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| **Abstract:** | This TD provides the updates on ITU’s Sustainable Digital Transformation activities. |

Please see below.

1. **TSB**

Please see below updates on Sustainable Digital Transformation activities under TSB:

* 1. **Digital Transformation Dialogues (DTD)**

The International Telecommunication Union (ITU) has been organizing the [**Digital Transformation Dialogues (DTD)**](https://www.itu.int/cities/digitaltransformationdialogues/). DTD offer a dynamic platform to facilitate a deeper understanding of emerging technologies to reshape traditional processes, improve operational efficiency and unlock new possibilities for innovation and standardization. The Digital Transformation Dialogues seeks to address evolving themes associated with digital transformation, foster cooperation among city stakeholders, and examine the role of standardization within this domain. The Digital Transformation Dialogues serve as a unique platform for highlighting the latest work and outcomes of the ITU-T Focus Groups, Initiatives and ITU-T Study Groups.

The Digital Transformation Dialogues encompass:

1. **Digital Transformation Webinars** covering topics ranging from Internet of Things (IoT), digital twin, metaverse, brain computer interface, cloud computing and artificial intelligence (AI) to data analytics, while delving into how we can harness the power of digital technologies to drive positive change and deliver sustainable value in the digital era to support the next digital wave.
2. **Fireside Chats** serve as a global platform for industry experts, thought leaders, and professionals to share their expertise on leveraging digital technologies across different verticals including smart cities, banking, transport, health, cybersecurity and sustainability to engage a diverse audience and explore the possibilities and challenges of the ever expanding digital landscape.
3. **Ask the Expert Sessions** help participants gain valuable insights into the vast ITU-T standardization hemisphere, while putting the spotlight on relevant best practices and emerging trends to facilitate informed decision-making in the quest for digital transformation.

The following events have been held in 2024 and 2025:

**Webinars**

* [Digital inclusion and accessibility: Leaving no one behind in virtual worlds and the citiverse](https://www.itu.int/cities/digitaltransformationdialogues/digital-inclusion-and-accessibility/) (15 May 2025)
* [ITU and ATU Webinar – Shaping Africa’s Digital Future: Governance in the Metaverse and Virtual Worlds](https://www.itu.int/cities/digitaltransformationdialogues/africa-virtual-worlds/) (25 February 2025)
* [City Horizons: Celebrating World Cities Day and Shaping Urban Futures](https://www.itu.int/cities/digitaltransformationdialogues/world-cities-day/) (31 October 2024)
* [Greening the Future: Navigating Digital Transformation for Land Restoration](https://www.itu.int/cities/digitaltransformationdialogues/digital-land-restoration/) (5 June 2024)
* [Connected Communities: Harnessing the Power of Digital Public Infrastructure](https://www.itu.int/cities/digitaltransformationdialogues/digital-public-infrastructure/) (21 May 2024)
* [UN 2.0 Week Side event on Harnessing the metaverse and virtual worlds for global impact](https://www.itu.int/cities/digitaltransformationdialogues/virtual-worlds-for-global-impact/) (26 April 2024)
* [Metaverso 360°: Explorando la Accesibilidad, la Inclusión y los Derechos Humanos en Dominicana Innova](https://www.itu.int/cities/digitaltransformationdialogues/metaverse-360/) (22 April 2024)
* [Immersive Inclusivity: Enhancing Virtual Worlds with Accessibility](https://www.itu.int/cities/digitaltransformationdialogues/inclusivity/) (2 April 2024)
* [Unleashing the Power of Digital Water Solutions: Exploring the flow of emerging technologies](https://www.itu.int/cities/digitaltransformationdialogues/digital-water/) (22 March 2024)
* [Future of real-love in the virtual world: The Perfect Date](https://www.itu.int/cities/digitaltransformationdialogues/love-metaverse/) (14 February 2024）

**Fireside Chats:**

* [Quantum Leaps: Pioneering the Future with Quantum Computing](https://www.itu.int/cities/digitaltransformationdialogues/quantum-computing/) (28 November 2024)
* [Less Power, Less Cost, More Impact – Tiny Machine Learning and Edge Artificial Intelligence To The Rescue](https://www.itu.int/cities/digitaltransformationdialogues/machine-learning/) (17 September 2024)
* [Ethical Horizons: Navigating Responsible AI in the Digital Landscape](https://www.itu.int/cities/digitaltransformationdialogues/responsible-ai/) (16 April 2024)
* [Beyond Boundaries: Revolutionizing Banking through Digital Transformation](https://www.itu.int/cities/digitaltransformationdialogues/banking/) (14 March 2024)
* [Prospects for Surgical Advances](https://www.itu.int/cities/digitaltransformationdialogues/20240118-2/) (18 January 2024）

