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SERIES M: TELECOMMUNICATION MANAGEMENT, INCLUDING TMN AND NETWORK MAINTENANCE

Telecommunications management network

Principles for self-service management

Recommendation ITU-T M.3345

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Recommendation ITU-T M.3345

Principles for self-service management

Summary

Recommendation ITU-T M.3345 defines the requirements and a generic framework for self-service management. It provides a basic description of self-service management and its importance to service providers in NGN. This Recommendation also illustrates the benefits and application of self-service management.

Source

Recommendation ITU-T M.3345 was approved on 29 May 2009 by ITU-T Study Group 2 (2009-2012) under Recommendation ITU-T A.8 procedures.

Keywords

Customer, next generation network, self-service, self-service authorized user, self-service management, self-service manager, self-service management actor, self-service management interface, ssm reference point, user.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

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Introduction

In the telecommunications market, most service providers are facing a business transformation produced by the open-market transition initiatives of regulatory bodies, resulting in the need to lower their costs and increase their responsiveness to customers. Service providers need to:

– offer more flexible service choices to the customer/user;

– provide greater customer/user involvement in managing their service;

– increase the quality of interaction between the customer/user and the service provider;

– increase the service availability;

– provide customers/users with self-help in lifecycle operations of the service (i.e., from pre-order to decommissioning); and

– reduce the service provider's costs of operation.

Self-service capabilities offer reduced operation costs for service providers and enhanced quality of experience (QoE) to the customer. Self-service enables the service provider to maintain high service quality and lower operations cost. By empowering customer/user to manage his/her own services, the service provider drives up the QoE for the customer/user and enhances customer loyalty.

The purpose of this Recommendation is to define the self-service management requirements and provide a base self-service management implementation for all types of telecommunication services (traditional network and telecommunication, NGN, etc.). The self-service management is applicable to service provider, network operator, and content provider's operations support systems for the whole lifecycle processes. In this Recommendation, self-service can be applied to all phases of the service lifecycle from pre-order to termination and transition.

NOTE – Content providers also benefit from enhanced customer self-service experience. Customers may use self-service to browse, select and subscribe to content from product catalogues without involving directly the content provider.

Recommendation ITU-T M.3345

Principles for self-service management

1 Scope

This Recommendation defines the requirements, functional architecture and the concepts for self-service management.

The self-service management functions covered in this Recommendation include customer relationship management, fulfilment, assurance, and billing. The applicability of self-service management to drive strategy, infrastructure and product lifecycle management is considered for further study and outside the scope of this Recommendation.

2 References

None.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 B2B/C2B interface [b-ITU-T M.3060]: Synonymous to X interface.

3.1.2 b2b/c2b reference point [b-ITU-T M.3060]: Synonymous to x reference point.

3.1.3 business process [b-ITU-T M.3050.4]: Activity that a business can engage in (and for which it would generally want one or more partners).

3.1.4 content provider (CP) [b-ITU-T J.90]: The entity that provides the creative content of a programme (e.g., the programme producer or the owner of its rights).

3.1.5 customer: [b-ITU-T M.3050.1] The customer buys products and services from the service provider or enterprise, or receives free offers or services. A customer may be a person or a business.

3.1.6 enterprise [b-ITU-T M.3050.1]: Enterprise is used to refer to the overall business, corporation or firm, which is using the eTOM framework for modelling its business processes. The enterprise is responsible for delivering products and services to the customer. It is assumed that the enterprise is an information and communications service provider or consumer.

3.1.7 interface [b-ITU-T M.3010]: An architectural concept that provides interconnection between physical blocks at reference points.

3.1.8 managed resource [b-ITU-T M.3010]: The abstraction of those aspects of a telecommunication resource (logical of physical) required for telecommunications management.

3.1.9 management function [b-ITU-T M.3010]: The smallest part of a management service as perceived by the user of the service.

