

# MIT Technology Review



**MinTIC**  
Ministerio de Tecnologías  
de la Información y las Comunicaciones

## Government Policy Report An Initiative of the ICT Ministry of Colombia



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These key icons represent concepts and cross-cutting themes throughout the report



Digital Rights



Connecting Innovation Supply and Demand



MinTIC Academy



Strengthening Universities



Building ICT Talent



Enterprise ICT Training



Developing Regional Ecosystems



Demand Stimulation & Discovery

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# Executive Summary

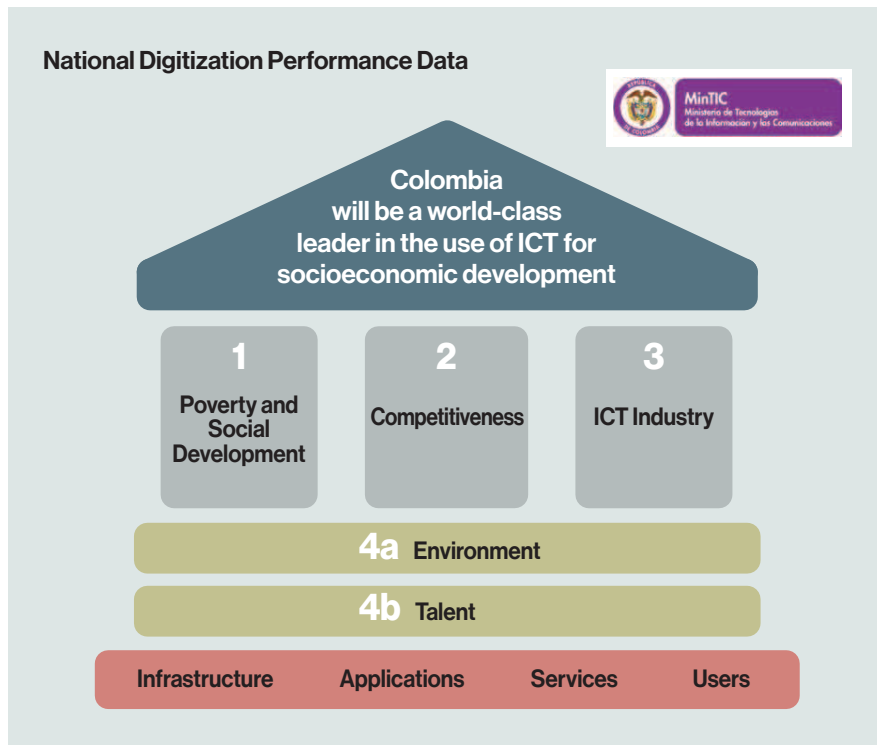
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Since 2010, Colombia's *Vive Digital Plan* has served as a road map for transforming Colombia's ICT landscape and introducing "technology in the life of every Colombian." By most accounts, *Vive Digital* has been a great success, meeting its key objectives for improving ICT access and achieving global accolades for its impacts and innovative programming. Today, nearly every Colombian has the opportunity to use the latest ICTs and to fully participate in life as a digital citizen. When the *Vive Digital* plan was originally unveiled, many Colombians did not understand the potential power of ICT, or else they lacked access to key technologies, such as PCs, tablets, or smartphones. Small pockets of innovation existed, but the average Colombian was not an active user of the Internet and other ICT technologies. As such, *Vive Digital* rightly focused on issues of access, that is, how to ensure that Colombians had access to ICTs and their many benefits.

These access programs have made progress, but we now know that simply ensuring access is not enough. Colombia still faces many challenges in terms of ICT deployment and use. Homegrown ICT capacities are fairly limited and the local industry is dominated by foreign multinationals and a tiny base of local small and medium-size enterprises (SMEs). Many SMEs have limited access to the Internet or other ICT tools. ICT-focused firms lack resources and capacity to develop new innovations or compete in global markets. A strong ICT innovation ecosystem does not yet exist and new firms lack access to skilled business service providers or to effective partners in universities, local governments, or key national agencies. Finally, and perhaps most important, Colombia, like many other countries, suffers from a dearth of ICT talent across the board, from entry-level programmers, to engineers and technicians, to skilled managers to ICT-savvy leaders in the private, non-profit, and public sectors.

These new ICT investments and initiatives should not be limited to ICT-related industries alone. Under *Vive Digital*, important progress in addressing wider societal challenges has been made. Yet continued efforts to deploy ICT in ways that help combat poverty, create jobs, and spur competitiveness are still needed. ICT and related technologies can and should have important impacts on improving productivity and spurring innovation across the Colombian economy.

The next version of *Vive Digital*—*Vive Digital 2*—seeks to address these pressing challenges. It is time to move beyond ensuring access to ICT. Now, the focus moves to deeper engagement with ICT—to use ICT as a way to improve lives, enhance competitiveness, open new markets, build wealth, and strengthen communities.



