



ADVOCACY
ASSEMBLY

Measuring the Economic Costs of Internet Shutdowns

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I. Background

This toolkit is a practical guide for measuring economic losses across diverse sectors caused by internet shutdowns. It facilitates access to some tools, provides an insight into the methodologies they use and highlights their main features and limitations.

Today, an estimated 67% of the world's population are able to connect to the internet, doubling the number of people connected only 10 years ago. This is the reality of the present day, where the internet plays a pivotal role in our lives and economies. From its ability to transcend physical boundaries, facilitating international trade and remote work, to its direct impact on income generation for millions through online platforms, the digital economy represents a powerful force for economic activities. According to WTO estimates, digitally delivered services have recorded an increase of 8.1% on average per year from 2005 to 2022, to account for 54% of total service exports. Additionally, the internet is a growing source of direct income for millions. Online gig work is accounting in 2024 for up to 12% of the global labour force, which translates into over 400 million online gig workers around the world.

However, a paradox emerges. Despite its undeniable economic importance, the very fabric of this digital world faces a critical threat: internet shutdowns. In 2022 alone, governments and other actors disrupted the internet at least 187 times across 35 countries, impacting millions.

Within this toolkit, you'll find a practical guide to assessing economic losses caused by shutdowns.

II. Estimating Economic Costs of Internet Shutdowns

A. Overview of Economic Impacts

Internet disruptions directly and indirectly affect economic activities, from day-to-day business transactions to access to new markets and investment flow. A [study](#) in 2016 found that the magnitude of the impacts of network disruptions vary by the means, length, and targeting of the disruption as well as a country's existing levels of internet connectivity. In dollar terms, internet shutdowns cost the world economy \$9.01 billion in 2023, with 747 million people affected according to the “annual [report](#) on the cost of internet shutdowns” by Top10VPN.

Besides its direct contributions to GDP, the internet is also a strong catalyst of economic competitiveness, playing a crucial role in facilitating communications, overcoming bureaucracies, speeding transactions and accessing wider markets. For individuals, its disruption may translate to lost productivity – deadlines missed, tasks incomplete, and loss of income. Businesses face a similar picture – lost revenue, uncertainty, and damaged customer relationships. For example, blocking specific services like social media, instant messaging, or search engines has both immediate and long-term impacts. Such disruptions may delay communications as well as lower brand visibility with customers, and opportunities to engage with them. A regional shutdown on the other hand can lead to supply shortages of specialised products if the targeted regions contain specialised industries and sectors. A long disruption can further increase uncertainty in the business environment and discourage investors, hindering economic growth and innovation.

Having established an understanding of the devastating economic impact of internet shutdowns, the next crucial step is equipping ourselves with the tools and resources to estimate and report on these losses.

B. Tools and resources

In this section, we will explore tools and resources to estimate and monitor the economic impacts of network disruptions. These tools serve a diverse spectrum of users, from journalists and researchers seeking data for impactful reporting to advocates and policymakers requiring evidence to inform their decisions. By quantifying the financial losses, these tools paint a tangible picture of the cost of internet disruptions. This data empowers journalists to craft evidence-based narratives, strengthens advocacy efforts by highlighting the tangible economic consequences, and informs policy decisions by demonstrating the potential harm internet restrictions can inflict. Businesses, too, benefit from understanding the potential losses associated with shutdowns, allowing them to plan and mitigate risk. Ultimately, these estimation and tracking tools serve as essential instruments in the battle to safeguard internet access and its inherent economic value for all.

COST: The NetBlocks Cost of Shutdown Tool

The **Cost of Shutdown Tool (COST)** is a data-driven online service that empowers individuals and organisations to generate rough estimates of the economic cost associated with various internet disruptions. It is a project implemented by **Netblocks**, a global internet monitor working at the intersection of digital rights, cybersecurity and internet governance.

Methodology:

The NetBlocks Cost of Shutdown Tool builds upon established methodologies developed by institutions like the Brookings Institution and the Collaboration on International ICT Policy for East and Southern Africa (CIPESA).

The method introduced in a **2016 Brookings Institution report** on the cost of shutdowns focuses on assessing the impact of short-term internet shutdowns on a country's Gross Domestic Product (GDP). This approach analyses data from 81 real-world shutdown events, considering factors like duration, affected population percentage, and national GDP. Additionally, it incorporates mobile subscription rates to gauge the importance of mobile networks in each affected nation. Utilising specific formulas tailored to different types of shutdowns (national internet, subnational mobile, etc.), the Brookings method delivers estimates of the GDP impact associated

with each disruption. However, it is important to acknowledge that this approach has limitations. Firstly, it solely focuses on GDP impact, neglecting other potential economic costs such as lost tax revenues, decreased worker productivity, or impact on business expansion. Secondly, its reliance on static 2014 GDP data potentially limits its accuracy for more recent events.

