

RESEARCH INSIGHTS



How to Identify Affordable High-Impact Digital Solutions for Public Services?



Digital projects in education, healthcare, and administrative services displayed net present values and low implementation costs, but wide variation was found in net benefits across policy options



A fully digital solution is not always the best option for balancing costs and benefits. Adequate integration of digital and human inputs is often necessary.



Since digital applications feature low or negligible marginal cost, scale is critical in producing large social net benefits.

CONTEXT

In Latin America and the Caribbean, during the last decade, consumer access to and use of digital technology, particularly through smartphones, has increased markedly. Nonetheless, governments in the region have limited resources for projects that can harness the new digital channels to provide public services. As many digital public services can both expand access to services and be implemented at a lower cost, governments have a range of opportunities to improve public service delivery through digitalization. The availability of digital solutions with high benefits and low costs (low-hanging fruit) provides a strong motivation for governments to improve the efficiency and quality of public services.

PROJECT

The research team produced cost-benefit analyses that identify policies with high net benefits (expected net present value) and low implementation costs. We used common assumptions and a standardized methodology to increase the comparability of the results across types of digital public services. The sectors considered were education, health, and government administrative services. The costs and benefits of digital projects in each sector were estimated for a time-frame of one or two years. A total of 11 projects were assessed, and data for Peru are presented as being representative of the countries and projects considered.

Key Concept



DIGITAL PUBLIC SERVICES

The use of digital technologies to provide publicly funded services to citizens at local, regional, and national levels.

Key Concept



COST-BENEFIT ANALYSIS

The cost-benefit analyst sums the potential rewards expected from a situation or action and then subtracts the total costs associated with taking that action.

RESULTS

In Peru's education sector, digital programs have positive net present values significantly higher than their implementation costs. In one year, for instance, a policy to reduce dropout rates through informational-motivational videos delivered in classrooms has a net present value of US\$553.04 million with an implementation cost of only US\$1.09 million. Another project that consisted of student practice using a math app had a net present value of US\$32.29 million (US\$1.22 million implementation costs) when teachers are trained to use the new technology through workshops, US\$96.71 million (US\$3.78 million implementation costs) when teachers are trained by coaches. Higher values, though with higher costs, result if updating school infrastructure is needed (see [Figure](#)).

Net present values are also positive and outweigh implementation costs of digital projects in Peru's health sector. In a program using different modalities to provide guided internet-based cognitive behavioral therapy (iCBT) had the highest net present value at US\$38.69 million, followed by telephone CBT at US\$16.25 million, and a face-to-face modality where the patient talked with a human therapist at US\$15.27 million. In addition, a one-year SMS (texting) intervention offering information and reminders for prediabetic patients had a net present value is US\$5.51 million, with US\$250,000 implementation cost when take-up is 50%.

Digital solutions in government transactional services display particularly low implementation costs. An intervention to promote ID card renewal was estimated to have a net present value of US\$6.85 million using only SMS reminders, US\$4.08 million when SMS is combined with a link to an online platform to begin the renewal application, and US\$7.11 million when SMS is combined with a user-optimized online platform. All three policies had implementation costs of US\$120,000 each. Finally, a biometric identification intervention has net present value of US\$7.11 million (US\$1.23 million implementation cost).

Qualitatively similar results were found for Chile, El Salvador, and Jamaica.

POLICY IMPLICATIONS

Although the policy options analyzed produced positive net present values with low implementation costs, there is wide variation in net present value across policy options. This suggests that governments should carefully evaluate which digital public services to prioritize for implementation. In terms of the specific design, a guiding principle is to exploit the comparative advantages of technology and people for specific tasks (technology for routine tasks, people for more complex and varied tasks). It is important to experiment and test different solutions to find the right human-tech mix in specific applications. Software is key in digital projects and hence resources should be devoted to ensuring that software works reliably, and users find applications easy to use. This is particularly relevant for software intended for a broad audience, since an intuitive and easy-to-use application reduces the barriers to widespread adoption, especially among populations with low digital skill levels.

There has been a rapid increase in smartphone adoption, especially by low-income populations, among whom access to cell phones was already high. Therefore, focusing on digital projects that depends on access to these devices could help ensure that large segments of the population benefit from the services provided. This strategy has to be coupled with an explicit effort to promote adoption among disadvantaged populations to ensure that digital projects also increase equity. Finally, it is critical to promote the use of digital applications that can be optimized by running iterative, continuous experiments, exploiting the rich data generated by applications, and drawing from insights from behavioral economics, machine learning, and digital communication.