This report presents potential strategies, initiatives, and programs to be considered as part of MinTIC's Vive Digital 2 Strategy. The recommendations build on the original Vive Digital framework, but move beyond to identify how ICT can help address other challenges and pressures facing Colombian society and the wider economy. The report addresses four primary focus areas:

1. **Poverty Alleviation and Social Development:** How can ICT help to reduce poverty in Colombia and to promote other important social development goals, such as improved health and education outcomes?
2. **Competitiveness:** How can ICT help foster a more competitive and innovative Colombian economy?
3. **ICT Industry:** How can the plan help create a stronger Colombian ICT sector that contributes to added value to the economy?
4. **Environment and Talent:** What underlying conditions, in areas like infrastructure, regulation, talent development, and the business environment, are required to support a thriving ICT-based economy?





These focus areas encompass a broad range of issues and policy challenges. Thus, this policy report touches on dozens of issue areas and includes a large number and diverse assemblage of

policy ideas and recommendations. Its recommendations are organized in two ways—by focus and/or framework area, and by whether they are core recommendations or of a supporting nature. Core recommendations, which require significant investment or significant changes to current policies and programs, are considered top priorities for the Vive Digital 2 Strategy. Supporting recommendations tend to be more modest in scale and scope. They may require simply the continuation of current programs, or minor adjustments to current policy, or small-scale investments targeted to more specific and focused policy goals.

## Framework Area 1: ICT and Poverty Alleviation/ Social Development






MinTIC's leading vision for Vive Digital 2 entails "massifying the Internet." In other words, MinTIC is seeking to support tools, programs, and investments that help every Colombian access the latest and most up-to-date ICT technologies and services. This new ICT access can help transform lives, by bringing innovations in education, health care, justice reform, poverty alleviation, and economic development to all parts of Colombia and to all Colombians.

The Vive Digital 2 Program should embrace the following initiatives, which are all designed to use ICT as a means to improve the health, education, and quality of life for all Colombians. The four items should all be priority action items in Vive Digital 2.

1. Develop a Digital Rights Package for All Colombians. These digital rights should ensure that every citizen has access to digital hardware and to key services, along with control over their personal electronic health and identity records. 
2. Build New Training Platforms: Charter MinTIC Academy, Colombia's first fully online education and training platform. This effort will help position Colombia as a world leader in Spanish-language online education.   
3. Promote E-Health: Support creation of a nationwide e-health strategy in cooperation with other national ministries; appoint a MinTIC ambassador for e-health to help promote and support this effort.
4. Provide Deeper Access: Deploy dedicated wireless access points in every community in Colombia. This effort should be accompanied with support for smartphone purchases and with MinTIC's sponsorship of "app stores" that host useful mobile apps, tools, and services.

## Framework Area 2: Competitiveness

Empowering all Colombians via ICT will help improve lives and promote economic development. A new push to enhance national and regional competitiveness via ICT is also needed. Today, the limited penetration of state-of-the-art ICT in Colombian businesses, especially in SMEs, is a major impediment to economic growth. Industry competitiveness can be enhanced via ICTs in many ways, including:

1. **Adopt a National E-Agriculture Strategy:** Colombia's agriculture sectors are global industry leaders and major employers across the country. Efforts to improve the productivity of Colombian agriculture via ICT-innovation investments can have large ripple effects across the economy. MinTIC should develop new initiatives, in partnership with the ICT and agribusiness sectors, to provide ICT training, facilitate creation of sector-specific apps, develop information content, and identify market potential for advanced ICT-agribusiness products or services that could be developed within Colombia.  
2. **Build ICT Capacity among SMEs:** Encourage SMEs in all sectors to embrace the active use of ICT tools and technologies, via actions such as:  
  - Offering ICT training, education and funding to deepen the ICT capability of SMEs that already use basic technology tools
  - Creating MinTIC-approved training and content to upgrade digital skills and encourage utilization to deepen the ICT capability of SMEs
  - Providing vouchers to subsidize purchase of ICT products and services 
  - Developing applications that help SMEs to improve the efficiency and productivity of their supply chains.
3. **Embrace E-Government:** Formalize MinTIC as the lead organization for e-government initiatives at the national level in order to:
  - achieve a "whole-of-government" approach and management of a single portal for citizen services and
  - develop a long-term technology road map and build political support to address evolving ICT issues in government.

This effort should include the establishment of a new regional center of ICT innovation for e-government to serve as a national thought leader on effective e-government strategies.

4. **Embrace Open Source:** Adopt a positive and proactive policy towards development, use, and sharing of open source software and related code that would apply to all government levels, public health and higher education institutions.

