connected Communities: Supporting Economic Development and Social Equality through the Broadband Economy

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Point of View: Connected Communities

Digital Cities, Smart Cities, or Knowledge Societies: the idea of the Connected Community has been fueled by the universal availability of broadband Internet access. But it is not enough simply to deliver broadband and wait for citizens and organizations to discover what they can do with it. Cisco's concept of Connected Communities recognizes that it is the value delivered by network-based services and applications that will drive collaboration and innovation and generate the return on investment envisioned by governments seeking to empower their countries with ICT-based economies. With a Connected Communities initiative, policymakers have the capability to build the vision, develop the operating model, and deliver the infrastructure that will underpin continued and increasing competitiveness of a nation in the rapidly changing world economy.

In Emerging Markets, Cisco IBSG works with leaders of key national and regional government agencies, businesses, communities, multilateral institutions, and NGOs to turn their technology investments into strategic national assets. Serving as trusted advisers in varied assignments spanning broadband connectivity, digital inclusion, smart communities, and business productivity, IBSG aligns ICT to support socioeconomic development in these countries. Connected Communities is IBSG's approach to harnessing the power of ICT to serve the country's self-sustaining economic communities and transformation agenda.

Executive Summary

Growing numbers of success stories from around the world are showing how broadband-enabled economies can deliver major social and economic benefits to the communities they serve. In many nations, however, there are historical, structural, and economic factors that can work against the full implementation of a broadband-based economic strategy.

The critical issue is that broadband availability is not enough. It is the delivery of relevant services that are valued by users—citizens, commercial interests, and government—that brings the economy to life and generates the benefits that drive sustainable growth. This principle is embodied in the concept of the Connected Community.

To achieve this kind of infrastructure, governments must have a services vision—a model and process for defining the minimum set of services needed to reach the established economic and social objectives. The model should incorporate services in multiple categories, including access, enabling services, public services, and industrial and residential services.

With the vision established, an operating model is required to address the challenges arising from the historical structure of the telecommunications industry within the country. This should encompass a proposal for a new set of telecommunications industry guidelines, which can align the industry structure with current technology and government objectives.

Finally, an execution vehicle must be developed, allowing government to play a proactive role as the orchestrator both of the infrastructure and the services ecosystems. The role of service providers (SPs) in this process also is a key consideration; the strategy must incorporate a market structure that makes it economically viable for SPs to participate in a role with long-term financial sustainability and adequate rewards for the SPs' business activity.

With this process accepted and adopted, the path is clear for the implementation of a Connected Community strategy that unleashes the full economic potential of an advanced information and communications technology (ICT) infrastructure. At the local level, it can include concepts such as Connected Health and Connected Learning that deliver benefits to specific economic sectors, while at the national level it provides the foundation for the emergence of the country as a Connected Nation—a formidable and successful competitor in the technology-driven, global economy.

Introduction

The Cisco® concept of the Connected Community sets out the essential concepts and processes that lead to the implementation of a national infrastructure that will create a sustainable broadband economy. It describes an approach in which the key services and activities that underpin communities—from commerce and government to services such as health and education—are linked by a resilient, scalable, and ubiquitous ICT infrastructure that delivers relevant applications and services to the users that need them.

Value is the critical issue. If the functions and resources made available by the infrastructure are of value to users, then they will make use of the system, generating the return on investment envisaged by the strategy. These functions may be specific in their application, such as specialist resources delivered to health services or the education sector via Cisco's Connected Health and Connected Learning initiatives. Or they may be

more broad-based, such as the capabilities required to implement Cisco programs like Connected SMBs or Connected Government.

Once a country has begun to develop Connected Communities, sometimes known as Digital Cities or Smart Cities, the foundations are in place for a smoother evolution to Connected Nation status, in which the country as a whole is equipped to participate as an effective competitor in the world economy.

