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| ToR STF 626 (Ref. Body USER ) |
| *Version: 0.7* |
| *Author: USER group members* |
| *Last updated by: ETSI Secretariat – Date:* 2021-10-25 |
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Terms of Reference – Specialist Task Force Proposal

STF 626 (Ref. Body USER)

Smart Identity for Smart interface in digital ecosystem

Summary information

|  |  |  |  |
| --- | --- | --- | --- |
| Approval status | Approved by Ref. Body USER (21) 000016r2 | | **YES** |
| To be approved by Board#134 (21-23 September 2021) | | **YES** |
| Reference Body | SC User Group | | |
| ETSI Funding | **Maximum budget: 39 400 €** | | |
| Minimum of 4 ETSI Members Support | **YES** | | |
| Time scale | **From** | 2022-01-15 | |
| **To** | 2023-02-28 | |
| Work Items | DTR/USER-0052: Smart Interface : User digital clone  DTR/USER-053: Smart Interface; Proof of Concept | | |
| Board priority | [ETSI STF funding criteria](https://portal.etsi.org/STF/STFs/Funding/ETSIbudget.aspx)   |  |  | | --- | --- | | **Priority Criteria** |  | | Maintenance of standards in mature domains |  | | Innovation in mature domains |  | | Emerging domains for ETSI | X | | Horizontal activities (quality, security, etc.) | X | | Societal good / environmental | X | | | |

Part I – STF Technical Proposal

# Rationale & Objectives

## Rationale

The digital ecosystem must embrace an end-to-end vision and an effective and efficient QoS.

We have shown the interest and importance of a "User Centric" approach (STF 543) because the user is at the center of this ecosystem. The keyword of digital transformation is automation, both on the Supplier side by targeting "zero Touch" orchestration and on the User side by targeting personalization with an "as a service" composition and an intelligent HMI (Human-Machine Interface) (**Error! Reference source not found.**).

To meet the challenge on the User side, we propose to turn to new techniques and, in particular to artificial intelligence (AI), because of its ability to take advantage of the promises of Big Data (in our case, on Smart Data) and Machine Learning (ML) which are essential for profiling the user.

In the user-centric model, the user forces the entire digital ecosystem to provide them with the services they choose, which they personalize, according to the paradigm "anywhere, anytime, anyhow, any-device, every service, everyone ".

A global approach to data management and the deployment of innovative algorithms requires adaptations at the level of the five ACIFO (Architecture, Communication, Information, Functionality, Organization) dimensions (see clause 4.1) to take account of dynamicity and to guarantee continuous interoperability. ACIFO: is a 5-dimension model, based on recommendations and common objectives for Users and Providers, giving the capability for the User to compose the needed services with a level of autonomy and control for the personalized composition of services. The 5-dimension model creates one unique and integrated solution.

At the same time, a user-centric approach requires that the adopted solutions respect their security, privacy and their freedom of choice and action at all times. It is about integrating these constraints into the very design of the system.

“Smart Interface Technical proposal” wishes to address these issues. This will be achieved by analyzing the selected use case and understanding what adaptations are needed, what components may be needed to support this, and doing a first proof of concept (PoC) (demonstrator) based on these initial results. ETSI Board reviewed the initial project and proposed to submit it to EC/EFTA funding. As the new process for the Commission is not in place for the time being, and to avoid too long delays for the full project, User Group has decided to submit this STF proposal, only on a primordial part of the full project.

## Objectives of the work to be executed

As the full project defined below is delayed due to the new process planned by the Commission, this STF aims to provide a progress on the Information model.

The purpose of this STF is to offer a solution based on "smart data". This data is independent of the applications, thus making it possible to contextualize the services offered to better meet the needs and expectations of the user.

A PoC would show how a knowledge base integrates learning to use.

This first work aims to define **a Smart Identity** in order to have sufficient knowledge for the user interface to anticipate and respond to the user's needs and expectations, with a more in-depth analysis of the digital ecosystem (Figure 1 shows the smart interface including the smart identity).

