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Foreword

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

Modal verbs terminology

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Introduction

The present document has been produced by the STF 543 experts.

The concept of the full Project is to define 5-dimension model called "**ACIFO"**. **The 5-dimension model is based on 5 sub-models defined as:**

- Architectural Model "**A**cifo": defines the global structure, including semantics and is optimized for the stated objectives.
- Communication (Relational) Model a**C**ifo: defines the exchange protocols, including HMIs (User) and APIs (provider) exchange and management protocols over three planes:
  - Management (Monitoring).
  - Control.
  - Usage.

- Information Model ac**I**fo: 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. It is a knowledge data base representing the whole ecosystem.

- Functional Model aci**F**o: defines services and service composition. The functionalities (the process) to compose any service based on "micro-service".

- Organization Model acif**O**: defines the role of any actor and which actor is responsible of each action. ("Who is doing what?").

These five dimensions should be shared by the user and the supplier/provider. For the user, it should be possible to define (or to choose) the level of autonomy and control for the personalized composition of services.

The four deliverables produced by STF 543 define the different dimensions:

- ETSI TR 103 438 [i.1] focuses on the Architecture and the Organization:
  It includes the use cases and the results of the survey.

- ETSI EG 203 602 [i.2] focuses on the information and the functionalities:
  It is dedicated to the user. It provides analysis and recommendations from the information and functionalities.

- ETSI TR 103 603 [i.3] addresses all the dimensions to the supplier, in order to produce the APIs according to the user expectations and whatever the number and types of additional suppliers.

- ETSI TR 103 604 (the present document) focuses on the communication and in particular on the HMIs.

For example, for Energy (production, distribution, consumption), the supplier will create an API for the user. The information will be exchanged between the supplier and the user but will not be used only by the supplier: the user will have access to all the information and will be able to use this information to optimize their energy consumption. This data base is a source to provide new services and new applications (for the user and for the supplier). One major challenge and constraint is to ensure that all the private data may be checked and monitored by the user (the contract needs to define clearly these points). The data are not used only by the supplier, the user should have access to the data and may refuse that the data be used or known → an interaction "cursor" between the user and the supplier defines the freedom (GDPR [i.4]).

1 Scope

The present document describes the service provision to be addressed by designers and implementers of the digital ecosystem to ensure that the means by which users interact with the digital ecosystem is consistent across device types, and meet the preferences of the user. The present document addresses the role of the user accessing services in the digital ecosystem with multiple formats of device.

For the purposes of the present document the digital ecosystem refers to those business sectors that interact with each other, and their consumers, using digital means. The application of the recommendations made in the present document encourage a unified approach across all elements of ecosystem that together impact the user experience (referred to as Quality of Experience) and aim to ensure continuity of customer experience across the entire eco-system. Specifically the present document identifies the elements of service interaction that should be made personal to the user.

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 103 438: "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] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).

[i.5] ETSI EN 301 549 (V2.1.2): "Accessibility requirements for ICT products and services".

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

blockchain: digital record of transactions, in which individual records, called blocks, are cryptographically linked together in single list

chatbot: robot able to speak and imitate human behaviour, whether written or spoken

choreography: scenario where each service knows a subset dependencies

orchestration: scenario where all global dependencies between services are known by at least one service

3.2 Symbols

Void.

3.3 Abbreviations

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

ACIFO	Architecture, Communication, Information, Functionality, Organization
AD	Advertisment
AI	Artificial Intelligence
API	Application Programming Interface
BPEL	Business Process Execution Language
BREAD	Browse, Read, Edit, Add, Delete
CRAP	Create, Replicate, Append, Process
CRUD	Create, Read, Update, Delete
DAVE	Delete, Add, View, Edit
DDS	Data Distribution Service
DNS-SD	Domain Name System-based Service Discovery
GDPR	General Data Protection Regulation
HMI	Human Machine Interface
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
ICT	Information & Communication Technology
IoT	Internet of Things
NSD	Network Service Discovery
QoE	Quality of Experience
QoS	Quality of Service
REST	Representational State Transfer
SCRUD	Search, Create, Read, Update, Delete
SMS	Short Message System
SOA	Service Oriented Architecture
SOAP	Simple Object Access Protocol
SQL	Structured Query Language
SSO	Single Sign On
STF	Special Task Force
UG	USER Group (ETSI Special Comittee)
UX	User eXperience
VoWi-Fi	Voice Over Wireless Fidelity
Wi-Fi	Wireless Fidelity
WSCI	Web Service Choreography Interface
WSDL	Web Service Description Language

4 User needs

4.1 Results of the survey

The initial survey is available as attachment to ETSI TR 103 438 [i.1] and the additional survey is available as attachment to ETSI EG 203 602 [i.2].

Initial survey has questioned user maturity, behaviour and expectations. In 2018 it appears that more than half of the panel struggle to configure their smartphones or internet boxes. This means that a lot of users do not know the potential settings and the way to change them. This reduces significantly the capacity for users to interact with equipment, applications or services. Even if the users are not willing to increase these interactions, it appears needed to reduce the complexity of settings and to offer a simplified set of actions.