3.1.10 management service [b-ITU-T M.3010]: A management service is an offering fulfilling specific telecommunications management needs.

3.1.11 next generation networks management (NGNM) [b-ITU-T M.3060]: Planning, provisioning, installation, maintenance, operation and administration of next generation telecommunications equipment for transmission or control of resources and services within NGN transport and service strata.

3.1.12 operations system (OS) [b-ITU-T M.3010]: A physical block which performs operations systems functions.

3.1.13 product [b-ITU-T M.3050.1]: Product is what an entity (supplier) offers or provides to another entity (customer). Product may include service, processed material, software or hardware, or any combination thereof. A product may be tangible (e.g., goods) or intangible (e.g., concepts) or a combination thereof. However, a product ALWAYS includes a service component.

3.1.14 reference point [b-ITU-T M.3010]: An architectural concept used to delineate management function blocks and which defines a service boundary between two management function blocks.

3.1.15 service [b-ITU-T M.3050.1]: Services are developed by a service provider for sale within products. The same service may be included in multiple products, packaged differently, with different pricing, etc.

3.1.16 service provider (SP) [b-ITU-T M.3050.1]: A service provider enterprise that sells information and/or communications services to other parties.

3.1.17 telecommunications management network [b-ITU-T M.3010]: An architecture for management, including planning, provisioning, installation, maintenance, operation and administration of telecommunications equipment, networks and services.

3.1.18 user [b-ITU-T M.3050.1]: The user is the actual user of the products or services offered by the service provider or enterprise. The user consumes the product or service.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 authorization: It presents how, and under what conditions, self-service management actors can use self-service functions and what self-service actions they are permitted to perform.

3.2.2 self-service authorized user: The user of the self-service management service with authorization obtained from the self-service manager, limited to the use of Self-service management. The authorizations may be for services or content, provided independently of the service provider defined in the contract.

3.2.3 self-service management (SSM): The management service which supports management functions for telecommunication services or networks at an SSM actor's request.

3.2.4 self-service management actor (SSM actor): The user of self-service management who may be either a self-service manager or a self-service authorized user.

3.2.5 self-service management interface: An interface applied at the self-service management reference point, which provides connection and interaction between a self-service management actor and the self-service management function block defined in the SP's domain or OSS.

3.2.6 self-service manager: The user of the self-service management functions with the highest levels of authorization, which means that they can perform all contractually defined self-service actions between the service provider and the customer.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

B2B Business-to-Business

C2B Customer-to-Business

eTOM enhanced Telecom Operations Map

NGN Next Generation Networks

NGNM NGN Management

NO Network Operator

OS Operations System

OSS Operations Support System

PSTN Public Switched Telephone Network

QoE Quality of Experience

QoS Quality of Service

SC Service Customer

SLA Service Level Agreement

SMS Security Management System

SP Service Provider

SS Self-Service

SSM Self-Service Management

SSMA Self-Service Management Actor

SU Service User

TMF TeleManagement Forum

5 Introduction

5.1 General

Self-service in telecommunications is generally a new kind of service from both the customer's and user's perspective. This service provides new capabilities, features and benefits in service for the customer/user. By transferring management responsibility for the use of the service to the customer, self-service establishes a customer-facing interface for the service's OSS. The service provider benefits from reduced operational costs and a customer-perceived increase in ease of use and in the quality of service.

Self-service may be used differently by different customers: individuals, family members, enterprise authorized users, or other self-service users.

Self-service users may be either a manager within a customer organization, who manages the service directly, or other users authorized to manage some service instances. Users duly authorized to perform management operations on the service are SSM authorized users. Users who cannot change any aspect of the service are called SSM users. SSM users may only execute the functions enabled by the authorized users. Authorized users are not allowed to propagate authorizations.