The final objective is also to analyze in depth and integrate the following properties and performance :

- **"Intelligent" interface** that will allow the user, in explicit or intuitive manner, to use service components meeting their expectations. This service composition can be triggered according to a cursor ranging from “a simple push button” to “a complete selection of components”.

- **"highly contextualized" personalization interface** that takes into account its location (house, office, car, etc.), its agenda, its profiles (parental, professional, citizen, etc.), its digital identities (depending on the service, channel, terminal, etc.) and its preferences (eco-responsible, cost, etc.). This concept of "personalization" will significantly help impaired people with temporary or permanent disabilities and older users by simplifying operations and usages.

- **Proactive interface** that will allow the user to manage their data by offering them a smart border between professional and private life with an isolation of contexts.

- **Interface with an integrated QoS** that will control the behavioral aspects. This is a significant challenge because simultaneously with its normal operational function the system must ensure its QoS (reliability, availability, delay and capacity) without forgetting resilience, security and confidentiality.

- **Agile interface** based on the user experience and which will make good use of emerging technologies (AI, Open Data, IoT, API, micro-service). With the help of sensors of all kinds, all users are actors in their own right.

Particular attention will be paid to identifying all actors and users with disabilities and older users and their specific needs, in order to ease the usage of terminals/applications/services, anywhere and at any time.



Figure 1: Background for Smart Interface Target

## Previous funded activities in the same domain

STF 543 has produced four documents (see clause 4.1) which define the concept of ‘User Centric approach in the digital ecosystem.

User Group has produced a Technical Report (TR 103 437) which is planned to be published soon.

## Market impact

This STF is part of the general framework of European digital objectives (the European Digital Strategy). In particular, the smart interface specification will participate to make a real difference to citizen’s daily life, by delivering an easy-to-use way to enjoy and benefit from plenty of useful digital services taking into account the usage and context, according to user’s preferences.

It will also contribute to fight against the digital exclusion because it is an assistive technology able to empowering people with disabilities and people with poor digital skill.

This STF proposal is part of the NGN paradigm, which aim to make telecoms networks more agile and easily adaptable to the needs and expectations of users. It is important to add the smart interface to the different bricks of the network virtualization in order not to leave all the intelligence and management of digital services in the core network, and in the hands of suppliers alone.

The global impact and benefits can be expressed in 3 important points:

1. Increase business agility

The flexibility means to roll out new innovative services far easier and faster, while still delivering a consistently high-quality end user experience. This is beneficial for both suppliers and customers.

For the end-user it is important to be able to have quick access to a wide range of services and options, be able to simply switch from a private configuration to a professional one or even switch from one terminal to another in complete transparency. For business customer the aim is to allow them to pick and choose features for their networks, be it firewalls, network acceleration, load balancing or traffic visibility.

On a very competitive environment, the ability to provide a customer with a perfectly personalized service and to respond quickly to their wishes is a challenge in the market.

2. Improve service visibility, control and trust

Because trust will be the key to the acceptability of future innovations in the digital field, the "smart interface" must have a positive impact on customer-supplier relations

Smart interface brings the benefits of service visibility, analytics and control through a smart dashboard. It assesses real-time information and management to the customer. It is important to let them decide the level of automation, i.e. contextualization that he needs.

3. Positive economic impact

The European ambition is to become an attractive, secure, and dynamic data economy. A fair and competitive digital economy requires open and well-defined interfaces between services and consumers to ensure free choice of user and the compliance with of the net neutrality rule. It is very important to define without delay a generic framework for a smart interface open for all market players to avoid the risks of customer capture by practices of verticalization of a set of services within a package offer, more attractive as they would be more easily accessible than others.