Respectively 70 % and 79 % of users are able to configure Bluetooth and Wi-Fi on a smartphone and less than half of users know how to configure cellular networks when they are abroad. However, even if the configurations of Bluetooth and Wi-Fi may be done by most of the users, the combinations of different questions of the survey indicate that existing of future services (e.g.: VoWi-Fi) may be difficult to be used.

A lot of potential services in smart cities, at home, or during travels will be available for the users. However, the survey indicates that less than 40 % of respondents are able to easily set up these equipments and almost 30 % do not know. It also appears that, for the time being, a lot of users' answers "do not care" to the question "would you have connected sensors/things in your house?" This is particularly true for Voice assistant, but on the other hand, half of respondents have or wish to have "light control (smart energy)", "heating control (smart energy)" and "Access control and video monitoring".

It also appears that only 16 % of users change the parameters of personal smartphone several times a month and 34 % change less than once a year. Personal on-line accounts are little consulted both on fix and mobile subscription. It is assumed that users prefer to call the hot line instead of accessing the personal account page when a problem occurs. However, as most users have a package, the possibility to access options or customized services is very limited.

The survey indicates that 85 % of users are using security softwares on their personal computers and only 38 % on their mobile. This does not mean that they do not wish security, but it is assumed that they are confident in the tools provided by the vendors when they buy a personal computer and do not have perceived that a smartphone may also need security softwares as for personal computers. Similar disparity appears for AD blockers.

For other potential tools (device optimization, quality measurement, back up services), there are no differences between personal computers or smartphones, and the percentage of used tools is lower than for security.

Customer expectations about the missing setting today on a smartphone and what they would like in the future was collected by an open question in 4 categories:

- **Control:** Ability to manage the device or the subscription i.e. connection priority, control of applications in the background, battery life, etc.
- **Privacy:** Need of transparency and privacy mastery i.e. cookies control, localization control, hide the text of SMS received, etc.
- **Customization:** Need of more customization i.e. setting according to the location, smart synchronization, senior apps or parameters, etc.
- **User eXperience (UX):** Ergonomics and affordance i.e. clarity of menu, tree logic, technical vocabulary, more help notice or bubble information, etc.

Concerning the control by the user of the device location, there is a quasi-equal spread between the users who think that they can control, users thinking that they can control but do not find it easy, and users who do not think that the control is possible. But a large majority of users (87 %) would like to hide their locations (when they wish).

The respondents have been asked about the possibility to change remotely smartphone settings: 43 % think that they may change settings of their smartphone, whereas 61 % think that the providers have this possibility (several answers were possible). So, it can be assumed that there is a large range of "progress" for users to become mature actor.

A large majority of users would like to challenge their providers, on privacy respect, security level, quality or price. This expectation should be achieved as long as the evolution towards a user-centric approach could be implemented.

The final question of the initial survey gave the opportunity to users to express their views about digital future. One of the major challenge will be to ensure safety and individual privacy, as a majority of users express their doubt about this. They are more confident about the possibility to customize services and that services, equipments, etc., will be easiest to be used and more user friendly.

The additional survey, available as attachment to ETSI EG 203 602 [i.2], was focused on the user place in the new digital ecosystem and user expectations. The additional survey had the objectives to:

- better understand the consumer relationship with digital
- identify the main expectations and fears
- look at the confidence drivers
- collect reactions on the perspectives opened up by new technologies

The main concern for users about digital ecosystem is identity theft. This concern arrives clearly first (nearly 50 %). The second concern (20 %) is the loss of privacy due to the collection of data for commercial purposes without the knowledge of the surfer. The other concerns (10 %) are the loss of personal data, the loss of freedom to choose, and the collection data by governments.

Over 60 % of users consider good or rather good new technologies: "biometric access" and "electronic signature".

Conversely the "blockchain" and the use of "APIs" receive less than 50 % of positive opinions, but it can be seen that the level of knowledge about these two technologies is low (respectively 28 % and 23 % of no opinion).

The additional survey provides the following results.