Self-service management provides management functions for both the telecommunication network and services at a SSM actor's request and provides a more efficient interaction between SSM actors and service providers. As an example, interactions performed by the SSM actor include user initiated ordering, service inquiry, billing inquiry, trouble reporting, maintenance oversight and management, performance reporting and management, and network management for resource intensive services. The goal of SSM is to enable zero-touch interactions, where appropriate, and to facilitate multi-touch by the service provider, when needed. Zero touch means the execution of a user request to configure or re-configure a service without a human at the service provider helpdesk or provisioning group having to take any action. Zero touch means that a user orders, configures, and manages his/her service without the need to get another human involved in the process to manage the service.

5.1.1 Customer/user benefits

Some customer/user benefits from self-service are listed below:

- allows for self-configuration of:
  - service selection,
  - change of service parameters at the customer level, super-user level, or user level,
  - activation and deactivation of a service,
  - service restriction for authorization controls,
  - service termination;
- service and resource availability check;
- service notification, alarm, payment setting;
- trouble-shooting;
- support functions access;
- online ordering;
- online billing;
- customer/user experience report to the service provider;
- improved customer satisfaction;
- improved customer loyalty;
- shortened delivery time for provisioning;
- shortened outage period for repair;
- improved access to market and product/service information;
- improved interaction with the service provider and content provider;
- service specific help, independently of helpdesk functions.

5.1.2 Service provider benefits

Some of service provider benefits are listed below:

- enhanced capability to track customer/user experience of a service;
- ability to create a service customer/user profile, based on the customer/user actions, collected in a historical period of use;
- reduced maintenance cost;
- reduced operation cost;
- reduced marketing cost;
- ability to target marketing based on the customer/user history;

– ability to target marketing based on the geographic location and other demographics;
– ability to target trials based on customer/user history, or the geographic location or other demographics;
– improved user-perceived quality of service;
– provide new product/service easier;
– provide directed marketing and drive impulse buying;
– enhanced service rollout process;
– simplified business processes;
– retain service customer loyalty through enhancing the service customer QoE;
– shortened delivery time of fulfilment of telecom product/service;
– shortened time to resolve problems of customer service;
– improved publishing of marketing and promotion information through ancillary service product use;
– improved interaction with the customer/user;
– reduced workload on service customer resources;
– increased service provider's profit.

5.2 Basic function of self-service management

Self-service management has the following aspects:

– to manage SSM actor requests for fulfilment, assurance and billing;
– to enable a user-friendly way for the SSM actor, to use self-service management;
– to enable an efficient and user-friendly communication mechanism between the SSM actor and the service provider.

5.3 Other features

5.3.1 Online customer self-analysis

Service customers, like large enterprises and call-centres, are very sensitive to the telecom service they are using because the telecom service is one of the key factors that impact their business. Like call centres, the customers always need incoming-call analysis to measure and manage:

– resource usage and availability ration analysis;
– traffic flow analysis;
– total calls received per month or per day;
– ratio of calls lost or received;
– busy call time window;
– average lasting-time per call.

Under these situations, a SSM actor's service analysis will provide the features that the customers require to analyse the telecom service impacting their business. Key performance indicators are selected on a service-specific basis and are monitored to accurately reflect the impact of performance issues on the customer's business, to enable effective governance and allowing service providers to focus on process improvements.

5.3.2 Online interaction management

This feature provides an interaction capability between customers/users and service providers, even among the customers/users who are using services from multiple service providers or content providers like IPTV or online gaming.

The online interaction management has the following different types of interactions:

– service evaluation, like the user-perceived quality of experience;
– SSM actors active comments or suggestions to improve the service received during the online session;
– new customization requirements;
– community exchange or sharing of online interactions to strengthen the links among the customers/users.

The online interaction may be real-time during service usage or may be after the service session is terminated.

5.3.3 Message publishing

It is necessary for most telecom operators to publish some messages or information to their service customers via web or mobile content. In SSM, features of message publishing, combined with effective mobile marketing and management, will offer to the customers enhanced user-specific targeted marketing to drive up impulse purchases of services. The messages can be categorized as follows:

– new service message announcement;
– marketing promotion messages;
– telecom service/network event report including specials and promotions;
– general notifications (e.g., disaster or other public service announcements).

