



## **User-Centric Approach in the digital ecosystem; The User Information System and Smart Customized Services; Concept, definition and services**

ETSI TR 104 027 V1.1.1 (2025-10)

<https://standards.itech.ai/catalog/standards/etsi/934b7f26-ffb6-4340-bf38-d96f9f1cafd1/etsi-tr-104-027-v1-1-1-2025-10>

## Reference

DTR/USER-0055

## Keywords

QoS, security, UIS, USER

**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° w061004871

**Important notice**

The present document can be downloaded from the  
[ETSI Search & Browse Standards](#) application.

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format on [ETSI deliver](#) repository.

Users should be aware that the present document may be revised or have its status changed, this information is available in the [Milestones listing](#).

If you find errors in the present document, please send your comments to the relevant service listed under [Committee Support Staff](#).

If you find a security vulnerability in the present document, please report it through our [Coordinated Vulnerability Disclosure \(CVD\)](#) program.

**Notice of disclaimer & limitation of liability**

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

**Copyright Notification**

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2025.  
All rights reserved.

# Contents

Intellectual Property Rights .....	5
Foreword.....	5
Modal verbs terminology.....	5
1 Scope .....	6
2 References .....	6
2.1 Normative references .....	6
2.2 Informative references.....	6
3 Definition of terms, symbols and abbreviations.....	8
3.1 Terms.....	8
3.2 Symbols.....	9
3.3 Abbreviations .....	9
4 Smart Customized Services for UIS.....	10
4.1 Identification of the problem to be solved.....	10
4.2 Application of the ACIFO model in SCS .....	12
5 Use cases for User Information Systems.....	13
5.1 Introduction to use cases for UIC and their service composition .....	13
5.2 Urban mobility use case (Smart Urban Mobility Assistant) .....	14
5.3 Agriculture .....	16
5.4 Health .....	19
5.5 Assurance of Health and Safety in an IoT enabled construction environment .....	20
6 Regulatory and other constraints that may apply to UIS/SCS .....	21
6.1 Data governance .....	21
6.2 Privacy and data protection .....	22
6.3 Security .....	22
6.4 Data semantics and ontology.....	23
6.5 Accessibility .....	23
6.6 Ethics Considerations .....	23
7 Recommendations for further specification of ACIFO in SCS .....	25
7.1 General requirements for the Digital Ecosystem.....	25
7.1.1 Overview and introduction .....	25
7.1.2 The architectural dimension.....	26
7.1.3 The communication dimension.....	27
7.1.4 The Informational Dimension:.....	28
7.1.5 The functional Dimension .....	29
7.1.6 The Organizational Dimension .....	31
7.2 UIS/SCS requirements User side (userware).....	31
7.2.1 Userware Interactions with the ecosystem components.....	31
7.2.2 User Centric Vision .....	33
<b>Annex A: Assist-IoT project overview .....</b>	<b>34</b>
<b>Annex B: i-Tour project overview .....</b>	<b>35</b>
<b>Annex C: i-locate project overview.....</b>	<b>37</b>
<b>Annex D: Detail of regulatory factors to be considered in UIC/SCS.....</b>	<b>38</b>
D.1 Privacy aspects .....	38
D.1.1 General overview .....	38
D.1.2 Identification of Data Controller .....	38
D.1.3 Identification of Data Processor .....	38
D.1.4 Identification of affected user (data subject) .....	38
D.1.5 Other privacy impacting aspects .....	39

D.2	Security.....	40
D.3	Data semantics and ontology.....	41
D.4	Data portability.....	41
D.5	Accessibility aspects.....	42
<b>Annex E:</b>	<b>Example of Application of ACIFO model to tomato cultivation (user side ).....</b>	<b>45</b>
E.1	Overview .....	45
E.2	Functions and features.....	45
E.2.1	Real-time environmental (Sensors → UIS).....	45
E.2.2	Anomaly detection (Userware).....	46
E.2.3	Expert validation and AI model selection (Agronomy Expert).....	46
E.2.4	AI-based anomaly analysis (AI Engine).....	46
E.2.5	Corrective recommendations (Userware + Expert support) .....	46
E.2.6	Farmer decision-making and feedback (Farmer → Userware) .....	46
<b>Annex F:</b>	<b>Bibliography .....</b>	<b>47</b>
History .....		48

# iTeh Standards (<https://standards.iteh.ai>) Document Preview

[ETSI TR 104 027 V1.1.1 \(2025-10\)](https://standards.iteh.ai/catalog/standards/etsi/934b7f26-ffb6-4340-bf38-d96f9f1cafd1/etsi-tr-104-027-v1-1-1-2025-10)

<https://standards.iteh.ai/catalog/standards/etsi/934b7f26-ffb6-4340-bf38-d96f9f1cafd1/etsi-tr-104-027-v1-1-1-2025-10>

---

# Intellectual Property Rights

## Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the [ETSI IPR online database](#).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

## Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™**, **LTE™** and **5G™** logo are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

---

## Foreword

This Technical Report (TR) has been produced by ETSI Special Committee User Group (USER).

---

## Modal verbs terminology

In the present document "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

# 1 Scope

The present document presents an analysis of the user expectations, with respect to the study of data driven technologies (Artificial Intelligence (AI), deep learning, Machine Learning (ML)) to present the definition and concept of the User Information System (UIS), that enables Smart Customized Services (SCS) from both user and provider side. These services aim to provide personalization, adaptability, and intelligent decision support within the digital ecosystem.

NOTE: The UIS and SCS are designed to serve a broad spectrum of users. Their objective is to empower and protect all citizens. By integrating smart and assistive technologies, the system seeks to enhance participation in public, social, and economic activities, while also offering advanced users more autonomy and self-management capabilities.

# 2 References

## 2.1 Normative references

Normative references are not applicable in the present document.

## 2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long-term validity.

The following referenced documents may be useful in implementing an ETSI deliverable or add to the reader's understanding, but are not required for conformance to the present document.

- [i.1] [ETSI TR 103 438](#): "User Group; User centric approach in Digital Ecosystem".
- [i.2] [ETSI EG 203 602](#): "User Group; User Centric Approach: Guidance for users; Best practices to interact in the Digital Ecosystem".
- [i.3] [ETSI TR 103 603](#): "User Group; User Centric Approach; Guidance for providers and standardization makers".
- [i.4] [ETSI TR 103 604](#): "User Group; User centric approach; Qualification of the interaction with the digital ecosystem".
- [i.5] [Directive \(EU\) 2019/882](#) of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services (Text with EEA relevance).
- [i.6] [EN 301 549 \(V3.2.1\) \(2021-03\)](#): "Accessibility requirements for ICT products and services".
- [i.7] [ISO 9241-210:2019](#): "Ergonomics of human-system interaction; Part 210: Human-centred design for interactive systems", Edition 2; 2019.
- [i.8] Interaction Design Foundation: "[Design for All](#)".
- [i.9] Centre for Excellence in Universal Design: "[The 7 Principles](#)".
- [i.10] ETSI EG 202 116 (V1.2.2) (2009-03): "Human Factors (HF); Guidelines for ICT products and services; "Design for All"".
- [i.11] ETSI TS 102 747 (V1.1.1) (2009-12): "Human Factors (HF); Personalization and User Profile Management; Architectural Framework".