With the regularity requirements that companies have to comply under the GDPR, the ePrivacy Act, the EU Cybersecurity Act and if they offer services in parts of the USA under the California Consumer Privacy Act it is vital that ETSI provide good supporting guides and information to business so that they may protect their customers data and ensure that those customers have a degree of control over how that data is used. The consequences of businesses of not complying with these acts could result for examples under GDPR fines of up to a fine up to €20 million or up to 4% of annular worldwide turnover or whichever is greater. Since this proposed Technical Report will examine user interaction with services providing guidance about data protection, control and access for both the user and service provider is vital.

## Consequences if not agreed

The « user-centric approach in digital ecosystem » should not be finalized and in particular, if the final brick will be missing, reducing the opportunity to implement these new approaches, needed for the best experience for the end-User.

ETSI Board proposed to submit the final step of the project for EC/EFTA funding. This has been done but the process is delayed by more than one year and User Group has decided to make progress on an important brick of the final project and to submit this task for ETSI STF call.

The STF is also intended to provide the AI link until the User. If the STF is not agreed this link will not made available.

Indeed, we propose, thanks to AI, to introduce what is making the difference between knowledge and information. That means to have the necessary dynamicity to have and use timely the information. We also take benefits of the more recent innovation and research on neurosciences and neuroergonomics.

Currently, the user group can only count on the voluntary efforts of its members. The subject requires specific funding. It is important that the proposed approach is addressed and implemented to help companies achieve their end-to-end digital transformation.

ETSI, through STF 543 and activities of User Group, is in a leading position on the « user centric approach » and this STF should reinforce this leading position in the standardization environment.

# Relation with ETSI strategy and priorities

|  |  |
| --- | --- |
| **Priority Criteria** | **Rationale** |
| Maintenance of standards in mature domains |  |
| Innovation in mature domains |  |
| Emerging domains for ETSI | “User Centric approach is a new topic, which has a great potential for the future “user Centric approach”. This STF gives the opportunity to transfer the results of researches to the “real life”, for the benefit of users and a new approach for the suppliers. |
| Horizontal activities (quality, security, etc.) | The STF will deal with the QoS, the security, data protections, as offered to the users |
| Societal good / environmental | The STF will take into account good practices in terms of ethics and good use of AI and contextual data, in particular by always having the concern of placing the user at the centre of the ecosystem |

# ETSI Members Support

|  |  |  |
| --- | --- | --- |
| **#** | **ETSI Member** | **Supporting delegate** |
| 1 | AFUTT | Pierre Yves Hébert |
| 2 | Institut Mines Telecom | Tatiana Aubonnet |
| 3 | Cadzow Communications | Alex Cadzow |
| 4 | ANEC | John Ketchell |

# Deliverables

## Base documents

Four documents have been produced by STF 543 and the fifth (TR 103 437) has been produced by User Group members.

In a previous STF 360, documents provided an initial input to this project

|  |  |  |
| --- | --- | --- |
| **Document** | **Title** | **Status** |
| ETSI TR 103 438 | User Group; User centric approach in Digital Ecosystem | Published |
| ETSI EG 203 602 | User Group; User Centric Approach: Guidance for users; Best practices to interact in the Digital Ecosystem | Published |
| ETSI TR 103 603 | User Group; User Centric Approach; Guidance for providers and standardization makers | Published |
| ETSI TR 103 604 | User Group; User centric approach; Qualification of the interaction with the digital ecosystem | Published |
| ETSI TR 103 437 | Quality of ICT services;  New QoS approach in a digital ecosystem | Published |

The 5-dimension model ACIFO defined in the different publications is based on 5 sub-models (see below). The present STF addresses the Information Model:

* Architectural Model "Acifo": defines the global structure, including semantics and is optimized for the stated objectives.
* Communication (Relational) Model aCifo: defines the exchange protocols, including HMIs (User) and APIs (provider) exchange and management protocols over three planes: (1) Management (Monitoring), (2) Control, and (3) Usage.
* **Information Model acIfo: defines the different Profiles (User, device, service). The information covers the whole ecosystem (equipment, network, applications, services, HMIs, User, etc.) from the offer to the resource's availability for Users, Providers and any other partners.**

**With the introduction of artificial intelligence (AI), the information model is enriched with additional data, collected every day and which will refine the user's knowledge (for example data from sensors, connected objects in their environment, ... ). It is this learning that will provide a better understanding of the needs and a contextualization of the compound services.**

* Functional Model aciFo: defines services and service composition. The functionalities (the process) to compose any service based on "micro-service".
* Organization Model acifO: defines the role of any actor and which actor is responsible of each action. ("Who is doing what?").