Issues and Challenges

Making this happen is not always easy. Consider some of the most significant challenges:

- **Vision.** It is easy to recognize technology as a key success factor for a city, region, or country, but it is hard to identify the precise leverage points where technology can deliver the greatest value. A true technology vision requires a lot of detail. Sector by sector, a specific vision is needed to understand which services are required, how those services will link economic players together, and how all this plays out to deliver a set of targeted economic and social benefits.
- **Economics.** According to today's technology and business models, broadband is not for everyone. The economics of broadband deployment require service providers to prioritize densely populated and affluent urban centers over rural areas, which have lower density of demand. Because capital expenditure is limited, the infrastructure deployment process can leave large portions of the world's population without connectivity. This is the so-called "digital divide," and is one of many issues arising from the economics of running a telephony-based organization. To overcome this challenge, new economic models are needed—models that holistically evaluate the impact that can be delivered to a community and seek the greatest overall benefit, while ensuring each individual economic participant in the ecosystem emerges a winner.
- **Industry structure.** The cornerstone of a modern technology ecosystem is broadband connectivity. Traditionally, this is delivered by service providers, the owners/operators of the network infrastructure. The historical evolution of the telecommunications industry, however, means that service providers cannot always act with the speed and focus required to meet the aims of the community. Monopolistic industry structures, and the high value of the legacy voice business, mean that service providers have a tremendous amount of historical business value to protect—business value that is directly threatened by the emergence of the broadband economy. Therefore, industry structure needs to be changed before the full benefits of connectivity to the community can be delivered.

- **Execution.** A technological infrastructure for a city, region, or country is not built by one player. It is an ecosystem involving hundreds or thousands of economic players who provide a vast range of interoperating services. Competition within this ecosystem drives a process of innovation that, over time, ensures the needs of the community are met to the highest possible levels within the bounds of current technology and economic models. Therefore, if a government unit wishes to influence the development of this ecosystem, a carefully balanced process is required to guide the overall development of the ecosystem while still allowing free reign to the processes of competition and innovation. This process must take account of the interests of all the economic players involved in the creation and delivery of the technology environment, ensuring that each player has the opportunity to benefit.

A Point of View: Delivering Connected Communities

To meet these challenges successfully, governments must develop detailed and specific visions of the services to be delivered by the technology and the benefits those services will bring. They also must apply an operating model that prioritizes the delivery of value to the community, and create and operate an execution vehicle that can orchestrate the process of developing the technology environment, especially the services environment.

Services Vision

The first step in creating a services vision is to develop a detailed understanding of what value is required from the technology by the organizations and individuals that will use them. Although the specific problems that need solutions are unique in each city, region, or country, the value delivered by technology generally applies to three categories:

- Creating new jobs and attracting new businesses
- Boosting industrial performance
- Attracting residents by providing appealing living environments and promoting social inclusion

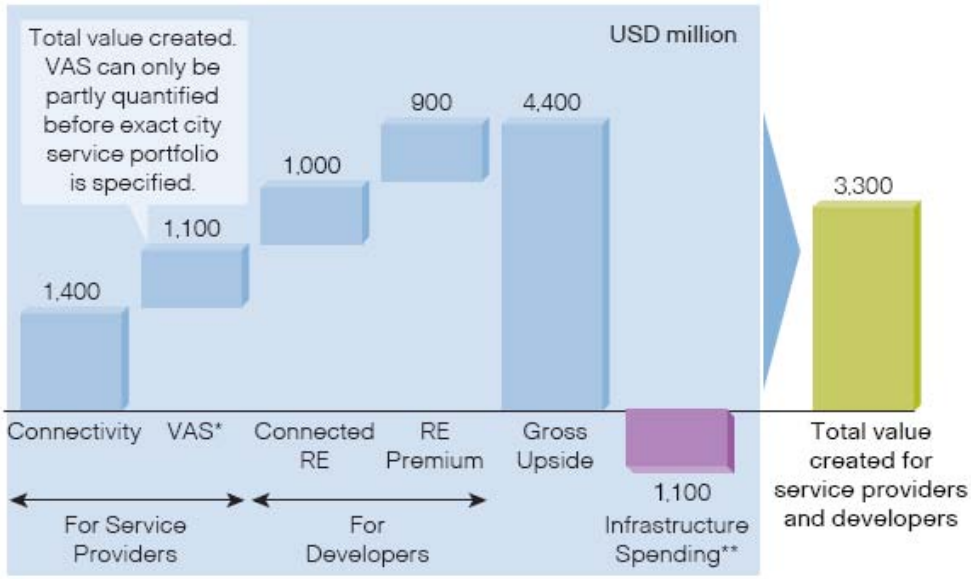
Specific objectives should be defined for each category. The emphasis in this first stage should be placed on the identification of industry sectors, public service sectors, and residential services that can benefit most from technology. This will provide focus for the next stage of creating the services vision.