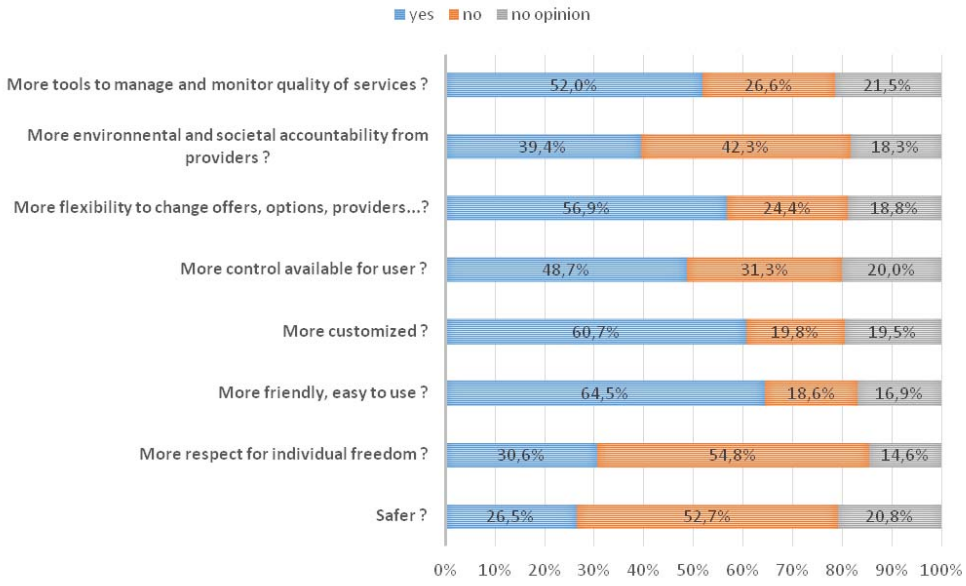

Figure 1: Results of the additional survey: user needs

4.2 Identification needs for the communication dimension

The consumers search for the desire services in a directory, even if the services are physically distributed over several platforms. Then the service consumers may call on these services. According to their wishes or needs the users need an interface (a language, a protocol, etc.) to design the dynamic composition of the services called on, in order to access the expected personalized service.

The present document considers the communication dimension of the digital ecosystem related to the user (the service consumer) and the service provider.

The service provider is responsible for creation of a service, to document the functional descriptions in the directory and to provide the interface.

Depending on the level of "freedom wanted by the user" (according to figure 2 Illustration of the user "cursor") the composition may be called on in an autonomous way (step by step) or globally (only the final result is provided to the user).

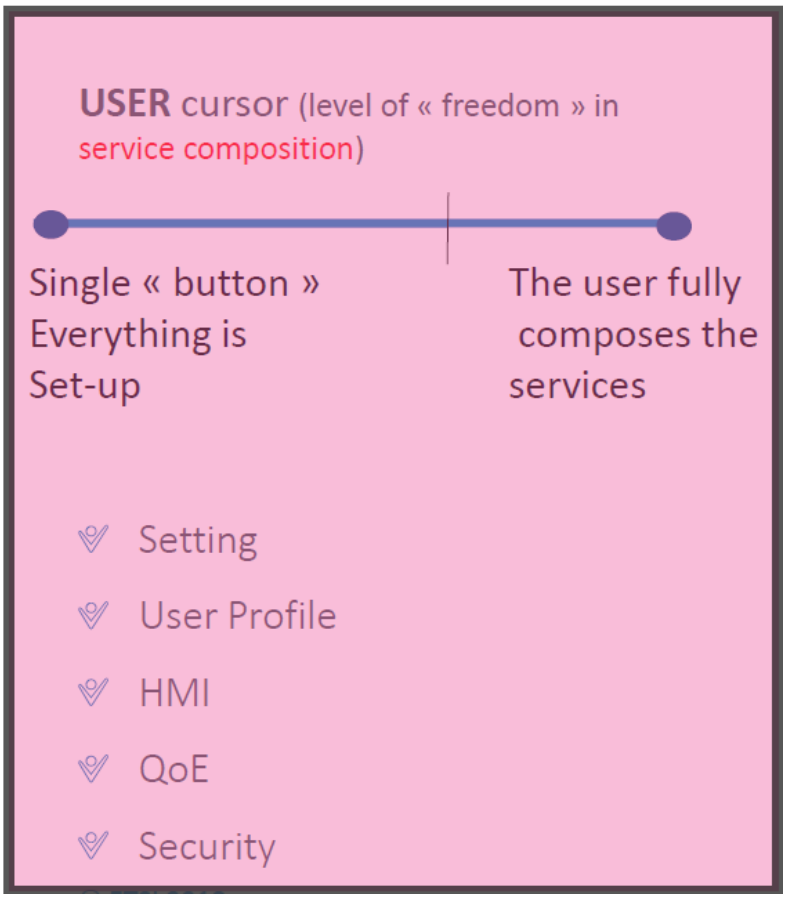

Figure 2: Illustration of the User "cursor"

5 State of the art

5.0 Introduction

The evolution of architectures introduces an evolution of the user interface and service interaction that structures the syntax but also the semantics of the digital ecosystem. The analysis of the state of the art made it possible to classify the current advances (see figure 3):

- Semantic Web: The Semantic Web infrastructure is sufficient for the simple interactions between a user and a web service. If a user involves the invocation of other web services, it is necessary to combine the web services features and to compose them (see clause 5.1).
- Artificial intelligence: Artificial Intelligence (AI) can assist users in dealing with service design with the positive impact on scalability and management of generic quality attributes discovering and composing services (see clause 5.2).
- Middleware approach focuses on the mechanism of service composition that allows applications to be adaptable and reconfigurable (see clause 5.3).
- Service-Oriented approach that may help to solve applications that are strongly coupled technically (protocol level) or functionally (semantic level) and services that cannot be reused or cannot be easily configured (see clause 5.4).