## New deliverables

|  |  |  |  |
| --- | --- | --- | --- |
| **Deliv.** | **Work Item code**  **Standard number** | **Working title**  **Scope** | **Expected date for publication** |
| D1 | DTR/USER-0052 | Working title: Smart Interface: User digital clone  Scope: Analysis of the user requirements, the study of new technologies contribution, and digital clone definition. | August 2022 |
| D2 | DTR/USER-0053 | Working title: Smart interface for digital ecosystem: A Proof of Concept | February 2023 |

# Maximum budget

## Task summary/Manpower Budget

|  |  |
| --- | --- |
| **Task short description** | Budget (EUR) |
|
| T1 Project Management | 3 000 |
| T2 Analysis of the ID information needed from the user profile | 9 000 |
| T3 Definition of the ID information model | 13 000 |
| T4 PoC | 12 00 |
| **TOTAL** | 37 000 |

## Travel budget

Total Travel budget: 2 400€

The STF Leader will join physically Three User Group Meetings 3 \* 800 € = 2 400€

Part II – Details on STF Technical Proposal

# Tasks, Technical Bodies and other stakeholders

## Organization of the work

The STF will be under the responsibility of SC USER. A Steering Group (SG) will be formed comprising members of ETSI SC USER and stakeholders from the organisations mentioned in section 3 of this proposal. The SG will be set up and jointly led by the chair and the vice-chair of SC USER.

The STF will provide regular reports to the Steering Group. G2M will be held when appropriate. Face-to-face meetings will occur in connection with the relevant SC meetings and Working Group meetings.

## Tasks for which the STF support is necessary

The proposed work will be based first on the results of STF 543 where, starting from the analysis of relevant use cases of the digital ecosystem, we have defined an architectural model by placing the user at the centre of the system (User Centric). New techniques such as AI, ML and Big Data statistics allow automation that is vital to succeed in this digital transformation and adaptation.

In an end-to-end vision, the user also needs autonomy empowerment and to benefit from the contributions of these new techniques.

This is why it is necessary to define the last link in the chain, the HMI, a smart interface to aim for an implementation, a "zero touch" end-to-end orchestration.

We also need a PoC not only to show the feasibility of this smart interface, but also to show the positioning and postures of the user.

This STF support so is necessary.

## Other interested ETSI Technical Bodies

Cyber Group: For text relating to data protection, privacy and cybersecurity if would be prudent to present this text to the Cyber Group at ETSI so may review and provide feedback and suggestion if they believe any key points have been missed.

Human Factors Group: As this report examines human-computer interaction if would be useful to send at various stages drafts of this report to HF to gather feedback through a review of the work in progress text. This would help ensure we are producing work that is useful for other groups and interested parties and will allow for comments and suggestion about potential topics or links could improve to usefulness of the report.

The results of the STF should be taken into account in different ETSI TBs and ISG such as ATTM, NFV, CDM, CIM, eHealth and ENI and also projects such as IA.

## Other stakeholders

ITU-T, and in particular SGs dealing with QoS, Security, Artificial Intelligence, Identity (SGs 3 & 17) …

According to the comments from ETSI Board, the STF shall liaise with other standardization bodies involved in items such as “ID”, or will take care of progress in other bodies to avoid competitions or duplications of works. Among them, IETF SCIM Working Group, W3C DID, ISO/IEC JTC 1/SC 27/WG 5.