**Ask the Expert Sessions**

* [Smart Submarine Cables: The future of disaster management](https://www.itu.int/cities/smart-submarine-cables/) (05 November 2024)
* [Exploring DLT Beyond Cryptocurrency: Applications and Opportunities](https://www.itu.int/cities/distributed-ledger-technology/) (23 July 2024)
* [Rester connecté: Explorer l’itinérance mobile internationale](https://www.itu.int/cities/digitaltransformationdialogues/mobile-roaming/) (27 June 2024)
* [Assessing the circularity of ICT goods](https://www.itu.int/cities/digitaltransformationdialogues/circularity/) (22 May 2024)
* [Breaking barriers in the metaverse: Improving accessibility](https://www.itu.int/cities/digitaltransformationdialogues/accessibility-metaverse/) (25 April 2024)
* [Guardians of Authenticity: Battling Counterfeiting](https://www.itu.int/cities/digitaltransformationdialogues/counterfeiting/) (28 March 2024)
* [Urban Intelligence Unveiled: AI Principles for Smart Cities](https://www.itu.int/cities/digitaltransformationdialogues/ai-principles-cities/) (21 February 2024)
* [Digital twin for smart cities](https://www.itu.int/cities/digitaltransformationdialogues/20240130-2/) (30 January 2024）
* [Ask the Expert Session - Rester connecté: Explorer l’itinérance mobile internationale](https://www.itu.int/cities/digitaltransformationdialogues/mobile-roaming/) (27 June 2024)

More information on the Digital Transformation Dialogues is available at: <https://www.itu.int/cities/digitaltransformationdialogues/>

* 1. **Digital Transformation Resource Hub**

The [Digital Transformation Resource Hub](https://www.itu.int/cities/dt-resource-hub/) continues to collate a range of quality publications on various digital transformation topics such as smart sustainable cities, AI, IoT, blockchain, digital twin, metaverse, digital public infrastructure and digital transformation trends.

* 1. **Publications**

Between July 2024 and May 2025, the ITU developed and distributed key publications focused on the topics of smart sustainable cities and the metaverse.

* [A Year of Impact – 2024](https://www.itu.int/net/epub/TSB/2024-A-Year-of-Impact-Advancing-sustainable-digital-transformation-with-ITU-standards/index.html#p=1)
* [U4SSC Key Performance Indicators for People-Centered Cities for city leaders](https://www.itu.int/net/epub/TSB/2024-U4SSC-Key-Performance-Indicators-for-People-Centered-Cities-For-city-leaders/index.html#p=1)
* [U4SSC Brochure – Connecting communities, empowering people](https://www.itu.int/net/epub/TSB/2024-U4SSC-Initiative-Connecting-Communities-Empowering-People/index.html#p=1)
* [Policy benchmarks for digital transformation of people-centred cities](https://www.itu.int/net/epub/TSB/2024-U4SSC-Policy-benchmarks-for-digital-transformation-of-people-centre/index.html)
* [Data and API requirements for centralized smart city platforms](https://www.itu.int/net/epub/TSB/2024-U4SSC-Data-and-API-requirements-for-centralized-smart-city-platforms/index.html)
	1. **Digital Transformation and Cities Digest**

The ITU has consistently published the Digital Transformation and Cities Digest, with editions being released in [January 2024](https://www.itu.int/cities/wp-content/uploads/2024/01/ITU-Digital-Transformation-and-Cities-Digest-Jan2024.html), [March 2024](https://www.itu.int/cities/wp-content/uploads/2024/03/ITU-Digital-Transformation-and-Cities-Digest-Mar2024.htm), [May 2024](https://www.itu.int/cities/wp-content/uploads/2024/05/ITU-Digital-Transformation-and-Cities-Digest-May2024.htm), [July 2024](https://www.itu.int/cities/wp-content/uploads/2024/07/ITU-Digital-Transformation-and-Cities-Digest-July2024.htm), [September 2024](https://www.itu.int/cities/wp-content/uploads/2024/09/Digest-September-2024.htm), [December 2024](https://www.itu.int/cities/wp-content/uploads/2024/12/Digest-December-2024.htm) and [March 2025](https://www.itu.int/cities/wp-content/uploads/2025/03/Digest-March-2025.htm). Copies of the Digest are available for access on the [Digital Transformation and Cities Digest webpage](https://www.itu.int/cities/dt-digest/).