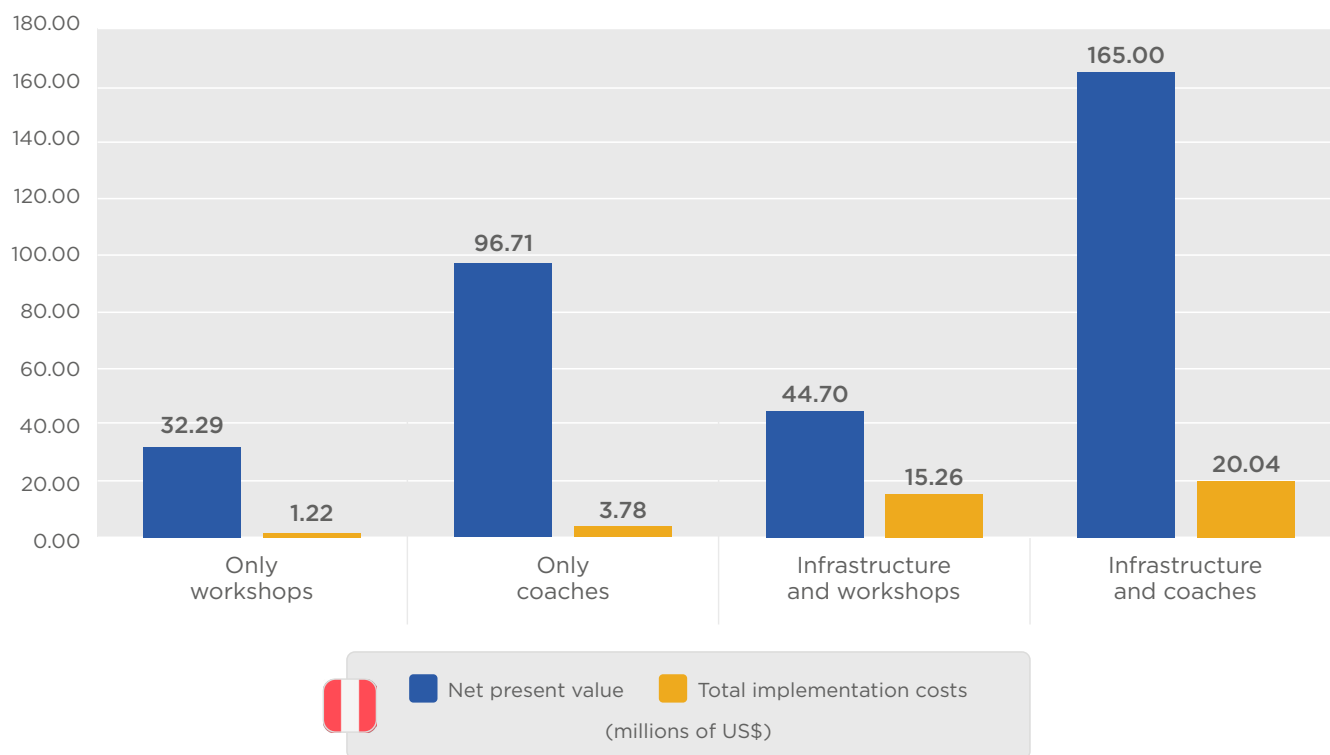
Key Concept



COGNITIVE BEHAVIORAL THERAPY

A type of psychotherapy in which negative patterns of thought are challenged in order to alter unwanted behavior patterns or treat mood disorders such as depression.

Figure 1. Net Benefits vs. Total Implementation Costs



Note: The figure shows the cost-benefits results from a one-year implementation of a math app in Peruvian public schools.

IDB RESEARCH ON DIGITAL PUBLIC SERVICES

This document is part of a series on digital public services undertaken by the IDB Research Department along with the Education Division, the Social Protection and Health Division, Innovations for Citizen Services Division, and Fiscal and Municipal Management Division.



FULL STUDY

[Cristia, Julian P., Pedro Bernal, Julieth Santamaria, Paula Algarra, Carolina Bernal, Liseth Escalante, Andrés Gallegos, et al. 2022. "A Cost-Benefit Analysis of Selected Digital Projects in Latin America and the Caribbean." IDB Technical Note No. 2585. Washington, DC: Inter-American Development Bank.](#)

This research also informed the 2022 Latin American and Caribbean Microeconomic Report, [Digitalizing Public Services: Opportunities for Latin America and the Caribbean.](#)

DEPARTMENT OF RESEARCH AND CHIEF ECONOMIST

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