Part III: Execution of Work

# Work plan, time scale and resources

## Task description

**Task 1 – Project Management**

**Objectives:** Project Management

**Input:** STF Terms of Reference

**Output:** Professional project management and high quality of the results produced

**Resources required**

* good knowledge of relevant user centric approach;
* good experience of new services and architectures;
* good knowledge of software engineering.

**Task 2 – Analysis of the ID information needed from the user profile**

**Objectives:** Analysis of the user requirements, the study of new technologies contribution, and digital clone definition.

**Input:** ACIFO Model

**Output:** A part of Technical Report (D1): Smart Identity : User Digital Clone

**Resources required**

* good knowledge of relevant user centric approach;
* expert knowledge of AI and Smart Data techniques;
* Good knowledge of relevant User Security;
* Good knowledge of User Experience and User satisfaction

Task 3– Definition of the ID information model

Objectives :. Use cases and design a knowledge base (data set for the PoC).

Input: Task 2 report

Output: A part of Technical Report (D1): Smart Identity model for digital ecosystem

Resources required

* expert knowledge of relevant information model standards;
* good experience of AI and Smart Data technique;

**Task 4- PoC Implementation**

Objectives :. Use cases and realization of platform.

Input: Task 2 and Task3 reports

Output: A part of Technical Report (D2): Smart Identity : **Proof of Concept** (WI 053)

The main functionalities are the following : :

1. Discovery of user’s environment : available services subscriptions, connected objects, new services proposals (smart environment)
2. Recovery of contextualized information, from the knowledge base.
3. Recovery of learning information (AI)
4. Call to the services dynamic composition engine (cloud)
5. Making available services in the smartphone interface

Resources required

expert knowledge of AI, smart data techniques and components “as a service”, digital ecosystem, user centric approach.

expertise in programming and performance assessment

## Milestones

Milestone 0 is the start of the actual work of the Experts after the recruitment phase.

Milestone A Analysis of the user profile (expectations, needs, usages, privacy, security…). Inventory.

Milestone B Smart ID (acIfo model of the smart interface). Definition of the knowledge base.

Milestone C: Definition and design of PoC

Milestone D: Implementation of PoC

Milestones

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **M0** | Start of the actual work of the Experts after the recruitment phase | 15/01/2022 |
| **MA** | Analysis of the ID information from the user profile | 15/05/2022 |
| Reference Body Deliverable | D1: Early draft available for review |  |
| ETSI Deliverable | Progress Report#1 approved by Reference Body |  |
| **MB** | Definition of ID Information Model | 30/08/2022 |
| Reference Body Deliverable | Draft TR (D1-WI 052)  Publication of D1 |  |
| ETSI Deliverable | Progress Report#2 approved by Reference Body |  |
| **MC** | Definition and design of PoC  Early draft TR (D2-WI 053) | 15/10/2022 |
| ETSI Deliverable | Progress Report#3 approved by Reference Body |  |
| **MD** | Implementation of PoC | 15/01/2023 |
| Reference Body Deliverable | Draft TR (D2-WI 053) | 15/01/2023 |
| **ME** | Deliverable D2 published, Final Report  STF closed | 28/02/2023 |
| ETSI Deliverable | Final Report approved by Reference Body | 28/02/2023 |

