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User Centric approach in Digital Ecosystem; The Smart Interface; Part 2: Smart Identity: A Proof of Concept

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Foreword

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

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.1].

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).

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Introduction

The present document is associated with a demo of the Smart Identity Proof of Concept (see annex A).

1 Scope

The present document demonstrates the feasibility of the Smart Identity as it is defined in ETSI TR 103 875-1 [i.1].

It defines, for a specific use case (e-health), the Smart Identity (ID) and provides an associated Proof of Concept (PoC).

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 are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI TR 103 875-1: "User Centric Approach in Digital Ecosystem; The Smart Interface; Part 1: Smart Identity: user digital clone".

[i.2] Workbook N°1: "Digital identities". Personal Information Values and Policies Chair. Mines Telecom Institut.

[i.3] IEEE 802.11™: "IEEE Standard for Information Technology -- Telecommunications and Information Exchange between Systems -- Local and Metropolitan Area Networks -- Specific Requirements -- Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the following terms apply:

deep learning: type of artificial intelligence where the machine is able to learn by itself (unlike execute rules predetermined)

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AI	Artificial Intelligence
API	Application Programming Interface

DB	Database
DNA	DeoxyriboNucleic Acid
IBAN	International Bank Account Number
ID	Identity
ML	Model Language
PoC	Proof of Concept
UML	Unified Modeling Language
XNLI	Cross-lingual Natural Language Inference

4 Smart Identity: from definition to PoC design

4.1 Identity definition

The notion of identity is complex and polysemous. A definition is available in [i.2].

It depends on the point of view to consider what an individual can be, and on the use that the Smart ID want to make of this identity.

It is possible to identify 3 domains of identification which are cumulative:

1) Civil and legal identity

   This identity traditionally and mainly consists of the following elements:

   - surname, first name, gender, nationality, filiation (relationships), date and place of birth.

   This identity is deemed to be stable throughout life.

2) Biological identity: Height, weight, eye color, retina, fingerprint, DNA

   Some attributes of this identity can be used to formally identify a person, in addition to the civil identity.

3) Social and personal identity

   It is made up of many sociological and psychological elements: place of residence, profession, standard of living, hobbies, tastes, friends, beliefs, commitments, etc.

   It is built, it evolves and is enriched during life, it is never fixed.

These are identities that can be described as objective or suffered (civil, legal, biological). But there are also subjective and desired identities, corresponding to the way an individual decides for themselves how they intend to present themselves to others. It is a kind of narrative identity. Social networks and the use of pseudonyms and avatars in cyberspace are a tangible manifestation of this. It can be noted in this regard that in the digital world it is possible to have several identities.

The Smart ID is created with:

- The attributes of the objective identity of the person.
- The available resources (equipment, services).

It considers the sequence of the user roles in space-time: objectives, activities, tasks, schedule.

It takes care of the information used to make awareness choices.

More simply, the Smart ID is thus the representation of a person:

- What the user is
- What the user has
- What the user is doing

- What is the user's knowledge

4.2 From Identity to User Profile

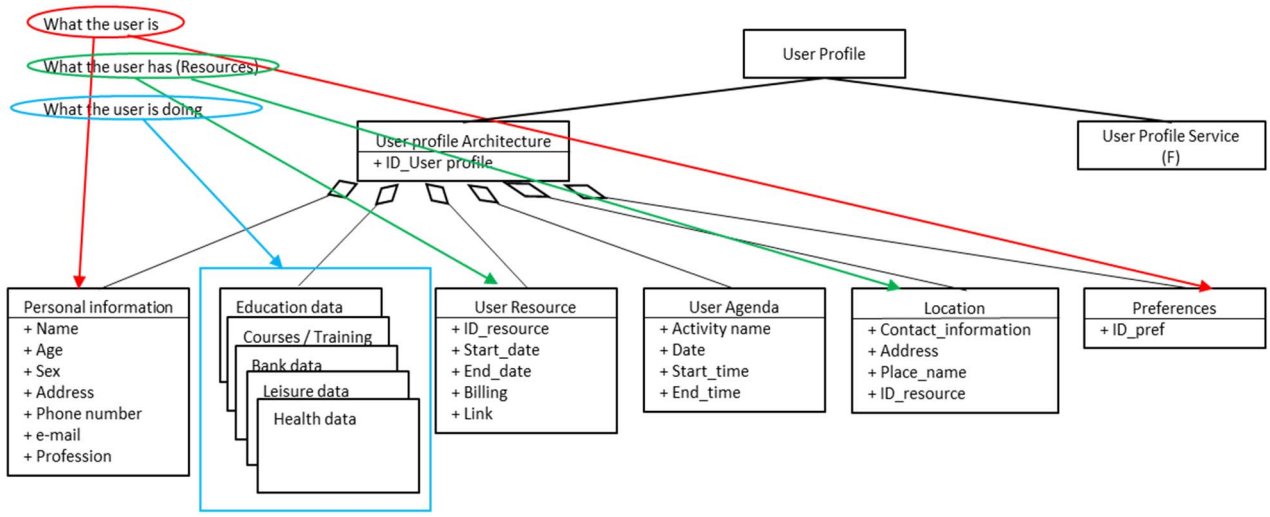

Figure 1: Relationship between Identity definition and user profile model

The "user profile" is therefore the informational representation of the user's identity (figure 1) in the digital ecosystem, including:

- Personal information:
  - Legal identity
  - Identifications
  - Roles (worker, patient, parent, benevolent, etc.)
- User centric characteristics that impact configurations:
  Actions according to:
  - Preferences
  - Space-time (agenda)
  - Location
- The resource description according to the location:
  - Internal resources (equipment, network, services)
  - External resources (equipment, network, services)

More precisely the personal sheet/template (figure 2) identity can be as following:

PERSONAL INFORMATION
Social ID
Social ID
Last Name
First name(s)
Gender
Date of birth
Country of birth
City of birth
Country of birth
Nationality (s)
Profession
Personal contact information
Address
Postcode
Town or city
Country
Mobile phone (s)/landline (s)
E-mail address (es)
Professional contact information
Business address
Postcode
Town or city
Country
Mobile phone(s)/landline(s)
E-mail address(es)
Other
Residence permit
Visa
Passport
Identity Card
Licences (e.g. Driving licence)

Figure 2: Personal information template

Moreover, with the evolution of paradigms, the **relationship** between the user and the system is now an **N to N** relationship meaning that the user has N profiles according to the role (figure 3).

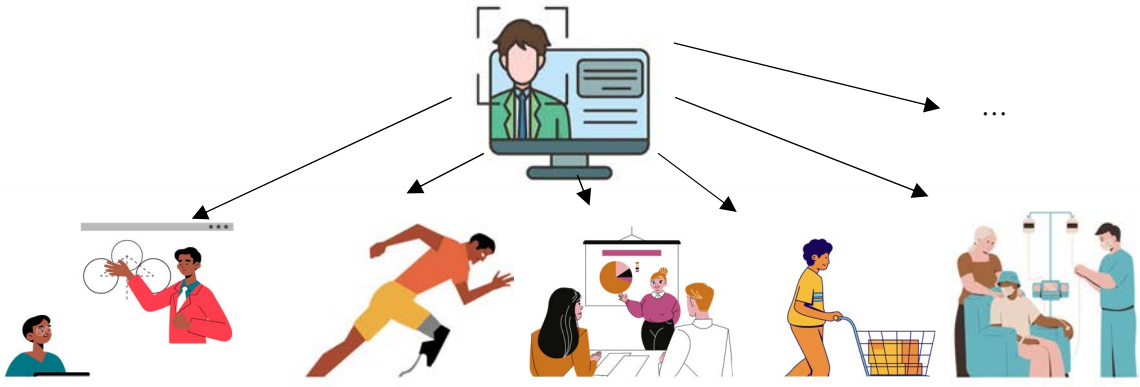

Figure 3: N user potentials roles

The instantiation of the User Profile model will give the complete picture of the user according to their roles in space-time, preferences, and location.

4.3 Knowledge base for Smart Identity: Potential profile

The user identity also takes care of "what the user knows".

This is why the knowledge base also includes the characteristics of the different fields of activity known to the user. This is why, it will be said that he acts in all awareness.