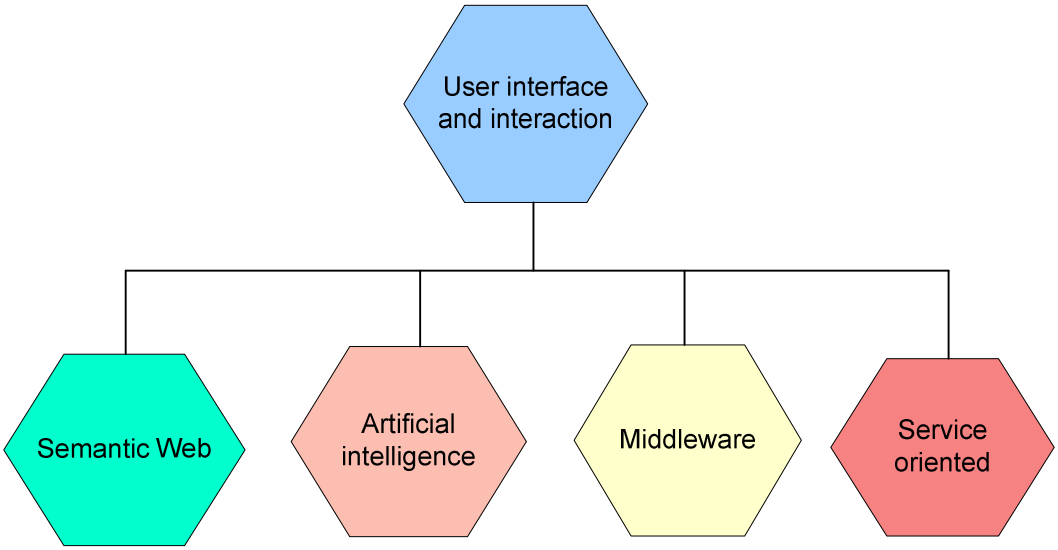

Figure 3: User interface and interaction

5.1 Web solutions

The Web Service is defined by the W3C as "a software system to support machine-to-machine interactions over a network". It is a computer program of the family of web technologies allowing the communication and exchange of data between applications and heterogeneous systems in distributed environments.

A Web Services is therefore invoked through its API which is accessible through a network, the invoked service is executed remotely on the server hosting the requested service. The interfaces are between the applicants and the service providers.

Web services expose their functionality as remote executable services. Their specifications are based on the SOAP (Simple Object Access Protocol)/WSDL (Web Service Description Language) standards. SOAP is a communication protocol for exchanging messages between different web applications and WSDL is the language that describes operations, messages, data types, and their location.

For resource features, Representational State Transfer, HTTP standards apply. HTTP is the interface to access and to manipulate resources through standardized operations (GET, POST, PUT, DELETE, TRACE, CONNECT).

For composition two modes are proposed:

- Orchestration: Business Process Execution Language (BPEL) All global dependencies between services are known by at least one service.
- Choreography: WSCI (Web Service Choreography Interface) each service knows a subset, dependencies.

5.2 Artificial Intelligence (AI) Solutions

AI aims at operating the semantic resources to produce flexible and adaptive-to-change web service compositions.

AI now takes the form of digital assistants, predictive or prescriptive models, and decision support systems based on algorithms that teach the machine to learn and reason from data. These data are massive and the knowledge needed to use the data is specialized.

On the user interface side, there are chatbots. The chatbot is a robot able to speak and imitate human behaviour, whether written or spoken. There are several interfaces: text messaging chatbots, and voice interfaces that allow humans to interact naturally with a machine.

5.3 Middleware solutions

The middleware refers to software components that help and simplify the design of new services. These components facilitate, for example, dynamic discovery, complex interactions, and so on. A logical bus is proposed for the exchange of messages.

There are also "Mashup" services that may combine content or services from several heterogeneous applications. For example, in a web page, the "mashup" aggregates contents from other sites to create a new site. The "mashup" principle is about how the interactive user participates, how the user wants to gather and group the invoked data.

5.4 Service-oriented solutions

Service-oriented solutions are associated with web services built with loose coupling and reuse to reduce the duplication of "Develop once, to reuse many" computing development and to increase agility in business processes by re-using "grain of service" in other ways.

A service is a business feature that:

- encapsulates treatments and data;
- exposes them through a standardized and referenced API interface.

An application programming interface (API) allows two applications (software programs) to communicate with each other. APIs are made up of two related elements. The first is a specification that describes how the information is exchanged between programs, done in the form of a request for processing and a return of the necessary data. The second is a software interface written to that specification and published for use.

To go from the expression of the needs to the call of service, the design will associate the CRUD type verbs with each resource.

CRUD (Create, Read, Update, Delete) includes basic features of user interface for most of the applications. As a bare minimum, the interface should allow the user to:

- **Create** or add new entries
- **Read**, retrieve, search, or view existing entries
- **Update** or edit existing entries
- **Delete**/deactivate/remove existing entries

The acronym CRUD refers to all the major functions that are implemented in relational database applications. Each letter in the acronym may map to a standard Structured Query Language (SQL) statement, Hypertext Transfer Protocol (HTTP) method (this is typically used to build RESTful APIs) or Data Distribution Service (DDS) operation.

These operations are so fundamental, they are often documented and described under one comprehensive heading, such as "contact management" and "content management".

CRUD data-based capabilities provide an environment for creating and customizing user applications.