* 1. **U4SSC Thematic Group on Enabling People-Centred Cities through Digital Transformation**

As part of the [United for Smart Sustainable Cities (U4SSC)](https://u4ssc.itu.int/), which is a global UN initiative supported by 19 UN entities, a Thematic Group on Enabling People-Centred Cities through Digital Transformation is conducting its work through five working groups:

* Working Group 1: Setting the Context: Digital Transformation for People-oriented Cities
* Working Group 2: Policy Benchmarks for Digital Transformation for People-oriented Cities
* Working Group 3: Digital Transformation Assessment for People-oriented Cities
* Working Group 4: Guidelines for Unlocking Net Zero in Cities Through Sustainable Digital Transformation
* Working Group 5: Intergenerational Procurement for People-Centred Cities

More information is available at: <https://u4ssc.itu.int/thematic-groups/>.

* 1. **A Year of Impact – *Advancing sustainable digital transformation with ITU standards in 2024***

The Year of Impact 2024 report offers an in-depth view of ITU’s accomplishments on sustainable digital transformation, smart sustainable cities, metaverse and virtual worlds. Looking ahead, ITU remains dedicated to fostering collaboration for a digital future for all.

Key highlights include:

1. **Global Initiatives and Events:**
	* The **World Telecommunication Standardization Assembly (WTSA-24)** and **Global Standards Symposium (GSS-24)** set priorities for standards in emerging technologies, including AI, the metaverse, and digital infrastructure.
	* The **UN Virtual Worlds Day** explored the transformative potential of immersive technologies like the metaverse for sustainable urban development.
2. **Focus on Virtual Worlds:**
	* Launch of the [**Global Initiative on Virtual Worlds – *Discovering the Citiverse***](https://www.itu.int/metaverse/virtual-worlds/), which bridges real and virtual urban environments to promote sustainability, inclusion, and accessibility.
3. **Standards Development:**
	* The [ITU-T Study Group 20](https://www.itu.int/en/ITU-T/studygroups/2025-2028/20/Pages/default.aspx) advanced frameworks for IoT, digital twins, and smart cities, issuing over 50 international standards.
	* Focus groups on the metaverse and AI for agriculture provided expert guidance on merging physical and digital spaces for sustainable solutions.
4. **Smart Sustainable Cities:**
	* The [**United for Smart Sustainable Cities (U4SSC)**](https://u4ssc.itu.int/) initiative expanded with new thematic groups and performance indicators, aiding over 200 cities in adopting smart, sustainable strategies.
5. **Collaborative Efforts:**
	* ITU partnered with various organizations, including the ISO, IEC, and the LoRa Alliance, to harmonize global standards and accelerate smart city innovations.
6. **Knowledge Sharing:**
	* The ITU hosted 21 webinars and interactive sessions to disseminate insights on emerging technologies like quantum computing, AI, and digital public infrastructure.

This report reflects ITU’s commitment to leveraging technology for global sustainability and resilience while fostering collaboration across governments, industry, and international bodies.

Reflect on the advancements and initiatives in smart sustainable cities, the metaverse, and virtual worlds from 2024. For more details, visit: <https://www.itu.int/cities/a-year-of-impact-2024/>

* 1. **Digital Financial Services Security Lab: Security of mobile payments**

The security of mobile payments is a crucial aspect of digital transformation in finance, involving robust measures to protect against various threats to create trust in usage of digital financial services. Key technologies like tokenization and encryption, along with practices like two-factor authentication and biometric authentication, are essential for maintaining user trust and preventing fraud. Mobile payment security also addresses vulnerabilities in mobile devices and apps, security of the telecommunications infrastructure, security of the mobile payment app and adoption of secure application development practices.

The ITU DFS Security Lab was set up in 2021 by TSB as part of the Financial Inclusion Global Initiative (FIGI) activities and provides a methodology for testing systemic vulnerabilities in mobile payments app and SIM cards and collaborates with DFS regulators in emerging economies for the adoption of the DFS Security recommendations from ITU, standards that address systemic vulnerabilities in DFS applications and facilitate knowledge sharing on addressing security vulnerabilities in digital financial services applications.