The second framework referenced by the netblocks cost of shutdown tool is the framework for calculating the economic impact of internet disruptions in sub-Saharan Africa: The "**Framework for Estimating the Economic Impact of Internet Disruptions in Sub-Saharan Africa**" developed by CIPESA specifically targets the estimation of economic costs associated with internet shutdowns in Sub-Saharan African countries.

Focusing on two key disruption categories - total national shutdowns and targeted app/service disruptions - the framework estimates the economic impact through three steps:

1. Direct GDP Loss: First, it uses the internet sector's contribution to national GDP and the duration of the disruption to estimate the immediate economic impact.

2. Indirect Costs: This step goes beyond immediate impact by incorporating qualitative and quantitative aspects like loss of investor confidence, reputational risk, and business disruptions due to offline operations. Estimations and analysis of offline businesses and potential efficiency gains lost from digitisation contribute to this calculation.

3. Country Risk Profile: The framework acknowledges the impact of disruptions on a country's risk profile and cost of capital. By considering factors like risk-free rate, market conditions, and a "disruption markup," this step aims to capture the broader economic consequences of internet disruptions.

The framework showcases its flexibility by accommodating calculations for various scenarios, including regional disruptions and different shutdown types. However, it also acknowledges limitations such as the complexity of calculating regional impacts and the reliance on estimations for indirect costs due to limited evidence. For app/service-specific shutdowns, the framework adapts the formula to include the contribution of the targeted application or service to the internet economy.

Data Sources:

The **NetBlocks Cost of Shutdown Tool (COST)** leverages public economic indicators from the World Bank, ITU, Eurostat, and the U.S. Census to assess the potential economic impact of shutdowns.

Key Features:

COST stands out for its ability to assess the economic impact of various internet disruptions. It tackles broad scenarios, including complete internet shutdowns, targeted mobile data blackouts, and specific social media restrictions. The user-friendly interface makes selecting the disruption type, location, duration, and affected services easy, tailoring the analysis to specific needs. The methodology adheres to published frameworks to ensure transparency and replicability, fostering trust and encouraging further analysis.

Limitations:

While COST offers valuable insights, it's crucial to acknowledge its limitations. Due to the inherent complexities of quantifying economic impacts, the estimates generated are rough approximations and may not capture the full extent of the true economic impact. Additionally, the tool currently relies on 2020 economic data, which could limit its accuracy for analysing more recent events. Furthermore, COST primarily focuses on national-level disruptions, lacking the capability to provide subnational estimates. This necessitates caution when using it to analyse countries with frequent regional internet shutdowns. By understanding these limitations, users can interpret COST's results with informed awareness and make data-driven decisions accordingly.

The NetLoss Calculator

Hosted on the **Internet Society's Pulse Platform** that tracks and analyses shutdowns, the **NetLoss Calculator** is a tool designed to estimate the economic impact of internet shutdowns. It goes beyond traditional Gross Domestic Product (GDP) analysis, offering a wider and more nuanced understanding of the economic consequences these disruptions can have. The calculator considers factors such as the change in unemployment rate and the amount of foreign direct investment that may be lost.

Additionally, it also factors in the risk of future shutdowns, providing valuable insights into the probability of a country experiencing a shutdown.

Methodology:

The NetLoss Calculator utilises an **econometric framework**, allowing it to examine the specific mechanisms through which internet shutdowns affect various economic, social, and other relevant outcomes. This enables a more thorough analysis compared to solely relying on GDP changes.

The employed framework leverages a two-step approach. First, it estimates the likelihood and duration of such disruptions by analysing historical data like global economic indicators, political trends, and upcoming events. This lays the groundwork for impact assessment. In the second stage, an econometric model translates these disruptions into quantifiable economic losses by factoring in the predicted shutdown characteristics (type, duration), prevailing economic conditions (GDP, inflation, foreign investment), and sectoral sensitivities (agriculture, finance).