SCRUD includes *Search* feature and allows the user to search entries according to user's needs and location.

The variations of CRUD include:

- BREAD (Browse, Read, Edit, Add, Delete)
- DAVE (Delete, Add, View, Edit)
- CRAP (Create, Replicate, Append, Process)

5.5 Conclusion for clause 5

It may be concluded in three points:

- First, are these solutions enough to meet the requirements of the digital ecosystem with the following properties: flexible, dynamic and sensitive to QoS/QoE?
- Then, the web and software designed information exchange via the internet and cloud computing adopted APIs and services. APIs have been improved over the last decade, and the growing number of web services exposed by APIs by cloud providers is also encouraging the creation of cloud-specific applications and to Internet of Things (IoT). The objectives are to improve access to data, to make it easier for customers and suppliers to interact with the company's information system, and to optimize the processing of transactions from internal or external sources.
- Finally the Artificial Intelligence should become the best customer interface to access and operate business data.

6 Qualification (expected features)

6.1 User expectations and requirements

Users should take advantage of service features through an open platform in order to enable the dynamic composition of services and to both respond to users' requirements and providers expectations.

The user-centric approach implies the adaptation to the context and the mobility for service composition. Users want an experience of ubiquitous services and of a service continuity during a session. Depending on service profiles, the platform could recall the most relevant service in terms of location (to ensure the context adaptation –ubiquitous-) and mobility depending on a service logic based on orchestration or choreography.

6.2 Features from the user side

The aim of the user interface design is to provide a user interface which provides easy to use, efficient and user friendly operation in order to produce the wished result. This means that the interface should provide a minimum of meaningful entries to obtain the desired result.

The user interface is the key element of the interaction of the digital ecosystem. The user interface offers a user interaction in the professional and private life, including habits and preferences.

It is why the proposed interface modelling and structuring are guided by the need to satisfy "anywhere, anytime" on one hand, and by the services architecture according to SOA (Service Oriented Architecture) on the other hand.

The needed features for the user interface representation in a generic and operational manner are:

- **Service discovery:** the services accessible to the user. E.g. offered services depending on the user location, profiles, etc.
- **Select:** it includes the different user choices depending on location parameters and preferences.
- **Compose:** it permits a personalized service composition. The service composition should be obtained by a service combination from basic or composed services. This composition offers the possibility to create new services answering to the personalized needs of users with a service logic.

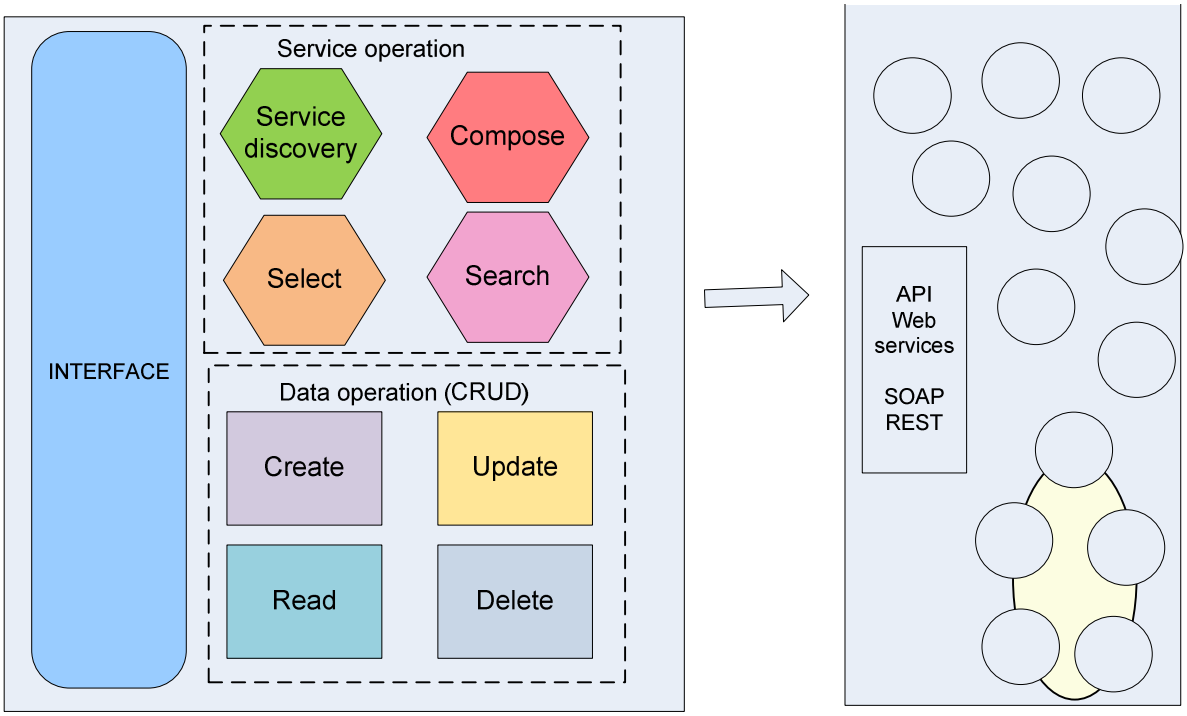

Figure 4: Interface profile

6.3 Features from the provider side

The digital change of companies is due to two major needs: to understand the capabilities of the digital ecosystem and to generate value through data. To meet these requirements, companies need to have agile Information Service.