What user knows: potential profile (information allowing choice to be made awareness).

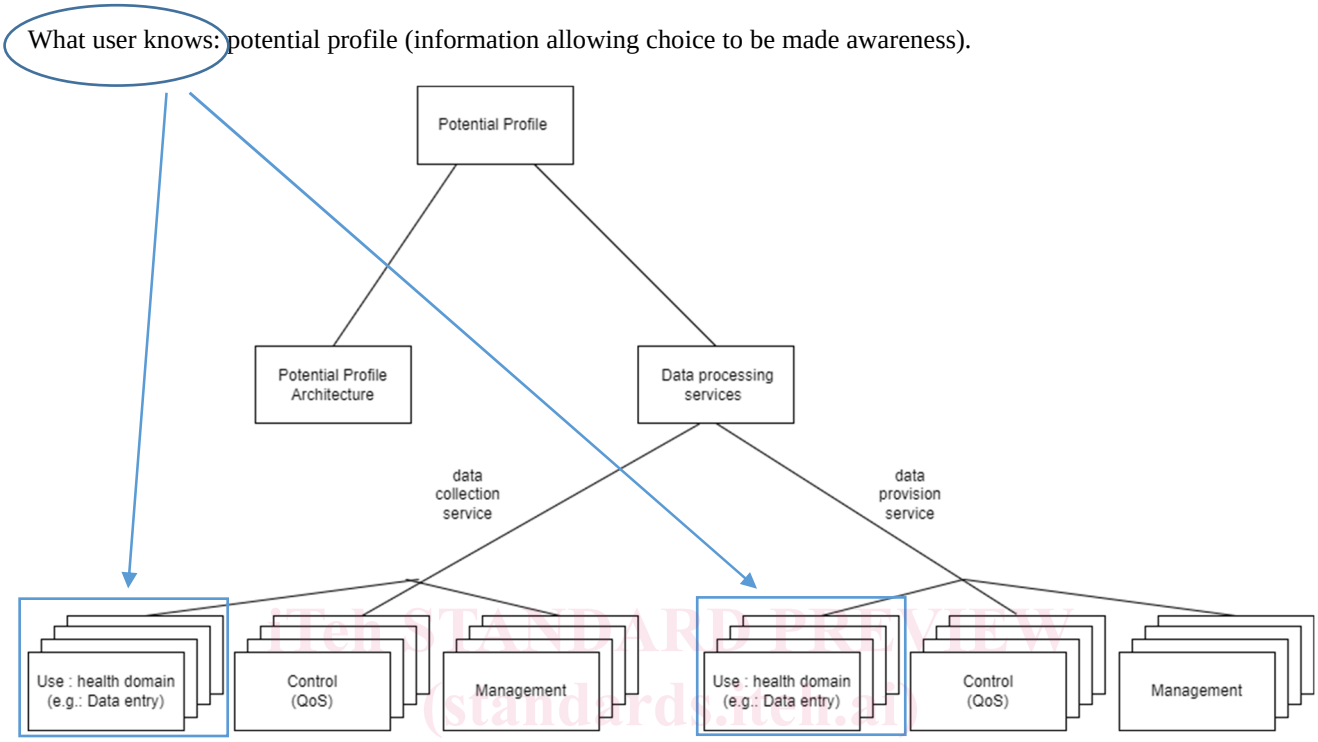

Figure 4: Knowledge base

Like any entity, the Potential Profile has an architecture and a service interface.

The first service consists of data collection (instantiation of the Potential Profile model) to store architecture information. The architecture of the Potential Profile enriches the architecture of the User Profile by informing all the areas relating to a temporal action.

The second service will be all the processing on data analysis in order to have additional decision-making information.

Each role played by the user requires data from each of the domains. That is, for each action the Smart ID needs cross-sectional data (figure 4). For example, when the user has a medical appointment, the profile will need the health domain and the finance domain, as with all actions that require payment.