5.3.4 Customer online shopping

Customers/users can use SSM for online business purposes including:

– service shopping provided by telecom operators;
– online shopping: prepaid card, handsets, MP3 players, books, etc.;
– online billing payment;
– service customer credits exchange;
– subscriber or customer management.

6 Basic objective of self-service management

SSM requires an agreement and a contractual relationship between customers and service providers as an optional precondition. In all cases, use of a service or content implies a contractual relationship only between the customer/user and the service or content provider. However, in some cases, the service provider "offers" the services or content to the customer/user as an agent of the service or content provider. In that case, the contract is still between the service or content provider and the transport or other service provider. The service customer always is the recipient party in the n-party contract for services. A customer/user who uses a SSM function is a SSM user. In some cases, the customer/user may give rights and authority to another user to act on their behalf in granting access to services or content. This special class of user is the SSM manager; i.e., a user authorized to act as an agent of the customer/user to grant others access to "use" the service. The

SSM user, customer/user, and SSM manager are key SSM actors in the delivery of self-service management.

This Recommendation will consider two possible roles of SSM user:

Role 1: an SSM user with overall authorization is a self-service manager (SS manager),

Role 2: an SSM user with authorization obtained from the self-service manager is a self-service authorized user (SS authorized user)

Authorization determines how and under what conditions and what functions are available to the SSM users. It is anticipated that the role of the SSM manager is the customer or subscriber responsible for the payment of the bill. SSM users utilize SSM services to obtain content provider or service provider services after being authorized by the SSM manager to perform the actions.

Figure 1 shows the SSM roles and interfaces (SS manager, self-service authorized user, service provider, SSM, SSM interfaces) in the general services framework from [b-ITU-T M.3340].