To reach this goal it should be relevant to integrate solutions as described in clause 6.2 (Artificial Intelligence, middleware and oriented-services) and to have platforms "as a service" (PaaS) which should provide all the needs.

The user interface, offering data flow composition and operation to interconnect multiple information sources and different systems, should be on the provider side (Cloud):

- To offer cloud services
- To manage user interface
- To manage user data
- To ensure data protection
- To operate the intake of AI for the decision making
- To manage the data from IoT
- To unify the exchange oversight

- To offer and manage APIs
- To reduce the time-to-market of web applications, mobiles and IoT

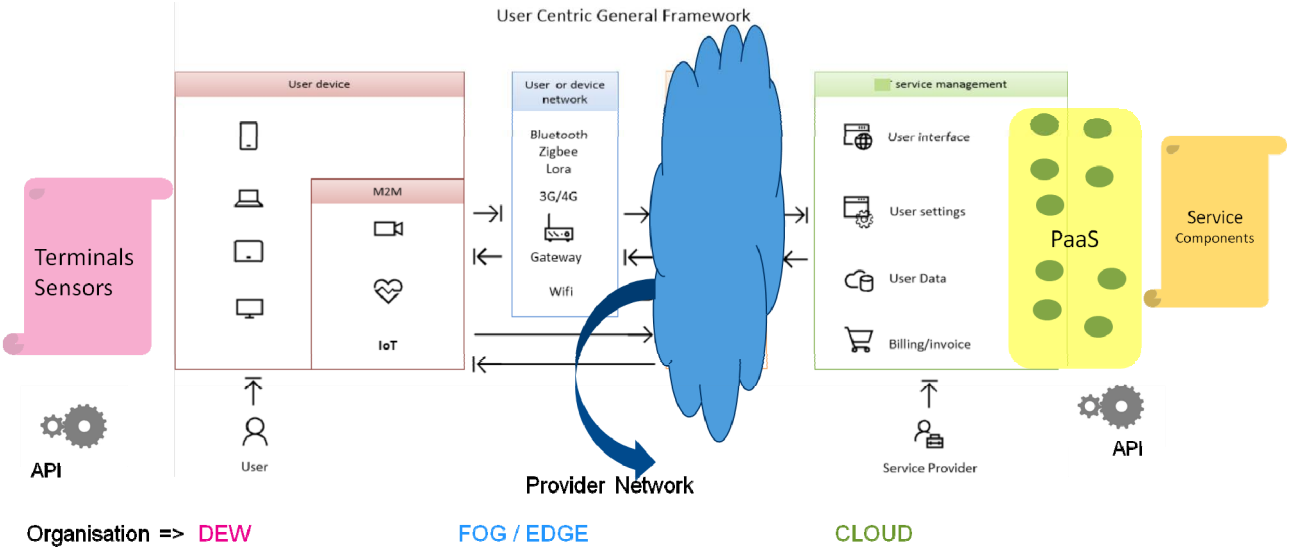

Figure 5: The Generic Model

API defines the independent features of their implementations and eases the composition development. It includes metadata, links and constraints such as:

- Change of interface, taken into account by programming
- Adaptable contract
- Loose coupling and semantic interoperability
- Possible automation
- Controlled visibility
- Enhanced user behaviour knowledge

As a conclusion, with all these features the user takes benefits from the best of innovations, is released from technical constraints providing a better experience (richer and more intuitive).

6.4 Security interaction

6.4.1 Data Protection

Data protection and safety is vital for a company if they regularly process personal data. It requires them to have the means to protect data throughout its useful life. From the moment it is first created, processed, stored and destroyed. This means protecting data in transit, at rest, when on mobile or portable devices and finally the means to carry out secure disposal. The four main methods that companies and users require to assure data protection is effective are data backups, encryption, pseudonymization and access controls.

6.4.2 Privacy

Privacy can be defined as freedom from damaging publicity, public scrutiny, surveillance, or unauthorized disclosure of one's personal data or information, as by a government, corporation, or an individual. Privacy in the context of online and connected services means the privacy and security level of personal data published via the Internet or held by a company. It is a broad term that refers to a variety of factors, techniques and technologies used to protect sensitive and private data, communications, and preferences. Online privacy and anonymity are paramount to users as shown by conducted surveys. Privacy is linked to the confidentially of personal data between the user and the service provider.

The user expects confidentially to mean having another's trust or confidence when entrusting companies with private information.

6.4.3 Single Sign On (SSO)

Single Sign On (SSO) is an authentication process that allows a user to access multiple applications or services with one set of login credentials. The SSO authenticates the end user for all the applications and services the user has been given rights to and eliminates further prompts when the user switches applications or services during the same session. In a basic web SSO service, an agent module on the application server retrieves the specific authentication credentials for an individual user from a dedicated SSO policy server, while authenticating the user against a user repository such as a lightweight directory access protocol directory. SSO services involve communications between the user, an identity provider that maintains a user directory, and a service provider. When a user attempts to access an application from the service provider, the service provider will send a request to the identity provider for authentication. The service provider will then verify the authentication and log the user in. The user will not have to log in again for the rest of the session.