Data Sources:

The NetLoss Calculator leverages publicly available datasets for transparency and reproducibility. Data sources include:

- **Internet Society Pulse** shutdowns tracker: Detailed event-level data on government-mandated shutdown events and their classification as either national or regional shutdowns or service blocking.(starting 2019).
- **Armed Conflict Location & Event Data Project** (ACLED): Data on various events classified as battles, protests, riots, strategic development, or violence against civilians since 2016.
- **Constituency-Level Elections Archive** (CLEA): Election data maintained by Yale University for more than 150 countries at the month-year level since 1960.
- Socioeconomic indicators from the World Bank: Socioeconomic indicators like GDP, employment, inflation, and foreign investment.

Key Features:

The calculator offers the user the possibility to personalise the analysis. Users can select the specific country of interest, indicate the dates of the shutdown, and even choose its type: a complete internet blackout or a targeted service block.

Overall, the NetLoss Calculator offers a comprehensive understanding of internet shutdowns' economic impact that goes beyond simple metrics like GDP. This comprehensive approach incorporates dimensions like employment, inflation, foreign investment, and even social factors, providing a wider scope of the economic fallout. Further enhancing its transparency, the calculator utilises publicly available data, making its methodology reproducible for verification and further analysis. This combination of features empowers the NetLoss Calculator to provide valuable insights into the multifaceted economic consequences of internet disruptions.

Limitations:

It's important to note that this calculator currently doesn't differentiate between national and regional shutdowns. This necessitates caution when analysing situations where regional internet disruptions are frequent.

The Cost of Internet Shutdowns Tracker

The [Global Cost of Internet Shutdowns annual report](#) provides a comprehensible resource detailing the total economic impact of every major deliberate internet outage and social media shutdown around the world. This report includes documented government ordered internet blackouts, social media shutdowns and severe ISP throttling in a given year. The nature, duration, and severity of each outage are based on data and reports by [Netblocks](#), independent trackers like [IODA](#) and [SFLC.IN](#), and [OONI's](#) censorship measurement tools. Economic costs are then calculated using the Netblocks Cost of Shutdown Tool, which builds upon the Brookings Institution method and CIPESA's specialised model for Sub-Saharan African countries. Regional shutdown costs are derived from the region's economic output as a proportion of national GDP. Furthermore, the report's methodology captures the complexities of partial outages by calculating their proportional impact based on up-to-date internet market share data for the affected country. Notably, for social media shutdowns, the report considers the total number of internet users in the affected location, rather than platform-specific user numbers, reflecting the broader impact on overall internet access regardless of individual platform usage. Through this robust and data-driven approach, the report offers a clear and quantifiable understanding of the economic consequences of internet shutdowns, empowering informed decision-making and advocacy campaigns.

According to the report, in 2023, the economic consequences of government-enforced internet shutdowns reached \$9.01 billion. Notably, social media platforms were the most frequent targets, with Twitter leading the pack in terms of blocked hours. The report also includes easy to navigate data tables showing the total economic cost of all major internet shutdowns in 2023 grouped by context, countries and regions.

C. Challenges in Estimating Costs

Quantifying the economic impact of internet shutdowns remains a challenge, despite strong efforts to shed light on this critical issue. The scarcity of research and limited publications examining the economic consequences present the initial hurdle. Unlike other economic events, shutdowns often lack readily available data and clear cause-and-effect relationships, making robust analysis difficult. Further compounding this issue is the persistence of economic costs beyond the immediate disruption period. The economic ramifications of shutdowns can extend far beyond the immediate disruption creating multifaceted interconnected losses that current methodologies struggle to capture.

Additionally, informal sectors and context-specific nuances add another layer of complexity. Established cost estimation frameworks often rely on parameters like average connection speed or e-commerce penetration, which may not accurately reflect the realities of informal economies heavily reliant on mobile internet, mobile money, and communication applications. For instance, in many developing countries, a significant portion of the informal sector leverages mobile communication for job opportunities and work-related activities, making the impact of shutdowns far more substantial than traditional metrics capture.

Enhanced research efforts are needed, focusing on methodologies that capture shutdowns' multifaceted and often indirect economic consequences. Context-specific data collection is crucial, moving beyond traditional metrics and delving into the unique realities of informal economies and their reliance on digital tools. This demands collaboration between researchers, policymakers, and internet stakeholders to develop robust frameworks and data collection strategies, ultimately ensuring a wider understanding of the true costs associated with internet disruptions.

III. Tracking Internet Shutdowns

A. Importance of Real-Time Monitoring

Real-time monitoring and tracking of internet shutdowns are essential for quantifying harm, promoting transparency, and mitigating disruptions. By meticulously documenting the nature, duration, and severity of shutdowns, organisations can accurately estimate their economic costs and empower informed decision-making and advocacy efforts.