## Framework Area 3: ICT & Industry

Developing a more competitive, resilient, and innovative homegrown ICT sector is a primary goal of MinTIC and other key players supporting the development of Colombia's innovation and entrepreneurship-focused ecosystems. MinTIC and its partners have already initiated several important new efforts focused on strengthening Colombia's innovation ecosystem. These include efforts such as the Apps.co program and the recently-released Strategic Vision of the Software and Associated Services Sector. This section presents additional ideas for enhancing the competitiveness of Colombia's emerging ICT sector. Specific suggested initiatives include the following:



1. Build regional ecosystems by investing in several initiatives that strengthen regional ICT clusters and related industries. These initiatives include: 
  - Regional centers of ICT innovation that build connections between ICT and key regional industry clusters, with a particular focus on anchor companies 
  - University entrepreneurship and innovation centers that strengthen university capacities to train future entrepreneurs, to commercialize technology, and to nurture regional innovation ecosystems 
  - Proof-of-concept centers: a small number of centers focused exclusively on the commercialization of university-developed technology. 
2. Support ICT-focused innovation investments at SMEs. This fund could be structured in several ways—as a pool of grant funds, as a challenge prize competition, or as an innovation voucher program where firms could use publicly backed vouchers to purchase services or tools on the open market.

## Framework Area 4: Environment: Talent & Institutions

Framework Area 4 of the Vive Digital II strategy includes two major components: talent and institutions. The dearth of ICT talent, which ranges from entry-level programmers to engineers and technicians to skilled managers and ICT-savvy leaders in the private, nonprofit, and public sectors, has been identified as a barrier to achieving a digital culture and maximizing the opportunities ICT presents for overall economic competitiveness. MinTIC has organized its efforts to improve the quantity and quality of ICT technical skills and competencies around three categories: society, ICT professionals (industry and universities), and policy makers. These efforts require close partnerships with different kinds of institutions, such as national, regional and local government organizations, universities, and leading industry partners. Specific recommendations in the areas of talent and institutions include the following:

1. **Build ICT Talent at all Levels: Scale MinTIC's ICT talent initiatives to a massive level through a MinTIC-approved digital badging program that will be accessible to all Colombians—not just ICT professionals—and will be aimed at developing basic and advanced ICT technical skills, using the proposed MinTIC Academy as the main platform.**  
2. **Serve Key Industry Needs: Create a program that can provide customized training for firms with demonstrated demand for workers needing ICT technical skills, working in partnership with SENA (the national apprenticeship service), ICETEX (the technical education institute, universities, or other qualified training providers.** 
3. **Groom ICT-Savvy Public Servants: Increase understanding of ICT policy issues among elected officials at all government levels by offering nontechnical, big-picture events that address ICT topics, built around popular speakers, private sector leaders, networking, and social activities.** 
4. **Enhance C-Level Management and ICT Expertise: Create and convene groups of government and private sector CIOs for education, leadership, and program management training to improve their ability to implement ICT solutions at the regional and municipal levels.** 



<b>Matrix of Recommendations/Institutional Approach</b>				
<b>MinTIC Policy Lead</b>	<b>MinTIC Programs</b>	<b>MinTIC Lab</b>	<b>“Seat at the Table”</b>	<b>Building the Academia-Government-Industry Links</b>
MinTIC is the national leader to craft policies that will affect all Colombians and all government agencies.	MinTIC creates, finances, and manages these programs internally; they do not require external partnerships to implement.	MinTIC initiatives for which MinTIC must work through partners, are outward-facing, and require external resources or agreements to achieve objectives.	Other organizations (including other central government ministries) already have primary responsibility for achieving the socioeconomic objectives related to these recommendations, but MinTIC brings ICT to the table to improve their outcomes.	MinTIC facilitates and/or brokers these relationships that are created in the service of broader ICT and socioeconomic development objectives.
 <b>Core Recommendations</b>				
Digital rights for citizens (1) Lead organization for e-government at national level (2) Open source policy (2)	Wireless access points and apps store (1) ICT innovation investments or vouchers for SMEs (2,3)	MinTIC Academy (1); ICT for SMEs (2); digital badges (4); events for politicians (4); teacher-counselor training (1,4); ICT for Government curriculum (4) Regional center of ICT innovation of e-government (4)	E-health strategy (1) ICT for Agribusiness (2)	Regional centers of ICT innovation (3) University entrepreneurship and innovation centers (3) Proof-of-concept centers (3) Customized ICT training for companies/strategic sectors (4) CIO council (4) Product design centers (4)
 <b>Supporting Recommendations</b>				
Data privacy policy (2) Open data policy (2) ICT purchases to favor Colombian firms (3)	Tablet program for students (1)	Smart cities policy (2) Entrepreneur in residence (3)	Potential for mobile banking (1) ICT for logistics summit (2) Regional ICT strategy implementation (2)	Outreach: TEDx, civic hacking (1) Prize for e-education/entrepreneurship (1) Open data communities of practice (2) Investor networks (3)

(Framework areas are noted in parentheses)