SSO enables composition of services for providers by automating or simplifying the user access or login process. For example, if a company provides multiply services once a user has logged into one service a multi-use token is generated which when the user switches to other services the company provides, they are able to access them without having to re-enter details because the multi-use token is used to authentic the user automatically. As a security measure the token has either a set number of uses or a time limit before a new token has to be generated with the user re-entering their login details.

Although SSO is a convenience to users, it presents risks to cybersecurity. An attacker who gains control over a user's SSO credentials will be granted access to every application or service the user has rights to, increasing the amount of potential damage. In order to avoid malicious access, it is essential that every aspect of SSO implementation be coupled with identity governance. Providers can also use two-factor authentication or multifactor authentication with SSO to improve security.

To get further than just the SSO service user expects a broader solution, based on a single digital identity platform, including some additional personal data in order to perform all their administrative transactions (register births, deaths, pay taxes, run a business, buy and sell property, sue, vote, etc.).

That means a digital identity service with high probative value based on an official platform, associated with an electronic card on the user side.

There are already such services in Northern Europe (Estonia and Norway) where all public services are online, accessible with a secure and unique identity to perform acts of the social life in a very simply way and from everywhere.

The Surveys (see ETSI TR 103 438 [i.1] and ETSI EG 203 602 [i.2] show that people think that biometric technologies could simplify and secure access to digital services. Some biological data (digital fingerprint, eye retina, etc.) used alone, do not say much about the social identity of the individual. Moreover it is difficult to achieve control without the knowledge of the person. It is obviously much more problematic with regard to facial recognition techniques which rightly do not provide the same level of social acceptability.

7 Service differentiation

In a near future, a possible scenario could be the following: A user buys an IoT device, brings it home and connects it to the home network.

The device detects the surrounding services and their features and is thus aware of its environment.

These services are able to assemble themselves to achieve a common goal according to quality of service (QoS) requirements and thus respond to a user need (Control the home temperature, close the window, call the emergency teams, etc.).

If some IoT devices/services are appearing or disappearing, the system is able to reassemble itself in order to do its work and to continue to respect the QoS requirements.

Each service has to broadcast their features (function, offered QoS) to the others.

This can be based on Network Service Discovery (NSD) protocol which can be extended.

NSD gives the IoT device application access to services that other devices provide on a local network. It is based on the Domain Name System-based Service Discovery (DNS-SD) mechanism, which allows the user's application to request services by specifying a type of service and the name of a device instance that provides the desired type of service.

With NSD, the User is able to identify other devices on the local network that support the services they need to connect to.

This is useful for assembling services.

In the following, a use case is presented in which a user searches for a print service on a local network.

Use Case: User interaction within multi-device environment

This use case shows a user interaction within multi-device environment.

It gives an application access to services that other devices provide on a local network.

It allows applications to request services by specifying a type of service and the name of a device instance that provides the desired type of service.

It allows users to identify other devices on the local network that support the services an application request. This is useful for a variety of peer-to-peer applications such as file sharing or multi-player gaming.

Devices supported include printers, webcams, HTTPS servers, and other mobile devices.

The key is service discovery. Applications need to listen to service broadcasts on the network to see what services are available and filter out anything the application cannot work with.

Note that the increasing number of devices make them difficult to assemble to achieve a common goal.

The nominal scenario is defined in ETSI TR 103 438 [i.1].

