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Return-on-Investment in National Digital Transformation:

Exploring the Development Impact of Digital

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Digital transformation is often measured in the context of systems and subscribers—for example, increases in 4G mobile coverage, numbers of active users and the value of financial investment in hardware and software. This results in digital being seen solely through the lens of solutions and not outcomes. This brief highlights the importance of broadening our measurement of digital transformation: 'return-on-investment in digital transformation' (RoI-DT) aims to position digital approaches as key to achieving development outcomes. This includes the role of digital in reducing poverty, improving equality and protecting the planet. By broadening the definition of impact and return-on-investment, the development community can better integrate digital as a key human development enabler—and one that should no longer be solely the responsibility of digital, technical or IT teams and experts.

Digital transformation is increasingly being seen as an important driver[2] for human development.[3–4] Since the COVID-19 pandemic forced the acceleration, exploration and implementation of digital around the world, many countries have proactively explored the role and potential of digital for their national and local development.[5] As the world locked down, public and private services—including social protection payments, education and healthcare—went online. Governments with existing digital foundations and processes (including digital identity and payment components) were better positioned to reach and support their citizens than countries without these assets.[6]

However, digital transformation is a complex and sometimes costly journey that requires significant investment in skills, culture and technology. These investments can also take many years to demonstrate a return-on-investment. And the direction may not always be positive. Digital technologies can introduce new risks and exacerbate existing harms,[7] including mis- and disinformation, cyber threats, technology-facilitated violence and environmental impact. In addition, some outcomes of digital investment, whether positive or negative, may be difficult to directly attribute. To date, significant attention has been given to the financial or economic return-on-investment of digital. There is a need to broaden this definition, particularly recognizing the complexity, ambiguity and non-linearity of national digital transformation.

Why we need to measure return-on-investment of digital transformation

Although measuring the impact of national digital transformation can be complicated,[8] it is a crucial component of shaping a whole-of-society approach to digital transformation. The right measurement of the return-on investment could enable:

- **More effective and better targeted digital interventions:** understanding of what is and isn't working; ensuring that no one is left behind and that digital has an impact where it is needed most—including supporting those who are usually at risk of being excluded.[9]
- **Better and evidence-based decision-making:** equipping policymakers and development professionals with data and practical insights that they need for broader development interventions to drive and further the digital agenda; making intentional, well-scoped and bold digital investments for significant human development returns.[10]
- **Prioritizing what works:** if results are well measured and articulated,[11] these insights are crucial for guiding additional efforts within and beyond countries. This includes the role of data in informing the scaling of successful projects and interventions into other contexts and countries and for future digital initiatives.[12]
- **Crowding-in of additional support and partnerships:** demonstrating impact can be a powerful mobilizer for attracting additional investment, building new partnerships and moving beyond individual technologies and use cases towards a whole-of-society approach to digital transformation.

Rigorous and considered measurement of the return-on-investment of digital transformation would enable a better appreciation of the wide-ranging and catalytic potential of digital. It could allow all stakeholders to have a better picture of the positive and negative multiplier effects of digital transformation and to improve their understanding of the role of digital in driving development efforts. Greater understanding of the returns of digital investments could shape a compelling argument for governments with multiple competing priorities in their national agendas to prioritize and position digital. This improvement could translate into key policy and institutional components that underpin sustainable digital development: the availability of digital funding, senior political engagement with digital (creating a mandate for digital transformation) and a commitment to shaping a whole-of-government and whole-of-society approach.

Existing approaches to measuring effects of digital transformation

Identifying return-on-investment of digital transformation can be challenging as there is no single definition of digital transformation nor any single methodology or framework. In addition, existing methods of exploring the effects of digital transformation are often country-specific, focused on particular sectors or themes (such as health or gender) and fragmented—ranging from high-level conceptual approaches and frameworks to various economic models and indices attempting to highlight or quantify digital impact.

