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Accessibility as Infrastructure: An Integrated Model from Romania

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Abstract

Accessibility implementation across Europe is increasingly supported by international standards, European harmonized regulations, and national legal frameworks. However, in practice, accessibility often remains fragmented, project-based, and compliance-driven.

This article presents an integrated accessibility ecosystem developed by a Romanian non-governmental organization, designed to translate complex regulatory and standards-based requirements into coordinated implementation practice. Framed within Romanian legislation (Law No. 448/2006; Government Emergency Ordinance No. 112/2018; Law No. 232/2022) and technical regulations (Order No. 189/2013 approving NP 051-2012), grounded in the United Nations Convention on the Rights of Persons with Disabilities (2006), and aligned with ISO 21542, ISO 21902, EN 17210, WCAG 2.1/2.2, and EN 301 549, the model integrates structured assessment, cultural accessibility innovation, inclusive tourism implementation, knowledge dissemination, and social economy-based service provision.

The ecosystem includes the digital assessment tool Audara, the multisensory heritage initiatives [Feel the City](#) and [Feel Brâncusi](#), accessible tourism services delivered through the specialized

operator Accessible Romania by Sano Touring, the national accessibility resource hub România Accesibilă, and the protected unit [Accesibilitate 360](#) employing persons with disabilities as trained professionals. The article argues that systemic integration of these components enhances sustainability, professional credibility, and replicability of Design for All implementation beyond isolated compliance measures.

Keywords

Design for All; Accessibility ecosystem; Inclusive tourism; Cultural accessibility; Social economy; Built environment accessibility standards; Digital accessibility

1. Introduction

Accessibility has evolved from a rights-based claim toward a structured policy and standardization domain. The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD, 2006) established accessibility as a precondition for equal participation. Subsequent international and European standards have translated this principle into operational criteria. ISO 21542:2011 defines technical requirements for accessibility and usability of the built environment, while ISO 21902:2020 provides guidance for accessible tourism services. EN 17210:2021 further articulates functional accessibility requirements within the European context. In digital environments, the Web Content Accessibility Guidelines (WCAG 2.1 and WCAG 2.2) and EN 301 549 (ETSI, 2021) establish measurable criteria for ICT accessibility. At policy level, Directive (EU) 2019/882 (European Accessibility Act) and the European Accessibility Resource Centre AccessibleEU support harmonization and capacity building across Member States.

Despite this normative architecture, implementation frequently remains fragmented. Accessibility interventions are often limited to isolated physical adaptations, temporary cultural initiatives, or minimal compliance-driven digital adjustments. Cross-sector integration between built environment, tourism, cultural heritage, and digital communication remains limited. Furthermore, persons with disabilities are rarely employed as trained professionals within accessibility service provision, weakening both the legitimacy and sustainability.

This article analyses a strategic accessibility ecosystem developed within a civil society framework, designed to translate complex regulatory and standards-based requirements into coordinated implementation practice. In contexts where accessibility responsibilities are distributed across multiple institutions and sectors, fragmented execution often limits impact. The CED Accessibility Ecosystem responds by integrating structured assessment, service provision, cultural innovation, tourism implementation, knowledge dissemination, and social economy-based employment within a coherent organizational model. The ecosystem operates within existing legal frameworks while demonstrating how coordinated, standards-aligned implementation can bridge structural gaps.

2. Regulatory and Standards Framework

Accessibility implementation operates within a complex multi-level framework.

At international level, ISO 21542 (2011) establishes technical parameters for accessibility of buildings and external environments, while ISO 21902 (2020) defines requirements for accessible tourism

services. These standards provide a globally recognized reference structure for implementation.

At European level, EN 17210:2021 defines functional accessibility requirements for the built environment, complementing ISO 21542 and supporting harmonization across Member States. Digital accessibility is governed by WCAG 2.1/2.2 and EN 301 549 (ETSI, 2021), while Directive (EU) 2019/882 extends accessibility obligations to products and services, including banking, e-commerce, ticketing, and digital interfaces.