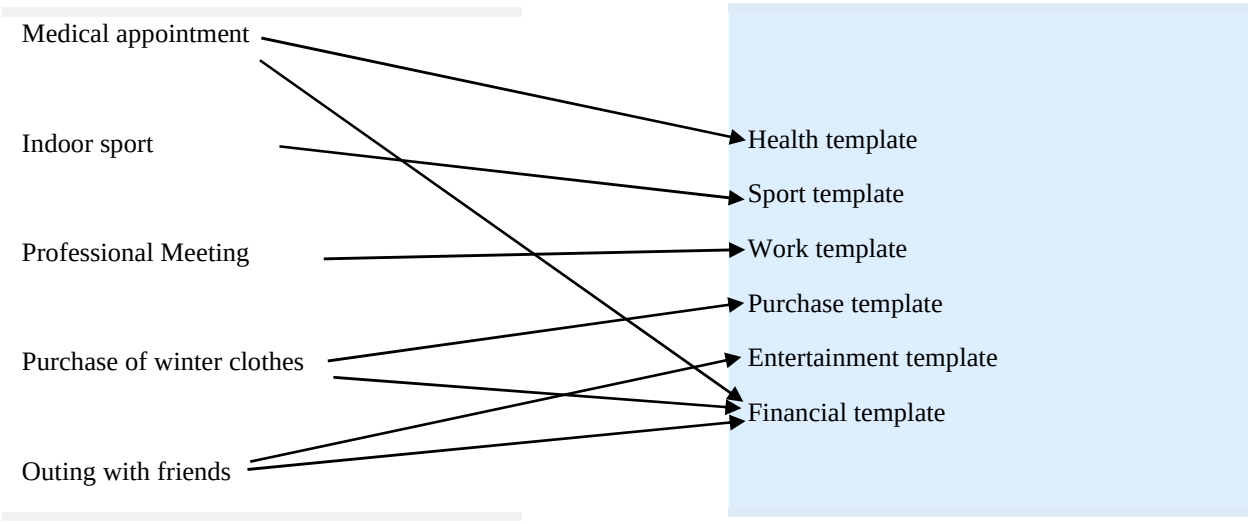

Figure 5: Example of transversal data

For the PoC it will need templates corresponding to the most common roles, that is to say the basic roles (figure 5) involved in areas such as health, work, finance, travel, etc.

HEALTH TEMPLATE
Social security number
Mutual insurance (personal, professional, etc.)
Health information
General information
Weight
Height
Health parameters
Temperature
Pulse/heart rate
Oxygen saturation
Respiratory rate
Blood pressure
Medical record
Blood type
Rhesus
Vaccination booklet
Vaccination certificates (covid-19)
Current treatment(s)
Allergies
Last tests
Latest prescriptions
Medical appointments (past and future)
Doctor notes
Emergency contacts

TEMPLATE SPORT (well-being)
Membership card
Information
User behaviours
Time spent sleeping/in bed
Inactivity time
Number of steps
Distance (walking and running)
Stages climbed
Stability of walking
Other
Calories
Information sheet
Type of subscription (classic, premium)
Duration of subscription
Wellness goal(s)

TEMPLATE TRAVEL
Information
Tickets/tickets for transport
Ticketing
Flight/train/bus tickets
Advantage/discount card
Carpooling information
Name and contact of the driver
Departure time
Meeting point (departure)
Arrival point
Stay
Hotel/accommodation reservation

TEMPLATE WORK
Registration number
Access badge
Tickets/restaurant card
Professional file
Job function
Office
Department/service
Other
Employment contract/internship agreement
Pay slips

TEMPLATE EDUCATION
Personnel number
Student number
Education card
Student information
Education
Timetable
Teaching units
Documents
Graduations

TEMPLATE SHOPPING/PURCHASES
Information
Item preferences
Product size
Customer record by supplier
Customer number
Membership/loyalty card
Username
Gift card
Discount coupons
Ordering
Points
My addresses (delivery and billing)
My payment methods (credit card, multiple payments, etc.)

TEMPLATE DOMOTIC
Access card/key
Charges
Energy supplier
Hot and cold water
Heating
Maintenance costs
Green space
Common areas
Household waste collection tax
Connected house
Management of: security, access, lighting, temperature, fans, objects, etc.
Other
Lease agreement/certificate of residence