While quantifying the national digital transformation effects, practitioners and researchers often explore correlations between digital transformation and various micro- or macro-economic indicators such as gross domestic product (GDP).[13,14] For example, the Government of Estonia notes that digitalization of public services saves the country the equivalent of more than 2 percent of its GDP annually, and digital service delivery saves Estonians the equivalent of more than 1,300 years of working time every year due to more efficient service delivery.[15] Additional approaches focus on technical indicators, like the number of people with mobile internet access, the number of public services digitized and whether or not particular laws have been implemented. Such metrics are important, but they do not engage with the broader and longer-term potential of digital.

Other approaches[9,16–17] that are getting some traction broaden this definition and set out a more social-focused perspective of digital transformation effects, such as enhanced human and social capabilities, societal well-being and outcomes, including trust, user satisfaction, participation[18] and effectiveness—alongside more traditional economic

metrics of impact. At a national level, some countries are also exploring the broader outcomes of digital—including the 'Smart Nation' approach in Singapore[19] and the National Digital Transformation Agendas in Vietnam[20] and Trinidad and Tobago.[21]

Development return-on-investment for national digital transformation

The Sustainable Development Goals (SDGs) were adopted by the United Nations in 2015. Traditional development outcomes are increasingly framed in the context of the 17 SDGs and their targets and indicators. Significant research has explored how digital transformation processes and technologies can accelerate attainment of the SDGs.[22–23] However, few countries have adopted an SDG-led approach to analyse and assess the return-on-investment of digital efforts. Recognizing this gap, this brief highlights the need for a new framework for measuring the economic, social, environmental, cultural and broader human development value of digital transformation: return-on-investment in digital transformation (RoI-DT).[24] RoI-DT uses the 2030 Agenda preamble framing of people, planet, prosperity, peace and partnerships to identify potential measurement opportunities for unpacking and illustrating the development power of digital.[25]

People

The impact in this domain often focuses on efficiency or productivity, such as time saved in digitizing processes to deliver social protection payments or improvements in farm yield enabled by digital tools and technologies. However, broader RoI-DT outcomes are important in recognizing a wider return-on-investment of digital. For example:

- **Social inclusion and human rights improvements:** how digital tools and channels can lead to an increase in citizen engagement by providing a voice and platform to more marginalized groups or a decrease in human rights violations.
- **The multiplier effect of digital:** how digital skills can spread throughout society[26]—and how digital can shape a 'multiplier effect', including amplifying the work of businesses.
- **Increased household income security:** beyond financial metrics, including how digital can provide opportunities for women to participate in the digital economy.

However, measuring these wider metrics can be difficult. The second- and third-order effects of digital can be hard to identify and harder to attribute. They can require longer-term and more qualitative research. Similarly, the negative effects of digital, for example, the long-term effects of harassment and other online abuse, also need to be explored. Strengthening existing measurement approaches could also provide greater value, for example, measuring citizen satisfaction in relation to digital public service delivery and then exploring how the time saved due to digitalization is utilized.

This wider approach is being explored in Bangladesh, where the government has been implementing its national strategy, Digital Bangladesh, since 2008. Its flagship programme, Access to Information (A2I), includes an analogue focus. In particular, A2I provides access to digital public services via a network of more than 8,858 physical digital centres.[27] A number of A2I Initiatives have saved Bangladeshi citizens the equivalent of 12.7 billion physical visits to government offices, US$21.6 billion in costs and 17 billion workdays among citizens.[28]

Planet

The core focus of the 2030 Agenda is sustainability so that the planet can support the needs of present and future generations. Digital plays a considerable role in this area, and the impact can often be very specific, including a focus on resource optimization. When exploring a broader measurement approach, sample RoI-DT outcomes could include:

- **Better preparedness, resilience and faster, more efficient response:** improving the quality and timeliness of response to climatic events, strengthening early warning systems and building community engagement.
- **Reductions in emissions due to digital interventions,** including through better-optimized processes and by leveraging digital tools and channels to reduce the need for travel.