In Romania, Law No. 448/2006 establishes accessibility obligations for public and private entities, Ministry Order 189/2013 approves technical regulation NP 051-2012, which details requirements for adapting civil buildings and urban spaces to the needs of persons with disabilities. Government Emergency Ordinance No. 112/2018 transposes the EU Web Accessibility Directive into national law, and Law No. 232/2022 transposes the European Accessibility Act.

This regulatory architecture demonstrates that accessibility is a structural dimension of infrastructure, services, and digital systems. However, standards alone do not ensure effective implementation. Structured tools, professional capacity, and cross-sector integration are required to translate normative frameworks into operational practice.

3. CEDAccessibility Ecosystem: Structure and Operational Logic

The CED accessibility ecosystem integrates five interdependent layers.



Fig. 1 Logo of the CED Romania Association - Centre of Excellence through Diversity

3.1 Structured Accessibility Assessment: Audara



Fig. 2 Logo Audara app

Audara is a digital assessment tool designed to structure evaluation of accessibility in the built environment and related services. The tool maps national legal criteria (OrderNo. 189/2013; Law No. 448/2006) against international standards (ISO 21542) and European requirements (EN 17210), while integrating experiential expertise of persons with disabilities and Romanian accessibility specialists with international training involved in its development.

Assessment categories include circulation, vertical mobility, sanitary facilities, signage, tactile guidance, lighting, and service interfaces. Rather than functioning as a checklist, the tool enables accessibility

audits, data-driven decision-making, prioritization of interventions, and traceability of accessibility measures.

Alignment with ISO 21902 extends assessment logic to tourism-related services, facilitating cross-sector evaluation. By translating normative frameworks into structured metrics, Audara serves as the technical backbone of the ecosystem.

3.2 Cultural Accessibility: From Pilot to Scaled Model



Fig. 33D tactile models of the Iosefin Water Tower and of the Water Museum, connected to the proprietary [ArtEcho](#) multimedia guide, with text and multilingual audio information, and Romanian Sign Language interpretation. The models were part of the “Feel the City” pilot concept of an accessible and inclusive exhibition organized in Timișoara, Romania, the European Capital of Culture 2023.

The cultural layer evolved through a methodological progression.

“Feel the City” functioned as a pilot initiative introducing multisensory accessibility in urban cultural and heritage contexts. Tactile 3D models of cultural buildings and spaces, multilingual audio description, and accessible digital interfaces enabled spatial

understanding beyond visual interpretation. Co-creation with persons with disabilities ensured experiential validation.



Fig. 4. The logo of "Feel Brâncuși" project, aiming to make accessible Constantin Brâncuși's original artwork in Romania.

Building on this methodology, "Feel Brâncuși" represents thematic scaling. Focused on the sculptural works of Constantin Brâncuși, the project applies validated multisensory interpretation techniques to nationally significant cultural heritage. Tactile reinterpretation of sculptural forms, integrated audio description, and content in sign language extend cultural accessibility beyond symbolic inclusion toward structured multisensory engagement.

The pilot-to-scale trajectory demonstrates methodological learning, refinement, and replicability.

3.3 Accessible Tourism in Practice

Accessible tourism integration is implemented through both CED Romania Association and the specialized tour operator Accessible Romania by Sano Touring.



Fig. 5. The logo of Accessible Romania by Sano Touring, a specialized tour company based in Bucharest.

The strategy combines accessibility audits, professional training, and service design and delivery across the entire tourism value chain, including accommodation providers, cultural institutions, transport interfaces, and digital communication channels. Alignment with ISO 21902 ensures that accessibility is embedded in service quality criteria rather than treated as an add-on or niche market segment.

Training programs for tourism professionals address communication practices, operational procedures, reasonable accommodation, and inclusive visitor experience design. These programs are delivered through tailored consultancy-based interventions as well as through European partnerships.



Fig. 6. The logo of WeNaTour- The European Alliance for Innovation and Sustainability Education in Welfare, Nature and Tourism Erasmus+ Project.