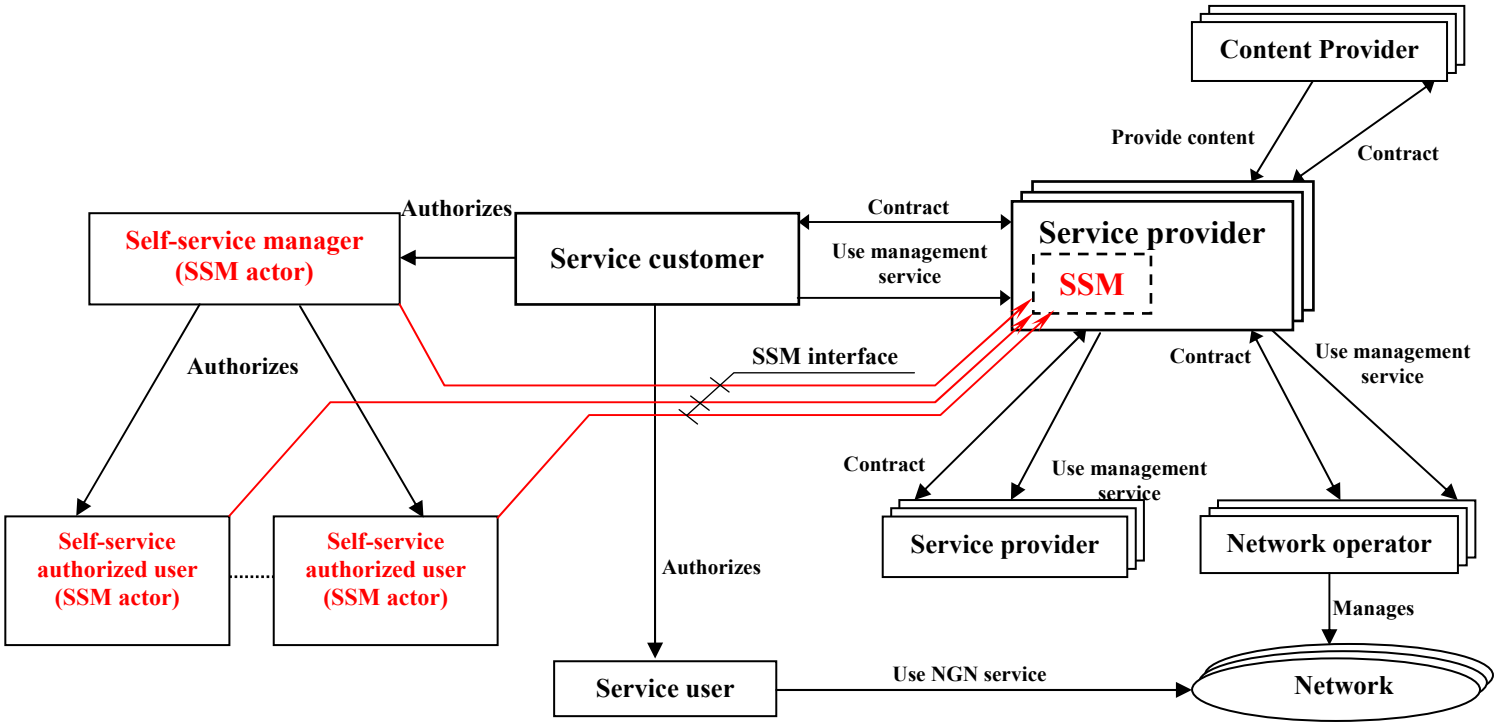

Figure 1 – Roles and interfaces in SSM

The SSM interfaces augment the SC to SP, SU to NO, and SC to SU entities shown above. The SSM actor is "authorized" by the SC to not only perform SSM, but also to authorize other users as SSM authorized users. Once authorized to perform SSM functions, the SSM authorized users or SSM actors utilize the SSM interface to the SSM processes in the service provider to perform SSM. Each user or subscriber must be mapped to a profile entity in the SSM to perform any SSM functions. The SSM will maintain historical usage information related to service provider or content provider service to customize a product catalogue for each user.

6.1 Field of application

Here are some service examples that may be managed by a SSM, at SSM actors requests:

– fixed phone service,

– mobile phone service,

– IP-based service like IPTV.

See scenario 2 in Appendix I.

7 Requirements

7.1 Basic SSM requirements

– The ability to exchange and transfer management information between the SSM actor and the service provider.

– The ability to analyse and react appropriately to management information.

– The ability to manipulate management information into a form which is useful and/or meaningful to the SSM actor.

– The ability to deliver management information to the SSM actor and the SP, and to present it with the appropriate representation.

– The ability to ensure secure access to management information by the SSM actor.

– Build service customer profile based on information other than basic service customer account information (e.g., name, address, billing information) to get more service customer information and feedback to guide selling.

– The ability for the service provider to offer marketing to service customers.

– The ability for SSM actors to choose multiple services.

– The ability for SSM actors to select options and parameters and personalize services (e.g., select service options, personalize billing, personalize trouble reports).

– Fulfil the following requirements from [b-ITU-T M.3060]:

  • Provide the management capabilities that will enable organizations offering NGN end-user services to offer customers the ability to personalize end-user services and to create new services from service capabilities (potentially from different service providers).

  • Provide the management capabilities that will enable organizations offering NGN services to provide end-user service improvements including customer self-service (e.g., provision of service, reporting faults, online billing reports).

– To provide to the SSM actors the following service fulfilment requirements:

  • Telecom product/service catalogue and price check.

  • Telecom service check and selection.

  • Telecom resource and service availability check.

- Service ordering and activation online.
- Service change or update, service parameter self-configuration.
- Service pause.
- Service termination.
- Service notification, alarm, payment setting.