The activities for the DFS Security Lab can be grouped under the following areas:

1. Adoption of the DFS Security Recommendations
2. Organisation of DFS Security Clinics
3. Knowledge transfer programme for the DFS security lab
4. Organization of DFS Security Webinars

Parts of the DFS security recommendations have been adopted as ITU-T Recommendations by ITU-T Study Group 17 and their adoption are part of the knowledge transfer programme. These include:

1. **ITU-T X.1150**: Security assurance framework for digital financial services ([https://www.itu.int/rec/T-REC-X.1150/en](https://www.google.com/search?q=https://www.itu.int/rec/T-REC-X.1150/en))
2. **ITU-T X.1456**: Security guidelines for digital financial service (DFS) applications based on unstructured supplementary service data (USSD) and subscriber identification module tool kit (STK)

The ITU’s Digital Financial Services (DFS) security recommendations and guidelines have been adopted by two regional telecommunications regulatory bodies in Africa: EACO (East African Communications Organization) and CRASA (Communications Regulators’ Association of Southern Africa). Countries in Africa which have adopted the DFS security recommendations including the MoU between the telecom regulator and Central Bank for DFS Security so far include Nigeria, Lesotho, Sierra Leone, Tanzania, Uganda, and Zimbabwe. Collaboration with CRASA, EACO and WATRA are ongoing on the adoption of the DFS Security Recommendations.

ITU DFS Security Lab has organised 26 DFS Security Clinics in several countries in Africa and Latin America during the period June 2024 to April 2025 (see Table 1 below). The clinics were attended by over of 1,232 participants. The security clinics were aimed at explaining the ITU DFS security recommendations and implementation of ITU-T [X.1150 : Security assurance framework for digital financial services](https://www.itu.int/rec/T-REC-X.1150-202403-P/en) to the DFS regulators both from the telecom and the financial services sectors.

The DFS Security Lab conducted the knowledge transfer programme at the request of regulators in Tanzania, Peru, Uganda, The Gambia, Zimbabwe and Lesotho. Similar requests from Ethiopia, Burkina Faso and Gabon have been received in 2025 and are being implemented. The main objectives of the knowledge transfer programme for the DFS Security Lab are to provide assistance to regulators in emerging economies to set up the DFS Security Lab in their country and provide capacity building for [X.1150 : Security assurance framework for digital financial services](https://www.itu.int/rec/T-REC-X.1150-202403-P/en) and conduct the security audits of mobile payment apps based on the OWASP methodology. TSB conducted a knowledge transfer programme for security audit of Android mobile payments app for the Postal Technology Centre (PTC) in 2024.

As part of its efforts to promote awareness of the DFS Security Recommendations and best practices for mobile payments security, the DFS Security Lab launched a series of [online webinars on DFS security](https://ituint.sharepoint.com/sites/DFSSecurityLab/Shared%20Documents/General/This%20webinar%20is%20the%20first%20of%20a%20series%20focusing%20on%20security%20of%20digital%20financial%20services%20and%20organized%20as%20part%20of%20the%20activities%20of%20the%20ITU%20DFS%20security%20lab.) in 2025.

The following webinars have been completed in 2025:

* **Episode #​1​**:  Addressing SS7 Vulnerabilities affecting Digital Financial Services (18 February 2025): This inaugural webinar focused on exploring SS7 security vulnerabilities within the DFS sector. Discussions covered effective mitigation strategies, including the adoption of security standards to protect DFS and telco providers from fraudulent activities and resulting breaches. The session was attended by 223 participants from 40 countries, primarily in Africa.
* **Episode #2**: Securing Mobile Payment Applications – Part 1 (26 March 2025): This webinar provided technical guidance and highlighted minimum-security best practices for Android-based DFS applications. Participants learned about a template of application security best practices derived from ITU-T standard  [X.1150: Security assurance framework for digital financial services​](https://www.itu.int/rec/T-REC-X.1150-202403-I/en), designed for adoption by DFS regulators and as a guide for DFS providers. The session outlined minimum mobile application security practices to enhance the resilience of mobile payment applications and protect users from emerging threats. This session had 188 participants from 46 countries.
* **Episode #3:** Securing Mobile Payment Applications – Part 2 (28 April 2025): This webinar continues the discussion from Part 1, showcasing effective strategies implemented by regulators and DFS providers to adhere to technical guidance and establish minimum-security best practices for smartphone-based DFS applications.
* **Episode #4:** Securing the USSD and STK Infrastructure for Mobile Payments (28 May 2025): This webinar will focus on the security challenges and best practices associated with USSD (Unstructured Supplementary Service Data) and STK (SIM Application Toolkit) infrastructure, which are commonly used for mobile payment services. Experts will discuss vulnerabilities and mitigation strategies to ensure the security of these channels.
1. **BDT**

Please see below updates on Sustainable Digital Transformation activities under BDT:

BDT, through its Secretariat, is currently executing a series of initiatives, programmes and activities aimed at achieving digital transformation in a holistic and systematic manner.