A significant scaling mechanism is the Erasmus+ project WeNaTour- The European Alliance for Innovation and Sustainability Education in Welfare, Nature and Tourism. Within this consortium, accessibility is integrated into structured higher-education and vocational learning modules on sustainable tourism. The operational expertise developed through Accessible Romania by Sano Touring, including

structured audits, destination-level implementation, and inclusive visitor experience design, is directly incorporated into lectures and curriculum content on accessibility and accessible tourism. This ensures that training materials reflect applied field experience rather than purely theoretical frameworks.

Through course design contributions and lectures within the WeNaTour learning activities, the ecosystem extends its implementation knowledge into European educational capacity building, linking accessibility with sustainable tourism development.

3.4 Knowledge Infrastructure: România Accesibilă



Fig. 7. The logo of România Accesibilă accessibility resources platform

The ecosystem is consolidated through the national accessibility resource hub România Accesibilă.

The platform centralizes national and European good practices, research references and professional articles related to accessibility in Romania and Europe. Accessibility-related service providers and inclusive events are listed, facilitating networking and visibility.

An e-learning hub is under development, including short webinars addressing disability awareness and topics connected to physical, informational, and communicational accessibility.

By bridging implementation and knowledge dissemination, the platform functions as a capacity-building interface. It supports

professional awareness, informed decision-making, and transparency of accessibility practices.

3.5 Service Delivery and Inclusive Employment: Accesibilitate 360



Fig. 8. The logo of Accesibilitate 360. The slogan says in Romanian: "We create accessibility. We build inclusion".

Accesibilitate 360 operates as the service-delivery engine of the CED accessibility ecosystem under the Romanian social economy legislation as a protected unit.

Accesibilitate 360 provides built environment audits using the Audara tool; digital accessibility audits based on WCAG and EN 301 549; accessibility training for public institutions and private operators; 3D tactile model printing; and accessibility enhancement of exhibitions through integration with the ArtEcho multimedia guide and tactile models.

A defining characteristic is the direct involvement of persons with disabilities as trained auditors, testers, and trainers. Experiential expertise strengthens the validity of assessments while generating employment within the accessibility sector. This integration of professional service delivery and social economy principles enhances both ethical coherence and sustainability.

4. Cross-Sector Integration and Replicability

The CED accessibility ecosystem integrates built environment, digital accessibility, tourism, cultural heritage, and employment structures within a single framework. Feedback loops connect assessment outcomes to implementation, training, and knowledge dissemination. Cultural pilot initiatives inform tourism integration, while digital audits support communication platforms. Employment through the protected unit sustains service provision.

Replicability depends on three conditions:

- 1. Alignment with national legislation and international standards;**
- 2. Structured assessment tools enabling measurable evaluation;**
- 3. Integration of experiential expertise within professional service delivery.**

The model demonstrates that civil society actors can operationalize complex regulatory frameworks through structured organizational ecosystems capable of integrating assessment, service delivery, and capacity building.

5. Lessons Learned

Implementation revealed several challenges. Accessibility is often misunderstood as charitable gesture rather than structural requirement. Financial planning for accessibility interventions remains limited, and fragmentation between sectors inhibits coordinated action. Sustaining financial viability without compromising methodological rigor remains a continuous strategic challenge.

However, integration of assessment tools, service delivery, and knowledge dissemination enhances credibility. Involvement of persons with disabilities as professionals strengthens legitimacy. Alignment with ISO and European standards facilitates dialogue with institutions and private operators.

6. Conclusion

Accessibility is increasingly embedded within international standards, European regulations, and national legislation. Yet effective implementation requires more than compliance.

The CED accessibility ecosystem demonstrates how accessibility can function as structured organizational practice when assessment, cultural innovation, tourism services, knowledge dissemination, and social economy-based employment are integrated.

By aligning normative frameworks with structured tools and professional capacity, accessibility becomes measurable, economically viable, and replicable. The model contributes to the Design for All discourse by illustrating how cross-sector integration and employment inclusion can transform accessibility from fragmented adjustment into structured, standards-aligned organizational practice.

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