– To provide to the SSM actors the following service assurance requirements:
  - Online fault/problems report.
  - Online service parameter test like broadband test.
  - Online real-time performance/SLA test.
  - Online resource availability and status check.
  - Trouble report and troubleshooting.
  - Historic data inquiries, including quality test and fault.
  - Online customer service, etc.

– To provide to the SSM actors the following service billing requirements:
  - Historic bill report and inquiries.
  - Real-time billing report and inquiries.
  - Real-time usage report and inquiries.
  - Billing and usage contrast.
  - Billing mode selection and change.
  - Online payment.
  - Prepaid service check:
    - Rest money check.
    - Usage check.
  - Electronic bill setting:
    - Email bill setting.
    - Email bill cancel.

7.2 Security requirements

SSM deals with proprietary content and important data and information about the service customer and service user. For that reason, data and information security must be a high priority.

For the secure use of a SSM, the following items need to be considered:

– authentication: This is required to verify the claimed identity. SSM actor ID, static password and dynamic password may be used for SSM actor authentication;

– authorization: Enables certain actions after authentication. This ensures that only the authorized SSM actor can be allowed access to the SSM;

– access control: To ensure that actors are prevented from gaining access to information that they are not authorized to access. Access control security mechanisms ensure that only SSM actors are allowed to manage system security resources;

– security event and alarm reporting: When SSM actors are performing key activities like logging-in, activating or modifying service parameters, logging-out, it is important to ensure that security alerts be monitored, logged, and monitored for compliance with the service security policy;

– data and information assurance is high priority;

– service customer and service user information protection is high priority.

7.3 SSM interface requirements

General requirements for the SSM interface which provide a SSM actor access (connection and interaction) to the self-service management consist of the following:

– access is independent from the type of service;

– due to the varieties of devices, mapping of interface functions to user controls should be intuitive and easy to use;

– SSM interface should be supported by all terminals.

NOTE – This requirement does not mean that all content or service types shall be capable on all terminal types.

8 SSM architecture overview

The detailed self-service management architecture (business process, functional architecture, information architecture and physical architecture) will be for further study.

Appendix I

Examples of self-service management scenarios

(This appendix does not form an integral part of this Recommendation)

Scenario 1 of SSM

Service provider: Mobile service provider.

Service: Mobile (business group).

Customer: Company.

Users: Employers.

SSM user: SSM actor.

Access to the self-service management: Via internet or via mobile phone.

Select from the menu: Service configuration (performed by SSM actor with authorization 1):

For the number 0XX/xxxxxx0: in period ....., only received calls,

For the number 0XX/xxxxxx1: in period ....., only received calls and dial numbers from the group,

For the number 0XX/xxxxxx2: possibility to dial only next three numbers 1), 2), 3),

For the number 0XX/xxxxxx3: monthly amount is ....., after that, dial only number .....

Select from the self-service menu: Service check (performed by SSM actor with authorization 2):

Number 0XX/xxxxxx4 is not available at the moment: check (is it a network problem, or is the mobile phone turned off?).

Select from the self-service menu: Customer/user experience (performed by SSM actor with authorization 1):

In region ..... signal is very low,

In region ..... mobile service is not available.

Select from the self-service menu: Billing/billing check (performed by SSM actor with authorization 3): for the numbers 1), 2) and 3) in period ..... they spend?

Select from the self-service menu: Billing/pay the service (performed by self-service manager with overall authorization), (electronic confirmation, no more paper bill, no need to go to the bank, spend time, pay provision....)

Figure I.1 shows an example of the SSM described in this appendix.

Figure I.2 shows the 2 roles of the SSM actors: one as a self-service manager and the other as an SSM authorized user.