A particular challenge in this context is the very real and negative impact that digital itself can have on the planet, from water and other resource usage of cloud technologies (and the emissions created by this infrastructure) to increases in e-waste. Efforts

to measure the carbon footprint of technologies or broader digital transformation should be prioritized. This includes the individual impact of technologies (such as training machine-learning and AI models[29]) and the environmental impact of digital value-chains from coding to cloud deployment.[30] These issues reaffirm the role of a RoI-DT approach: engaging with and measuring the broader impact of digital, both good and bad.

This approach is being tested in Uruguay, where the country's 670 km coastline is home to 70 percent of its population.[31] These coastal areas and the people who live there are highly vulnerable to sea level rise and extreme nature events. Therefore, by analysing historical and projected climate data, climate modelling and vulnerability assessment technology have been developed[32] to determine the threat of climate variability to Uruguay's coastal zones. The successful uptake of the climate modelling technology has enabled Uruguay to not only develop its COASTAL-National Adaptation Plan (NAP)[33] but also enhance its capacity and secure funding for its implementation. It also serves as a pilot that can be replicated in other countries in the region.

Prosperity

Many considerations of 'prosperity' centre on financial or economic returns. For example, improved efficiency leads to greater work outputs and greater income. However, there is a need to recognize how digital can lead to prosperity across countries and communities, particularly for more marginalized groups. Example outcomes could be:

- **Improved procurement processes:** using digital standards to shape more transparent government procurement processes, leading to better products and services for citizens and the inclusion of micro, small, and medium enterprises in providing these solutions.
- **Improvements in gender equality:** as highlighted by the Alliance for Affordable Internet, 30-plus lower-income countries have missed out on $1 trillion in GDP as a result of women's exclusion from digital. Closing this digital gender gap would deliver "an estimated US$524 billion increase in economic activity by 2025" to these countries.[34]

At the same time, digital can complicate matters, with exacerbating inequality, job losses, reduced salaries and more precarious contracts—all potential results of automation and other digital processes. Also, related aspects, such as the functioning of the digital sector, can prioritize financial returns over broader social or societal returns. This includes a focus on technological solutions and not the needs, realities or underlying context—or problem—at hand.

In contrast, the Government of Malawi's efforts to build a national digital ID system have had significant and positive effects, including those that go beyond financial benefits. With almost 100 percent of the eligible population now recorded in the National Register,[35] the country has seen improved case management in its justice system, more effective distribution of vaccines and a reduction in fraud cases reported to the police[36] and has saved $7 million in voter registration costs during 2019 elections. On the financial side, this work has also led to improved tax information, ensured more effective social benefits distribution and helped control benefit leakages due to its linkage with the national social benefits registry. This has included savings of over $20 million in annual payments to 'ghost' beneficiaries who should no longer be receiving such support.[18]

Peace

Digital plays an increasingly important role in catalyzing peace and advancing collective action and dialogue around the world. It can promote more inclusive decision-making and political participation as well as improve transparency and accountability. Some RoI-DT outcomes that would be important to consider are:

- **Country's resilience in the face of human-made conflicts and crisis:** using digital to keep a country operational and ensure citizens receive all necessary public services during a crisis.
- **Citizen participation in political and social life; social and political inclusion:** providing a platform and an opportunity to raise a voice, share an opinion and engage in public discourse.
- **Governance efficiency, transparency, accountability and anticorruption effects:** using digital to make decision-making processes more informed, effective, efficient and transparent.

However, digital also risks undermining efforts to shape safe and secure societies. Digital tools and channels can spread mis- and disinformation at an unprecedented pace and scale, leading to radicalization and entrenching marginalization. Digital can also strengthen surveillance and censorship efforts, while online harms can also transcend the digital world.