1. BDT work on Digital Transformation implemented through the BDT Operational Plan can be found in document TDAG-25/2.
2. Against the background of WTDC Resolution 89 (Kigali, 2022) on Digital transformation for sustainable development, BDT has developed a framework and strategic approach to support countries in accelerating digital transformation, through a strategic four phase engagement process towards implementation and monitoring, leveraging from ITU-D priorities and enablers, BDT areas of work, and modalities, ensuring no one is left behind. Together, our team in headquarters and in regional offices work with members to bridge the digital and skills divide and drive digital transformation to leverage the power of ICTs. Our expertise is driven by ITU-D priority topics adopted at the WTDC. The Approach and framework are available in document [TDAG-25/2](https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.itu.int%2Fdms_pub%2Fitu-d%2Fmd%2F22%2Ftdag32%2Fc%2FD22-TDAG32-C-0012!N2!MSW-E.docx&wdOrigin=BROWSELINK).
3. BDT-wide efforts to support individual countries plans and efforts towards digital transformation. Notable examples include:
	* Digital government transformation
	* Increasing access for Member States to ITU tools and knowledge products to accelerate digital transformation through the GovStack project, under which a set of 15 specifications for digital government building blocks (e.g., Id, payments, exchange, consent, registries, e-Signature, GIS, eMarketplace, etc.) were published.
* Capacity and Skills Development Programmes, Tools, and Platforms
	+ The ITU Academy and the ITU Academy Training Centres (ATCs).
	+ Capacity Development for Digital Transformation funded by the European Commission to provide ITU Academy training to policymakers and government officials within the ICT sector.
	+ The Digital Transformation Centres (DTC) Initiative.
* Policy and Regulation Tools
	+ The Digital Regulation Platform and Training.
	+ The G5 Benchmark and tools employed to assess of the state of readiness of national policy, legal and governance frameworks for digital transformation.
	+ The visualization tools on the G5 Accelerator platform that allow for a deep and customized analysis of data based on 54 indicators by region and country.
* Data and Analysis
	+ ITU Statistics collects and disseminates vital information and research to support evidence-based decision-making for universal and meaningful connectivity and sustained digital transformation.
	+ The ITU Environment Division produces key products and services, including data and analysis, for a green digital transformation.
* Digital infrastructure planning, development, and deployment
* Initiatives on gender, youth, accessibility, and cybersecurity to support inclusive digital transformation, and safe use of digital technologies and services

Given the importance of this topic for the work of ITU-D, BDT ensures cohesion and coordination of efforts, avoids duplication of mandates and scope of work, and fosters cross-sector coordination.

1. **BR**

Updates on Sustainable Digital Transformation activities under BR are provided below:

**Energy Aware Broadcasting**

ITU-R Study Group 6 (Broadcasting service) produced the following deliverables:

1. Question [ITU-R 147/6](https://www.itu.int/pub/R-QUE-SG06.147) “Energy Aware Broadcasting Systems” requests studies in order to identify how broadcasting can be made more efficient. Subjects to be studied include:
* The direct impact that the technologies and features used for broadcasting have on energy consumption
* The indirect impact that the use of external services used for broadcasting have on overall energy consumption
* The metrics to be used to quantify and report both the direct and indirect impact on energy consumption
1. Recommendation [ITU-R BT.2167](https://www.itu.int/rec/R-REC-BT.2167/en) “A framework for content-adaptive methods for reduction of energy consumption in television displays”
2. This Recommendation defines a framework for content-adaptive methods that may mitigate energy consumption by television displays without unduly impacting visual quality.
3. Report [ITU-R BT.2540](https://www.itu.int/pub/R-REP-BT.2540) “Display energy reduction through image signal processing”
4. This Report describes content-adaptive image signal processing techniques that may mitigate energy consumption while minimizing the impact on visual quality.
5. Report [ITU-R 2521](https://www.itu.int/pub/R-REP-BT.2521) “Practical examples of actions to realize energy aware broadcasting”
6. This Report is intended to assist broadcasters and broadcasting related organizations to implement sustainability strategies and assess and reduce their impact on the environment.
7. Report [ITU-R BT.2385](https://www.itu.int/pub/R-REP-BT.2385) “Reducing the environmental impact of terrestrial broadcasting systems”

This report proposes Life Cycle Assessment (LCA) methodology for assessing environmental impact of Broadcasting delivery. It also provides case studies from broadcasters which explain how they could reduce the environmental impact of their business activities.

1. Opinion [ITU-R 104](https://www.itu.int/pub/R-OP-R.104) “Advice for sustainability strategies incorporating carbon offsetting policies”

Robust sustainability strategies are essential to move towards net zero and encourage the implementation of robust energy efficiency schemes that reduce energy consumption before considering carbon offsetting protocols as a last resort.

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