## Task summary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **N** | **Task / Milestone** | Start date | **Target date** | **Cost (€)** |
| M0 | Start of work |  |  |  |
| **T1** | Project Management | *15/01/2022* | *15/02/2023* | 3 000 |
| **T2** | Analysis of the *ID information from the* user profile | *15/01/2022* | *15/05/2022* | 9 000 |
| MA | D1: Early draft available for review  Progress Report#1 approved by Reference Body |  | *15/05/2022* |  |
| T3 | Definition of the ID information Model | *15/02/2022* | 15/07/2022 | 13 000 |
| MB | Draft TR (D1-WI 052)  Publication of D1  Progress Report#2 approved by Reference Body |  | 30/08/2022 |  |
| T4 | T4.1 Definition and design of PoC | 15/06/2022 | 15/10/2022 | 6 000 |
| MC | Definition and design of PoC  Early draft TR (D2-WI 053) available  Progress Report#3 approved by Reference Body |  | 15/10/2022 |  |
|  | T4.2 Implementation of PoC | 15/09/2022 | 15/01/2023 | 6 000 |
| MD | Implementation of PoC  Draft TR (D2-WI 053) |  | 15/01/2023 |  |
| ME | Deliverable D2 published,  Final Report approved by Reference Body  STF closed |  | 28/02/2023 |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task/ Mil.** | **Description** | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** | **F** |
| T1 | Project Management |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T2 | Analysis of the *ID information from the* user profile |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Mil A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T3 | Definition of the ID information Model |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Mil B |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T4.1 | Definition and design of PoC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Mil C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T4.2 | Implementation of PoC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Mil D |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Mil E |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

# Expertise required

## Team structure

3 to 5 participants to ensure the following mix of competences:

|  |  |
| --- | --- |
| **Priority** | **Qualifications and competences** |
| High | good knowledge of relevant user centric approach |
| High | good knowledge of software engineering |
| High | expert knowledge of AI and Smart Data techniques |
| High | expert knowledge of components “as a service” and digital ecosystem |
| High | Good knowledge of User Experience and User satisfaction |
| High | Good knowledge of relevant User Security |

Part IV: STF performance evaluation criteria

# Performance Indicators

|  |  |
| --- | --- |
| **Select relevant Performance indicators applicable for these ToR (X)** | |
| Contribution from ETSI Members to STF work | |
| Direct financial contribution (co-funding) | X |
| Support to the STF work (e.g., provision of test–beds, organization of workshops, events) | A test platform |
| Steering Group meetings (number of meetings / participants / duration) | 4 meetings /  3 members /  G2M |
| Number of delegates directly involved in the review of the deliverables | 10 |
| Contributions/comments received from the Reference Bodies | 20 |
| Contributions/comments received from other Reference Bodies | 5 |
|  |  |
| **Contribution from the STF to ETSI work** | |
| Contributions to Reference Body meetings (number of documents / meetings / participants) | 12 |
| Contributions to other Reference Bodies | 5 |
| Presentations in workshops, conferences, stakeholder meetings | 2 |
|  |  |
| **Liaison with other stakeholders** | |
| Stakeholder participation in the project (category, business area) | Research, User associations, SMEs  In QoS, Security, … |
| Cooperation with other standardization bodies | Through liaison statements |
| Potential interest of new members to join ETSI | Any provider (and in particular SMEs) |
| Liaison to identify requirements and raise awareness on ETSI deliverables |  |
| Comments received on drafts (e.g. on WEB site, mailing lists, etc.) | Webpage,… |
|  |  |
| **Quality of deliverables** | |
| Approval of deliverables according to schedule | X |
| Respect of time scale, with reference to start/end dates in the approved ToR | X |
| Comments from Quality review by Reference Body | X |
| Comments from Quality review by ETSI Secretariat | X |

Time recording

For reporting purposes, the STF experts shall fill in the timesheet provided by ETSI with the days spent for the performance of the services

During the activity, the STF Leader shall collect the relevant information, as necessary to measure the performance indicators. The result will be presented in the Final Report.

# Document history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0.0 | 2021-07-15 | JYM |  | Discussion through a G2M (User Group) |
| 0.1 | 2021-07-20 | User Group Members |  |  |
| 0.2 | 2021-07-29 | User Group Members |  |  |
| 0.3 | 2021-08-03 | User Group Members |  | For approval by User Group |
| 0.4 | 2021-08-12 | User Group |  | Approved (Remote consensus) |
| 0.5 | 2021-08-24 | ETSI Secretariat |  | Update before Board#134 submission |
| 0.6 | 2021-10-08 | ETSI Secretariat |  | Update after Board#134 approval |
| 0.7 | 2021-10-25 | ETSI Secretariat |  | Update before CL publication |