Ukraine has positioned digital as a key pillar in its approach to resilience and in pursuit of peace. The country's Diia platform, a digital service ecosystem and a cornerstone of Ukrainian digital transformation, is a lifeline for its citizens. Sixty-three percent of Ukrainians have used at least one digital public service,[37] and the country is shaping new services in response to conflict. This includes services to record war-related damage,[38] register for financial reimbursement and apply for recognition as an internally displaced person.[39]

Partnerships

UNDP's whole-of-society approach to digital transformation demands the engagement of all sectors, including the public and private sectors and civil society. Potential outcomes in this domain can include:

- **Increased trust, better dialogue and alignment** through better transparency and accountability and new and more effective means of working together.
- **Resource optimization and a time-saving effect from collective action and partnerships:** through more informed and efficient decision-making and data-driven approaches to assessment of resources and use.
- **Ecosystem impact:** including shaping new ways of working, new industries and sectors and developing positive multiplier effects.

However, attributing those effects to specific investments in digital can be a challenging task. And the increase in actors can also lead to negative outcomes, such as data and other privacy breaches caused by weak or ineffective digital infrastructure among organizations.

Partnerships can also lead to considerable financial returns. During the COVID-19 pandemic, the central health laboratory in Mauritius was in urgent need of a laboratory management information system to process virus tests. Through leveraging and adapting an existing open-source solution, the team—in collaboration with the developers of the solution—was able to save over $4 million by not building from scratch. This collaboration also provided a valuable opportunity for institutionalizing key digital skills within Mauritius.[40]

Reflections and recommendations

Digital has enormous potential for development, but only if its wide-ranging power and its possible risks are recognized. It can improve inclusion, sustainability, equality, participation and partnership. These functions can translate into financial, social, economic and other benefits for countries and societies. To achieve and measure these benefits, there is a need to:

- **Explore, unpack and quantify the development outcomes of digital, using the SDGs as a starting point.** When exploring the return-on-investment in national digital transformation, it is important to move beyond a singular focus on financial returns. Analysing the impact of digital through the lens of development outcomes and the SDGs could highlight the role of digital for countries—and ensure that it is positioned at the centre of development strategies. Further research and analysis are needed in this area.
- **Analyse the extent to which key groups are impacted by digital transformation.** To ensure that digital transformation benefits everyone, it is crucial to approach assessment of digital with a special focus on groups and communities that are at risk of being excluded.
- **Comprehensively map and record digital spending.** Costs associated with digital—including costs in digital literacy and competency building, up-front investment in hardware and software and ongoing costs—are not often reported in a systematic way (or may be rolled into larger departmental or national budgets). Being able to identify digital spend is a key part of understanding the return-on-investment that digital can enable.
- **Engage with the positive and negative multipliers of digital.** Governments and partners need to understand the net impact of digital on individuals, communities and environment, including working with communities to identify and tackle negative consequences. This also includes recognizing the difficulties of attribution and exploring broader monitoring, learning and evaluation approaches, including mixed-methods approaches, ethnography and other tools that could begin to explore causation.
- **Be open in thinking and delivery.** Governments should be open to sharing their learning and measurements to support other countries in navigating their respective digital transformation journeys. Similarly, governments can also benefit from open and open-source digital solutions that have been tested in other settings.

More broadly, all digital development actors, including the international development community, need to **invest in collecting data, build national capacities on measuring the development impact of digital and shape the narrative with evidence of impact**. Future investments in digital transformation efforts need specific direction, and more and better evidence of digital transformation development returns can and should help guide those interventions and make them more efficient. Developing a narrative around the returns, making a case for digital transformation with examples of impact is also important for crowding-in additional funding and partnerships. This includes building monitoring and evaluation skills within government to identify the impact of digital.

Although measuring digital transformation impact and its development value is a complex task, it is crucial to explore and further unpack this broader relationship. UNDP recognizes the need to demonstrate the effectiveness of its interventions and investments in achieving development outcomes that are often multidimensional and interlinked. UNDP is moving in the direction of developing a holistic RoI-DT framework and encourages governments and other development partners to adopt this thinking and support these efforts by exploring different ways of attributing digital interventions to development outcomes and sharing best practices and countries' impact stories.

Endnotes

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