Once the key target benefits have been defined, a more detailed process of identifying specific, required services can begin. Many services will develop organically through the natural economic processes of competition and innovation; the point is to identify only those services that are critical to achieving the defined economic and social objectives. These are the services that will set the agenda for the government-led orchestration process.

This suite of critical services is known as the Minimum Required Services Set (MRSS). MRSSs are those that the government will prioritize, with the government-sponsored orchestration body taking an active role in encouraging the development of each service, with accelerated time to market and rigorous quality standards.

Although the value of this process to the citizens and organizations of the proposed Connected Community is intuitively clear, many people raise questions about its value to service providers and developers. Viewed in the short term, this model may not always appear to be the best option for these players. But it is the long view that is critical for all involved economic players; in the long term, this model will provide for sustainable and rapid growth of the broadband economy and increase the value of the economic activity taking place within the community.

Figure 1. This sample calculation demonstrates the value created for service providers and developers by implementing a generic "smart city vision" in a hypothetical city of 2 million inhabitants. Note that the actual value delivered to the community is excluded from this calculation.



Source: Cisco IBSG, 2007

* Including only the value created for the service provider. Value created for the consumer is not included.

** Including Capex and recurring Capex investments in passive and active network components.

When populating this model with specific services, it is important to recognize that there is no single MRSS appropriate for any modern city, region, or country. The selection of the MRSS depends on the specific social and economic objectives of the process. Nevertheless, there are some typical examples from successful deployments that show this model can be used in practice:

- **Access services.** Includes basic broadband subscription services, Internet access, and mobility. Services cannot be delivered to individuals and organizations without Internet access.
- **Enabling services.** Back-office services allow other, more sophisticated services to function. They rarely are delivered directly to end customers; rather, they become part of the value proposition of another service. Examples of enabling services include identification, authorization, trust services, and electronic payment.
- **Public services.** Includes network-based applications and systems to support areas such as public safety and security, healthcare, education, and e-government.
- **Industrial services.** Specialized services required by businesses. They usually are defined by sector, according to the specialist requirements that exist in each industry, from financial services and manufacturing to research, petrochemicals, and other sectors. The starting point for defining industrial services is an understanding of the economic vision of the city, region, or country and the industry sectors that will play the most important role in driving economic growth.
- **Residential services.** Includes services such as personal communications, home security, automation, and digital entertainment. These services are designed to improve the lifestyles of residents and to help improve the attractiveness of an area as a center for economic activity. For example, a town where IP telephony services are available will have more to offer its residents than a town that has only basic broadband access.