Ultimately, both real-time tracking and thorough cost documentation work hand-in-hand. Together, they provide a comprehensive picture of the human and economic cost of internet shutdowns. Additionally, timely detection of shutdowns allows for proactive measures like deploying circumvention tools and informing affected communities, potentially mitigating their impact and reducing related losses.

B. Tools for Tracking Shutdowns

Several organisations dedicate their work to meticulously monitoring and documenting internet shutdowns across the globe. Their efforts play a crucial role in exposing these disruptions and advocating for the fundamental right to an open internet. In this section, we will be listing some key players, tools and platforms for tracking shutdowns and network disruptions:

- **Internet Outage Detection and Analysis (IODA) platform:** IODA serves as an online platform that monitors internet infrastructure connectivity to identify outages. It helps the Internet freedom community and Internet users globally to verify a disruption in Internet connectivity and understand the extent of disconnectivity of location and duration. In the Advocacy Assembly course “**Detecting Internet Shutdowns with IODA**”, you can learn how IODA measures Internet outages and how to use the IODA dashboard to monitor for outages or look for historic outages.



- **Global internet shutdowns:** Maintained by the Internet Society, this platform serves as a valuable resource for journalists, researchers, and the public alike. It presents a global map of ongoing and recent internet shutdowns, offering brief summaries of each incident, including the reasons for the outage and the affected regions.
- **Cloudflare Radar:** With easily accessible reports and data, Cloudflare radar is an online hub that showcases global Internet traffic, attack, and technology insights. It is powered by data from the global network of Cloudflare, a technology company that provides content delivery network services among others.
- **Shutdown Tracker Optimization Project (STOP) by Access Now:** It is an updated list of internet shutdowns and provides information on the scope, magnitude, and context of these events
- **Internet Shutdown Tracker by SFLC.in:** This tracker keeps a watchful eye on internet disruptions within India, providing detailed information on both nationwide and regional shutdowns.

IV. Stories of Impact

While statistics and reports offer valuable insights into the economic and societal impact of internet shutdowns, sharing stories of impact and experiences allows to reveal the lived realities of individuals and communities. These stories can showcase the diverse ways internet shutdowns affect economic livelihoods, from disrupting business opportunities to hindering access to financial services etc. Furthermore, sharing personal narratives can foster empathy and go beyond numbers to resonate deeply and drive actions.

Reach out to local news outlets, civil society groups, and digital rights organisations to learn firsthand about the effects on impacted communities. For example, Access Now's [Shutdown Stories project](#) crowdsources stories on how internet blackouts are making it extremely hard for people to sustain their livelihoods. If you have ever been a victim of an internet shutdown, you can also submit your testimony through this [form](#).

V. Case Study: Senegal

Following the sudden postponement of the presidential elections on February 3, 2024, the Senegalese government imposed a mobile internet shutdown amid widespread protests. The Ministry of Communications, Telecommunications and Digital Economy issued a [statement](#) confirming the suspension of mobile data internet under the pretext of curbing the spread of “hateful and subversive messages” on social media. The shutdown that started on February 4th, 10 pm, lasted for around two days, as per data from [Netblocks](#) and [Cloudflare Radar](#).

While the discussed shutdown concerned only mobile data, it is important to note that mobile internet users in Senegal represented the largest user share (96.52%) according to the telecommunications and postal regulatory authority's latest [reports](#).

According to the [netblocks](#) cost of shutdown tool, one day of a total internet shutdown causes an estimated loss of more than 4.8 billion CFA francs (about \$7.9 million).



In terms of GDP (PPP)- gross domestic product based on purchasing power parity-loss for one day of internet outage, the **Netloss calculator** estimates it to exceed 100 million CFA francs.

This marks the fourth time Senegalese authorities **ordered** an internet shutdown between 2021 and 2024. In 2023 alone, the total cost of internet restrictions **reached** \$57.4 million, according to Top10vpn's global cost of internet shutdowns annual report.

VI. Additional Resources

→ **"Advocating & Campaigning Against Internet Shutdowns"**

course

→ **"Engaging with the Private Sector to End Internet Shutdowns"**

course

→ **"The Economic Impact of Disruptions to Internet Connectivity"**

Report

→ **KeptOn Campaign**: Fighting Internet shutdowns around the

world

→ **Pakistan Elections 2024: The Unexpected Cost of Mobile Service Disruptions**