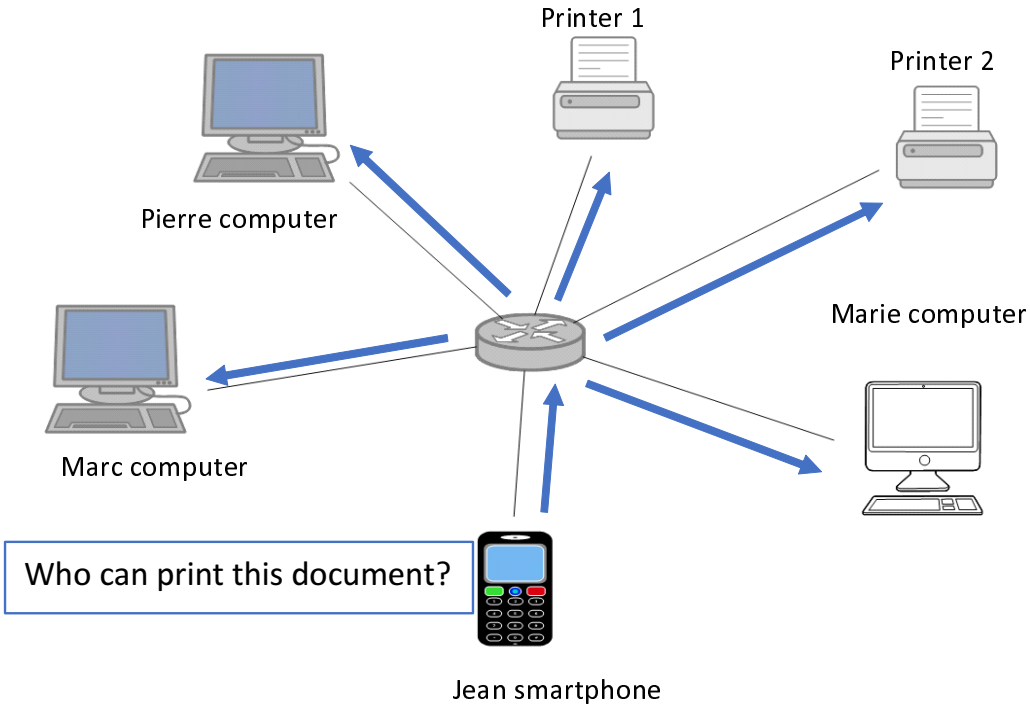

Figure 6: User interaction within multi-device environment

User needed resources:

- Internal and external network infrastructure.
- Connected devices.
- Composition of personalized services between the user and the device including the researched service.

Service discovery is the base for a personalized composition. Once the services are discovered, they can be assembled to form a composition. Assembly could be made automatically in a near future.

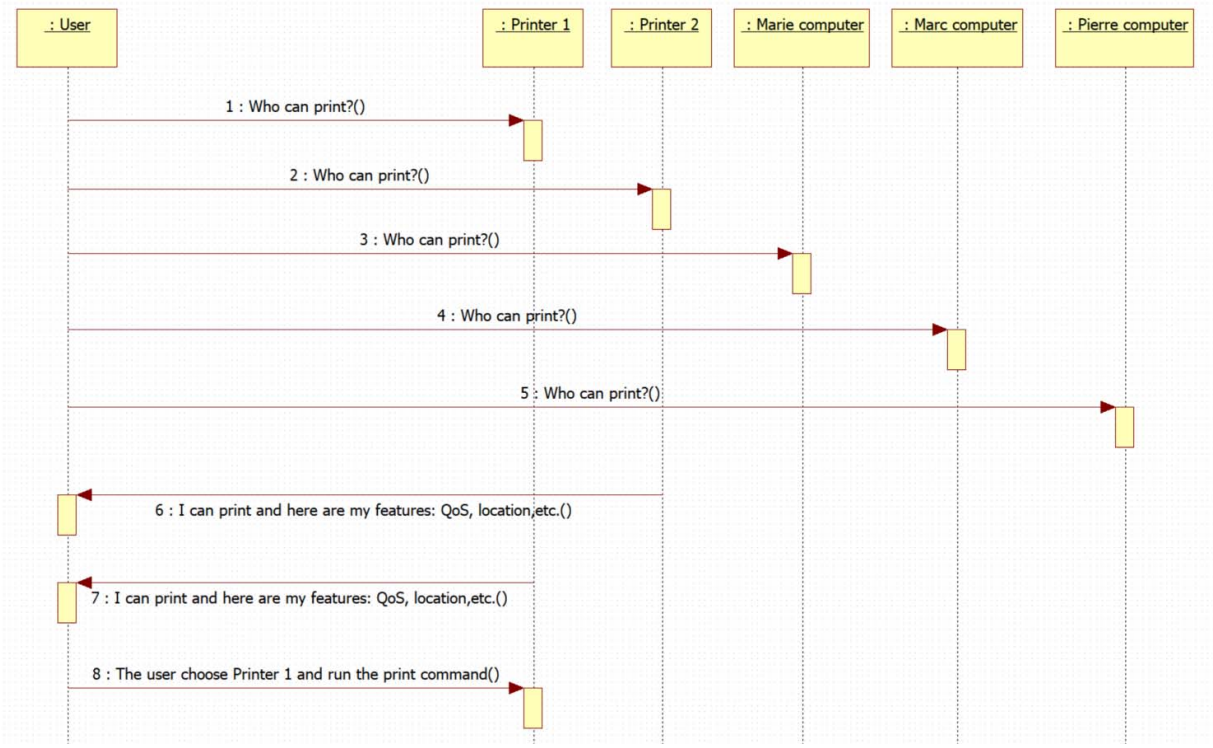

Figure 7: Sequence diagram

8 Assumptions about future smart interface

User interface in a digital ecosystem should become as intelligent as possible, to maximize intuitiveness of the user interface, which mean it is adaptive to the current user needs:

- To use machine learning and other AI technologies.
- To provide the whole user environment knowledge in order to contextualize the requirement. AI and big data should make it easier to reach this objective.
- To provide flexible services for the service composition in order to personalize services: micro-services will be the right way to achieve flexible services.
- To provide a more and more dynamic API in order to fit with user-centric behaviour.
- To provide process languages for a service logic based on loose links.
- To provide features such as CRUD for data processing.
- To provide automation process such as SaaS (Software as a Service) to be adapted to all the user profiles.
- To ensure that the smart interface provides accessibility features, when needed, according to ETSI EN 301 549 [i.5].

This smart interface should offer to the user a "digital twin" whatever the needed service.

Annex A:
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