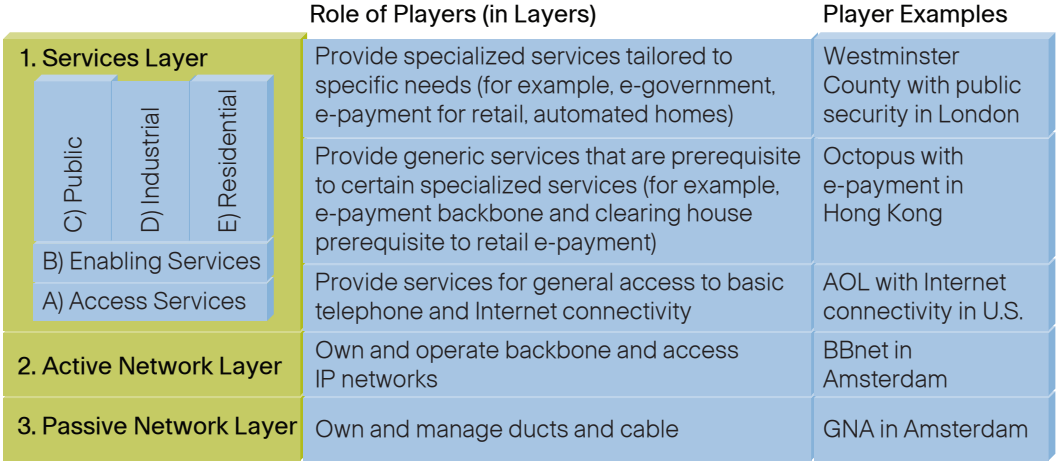
Operating Model

This framework brings a structured approach to the operational, financial, political, and regulatory issues surrounding the Connected Communities initiative. It builds on the services vision by adding a view on how the structure of the telecommunications industry (e.g., the technology ecosystem) should be optimized to maximize delivery of value to the community.

The operating model divides the technology ecosystem into three main layers: passive network, active network, and services.

- Passive networks include the lowest-level physical infrastructure required to enable connectivity: ducts and dark fiber. A passive network alone does nothing; it requires active network components to function.
- An active network includes all the hardware that provides intelligence and functionality to the network, such as routers, switches, and wireless access points or base stations. The active network layer also includes the operation and maintenance of the active network.
- The services layer is divided into five service classes: access, public, industrial, residential, and enabling.

Figure 2. For convenience, the operating model divides the technology environment into three main layers: passive network, active network, and service. Five distinct classes of services also are defined to assist in bringing the services vision to a very specific level.



Source: Cisco IBSG, 2007

Execution Vehicle

Executing on this concept is not a simple task. It requires a government-sponsored body capable of running the orchestration process.

Two major sets of challenges will be encountered in execution:

- **Need to balance influence and openness.** The success of this model depends both on the delivery of a set of clearly defined economic and social objectives and on fully enabling the natural economic processes of competition and innovation. At first glance, these appear to be contradictory requirements, since traditional (heavy-handed), government-influenced processes also tend to create barriers to open competition and innovation. This is why the process we recommend is called "orchestration"—a term intended to signify a central role that coordinates all the players to achieve the best possible overall impact. It also implies a focus on the defined objectives, while allowing full expression for the competitive strategy and innovative potential of all service-layer players.
- **Lack of experience in orchestration.** The orchestration role may be unfamiliar to some government units that still may wish to capture the benefits this approach can deliver. It requires the creation of an orchestration body, a working team that will carry out the orchestration process for passive and active infrastructure and for each MRSS individually. In addition to the orchestration body, a governance model and a well-defined orchestration process are required.

Cisco can provide an orchestration handbook that contains tools and templates designed to facilitate the creation and operation of the orchestration body.

Conclusion

For many nations, technology presents a fast track to global competitiveness. For those nations transitioning from less developed economic models, the Cisco concept of Connected Communities provides an opportunity to gain a rapid advantage over countries with established economies that have to deal with the challenging migration from existing infrastructures to the new technology models. A Connected Communities program provides tailored and proven models for the implementation of an ICT infrastructure that delivers advanced services to individuals and organizations, based on a clear understanding of their requirements. By empowering these stakeholders with the competitive advantage they need, Connected Communities facilitate the cultural and economic changes required to create a Connected Nation—a united, productive, and prosperous country with strong competitive credentials in today's broadband-driven economy.

More Information

The Cisco Internet Business Solutions Group (IBSG), the global strategic consulting arm of Cisco, helps Global Fortune 500 companies and public organizations transform the way they do business—first by designing innovative business processes, and then by integrating advanced technologies into visionary roadmaps that improve customer experience and revenue growth.

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