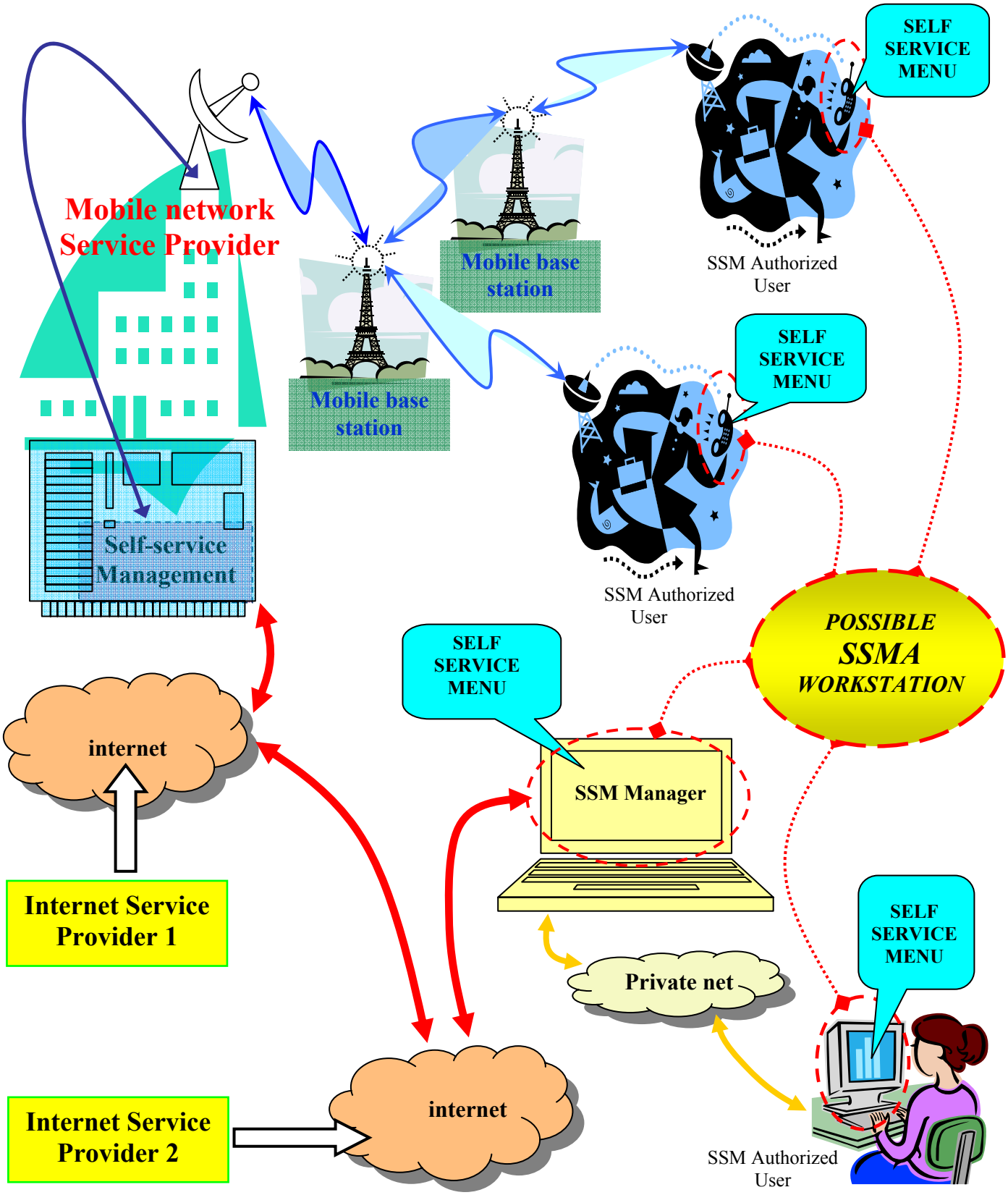

Figure I.1 – An example of the SSM implementation

Scenario 2 of SSM: Scenario for IPTV service provisioning

The SSM could provide a product that is provided by one specific service provider only, and also provide a product that is combined with other service, network or contents providers products.

In the following scenario, the first one is the predefined product, and the second, a customizable product.

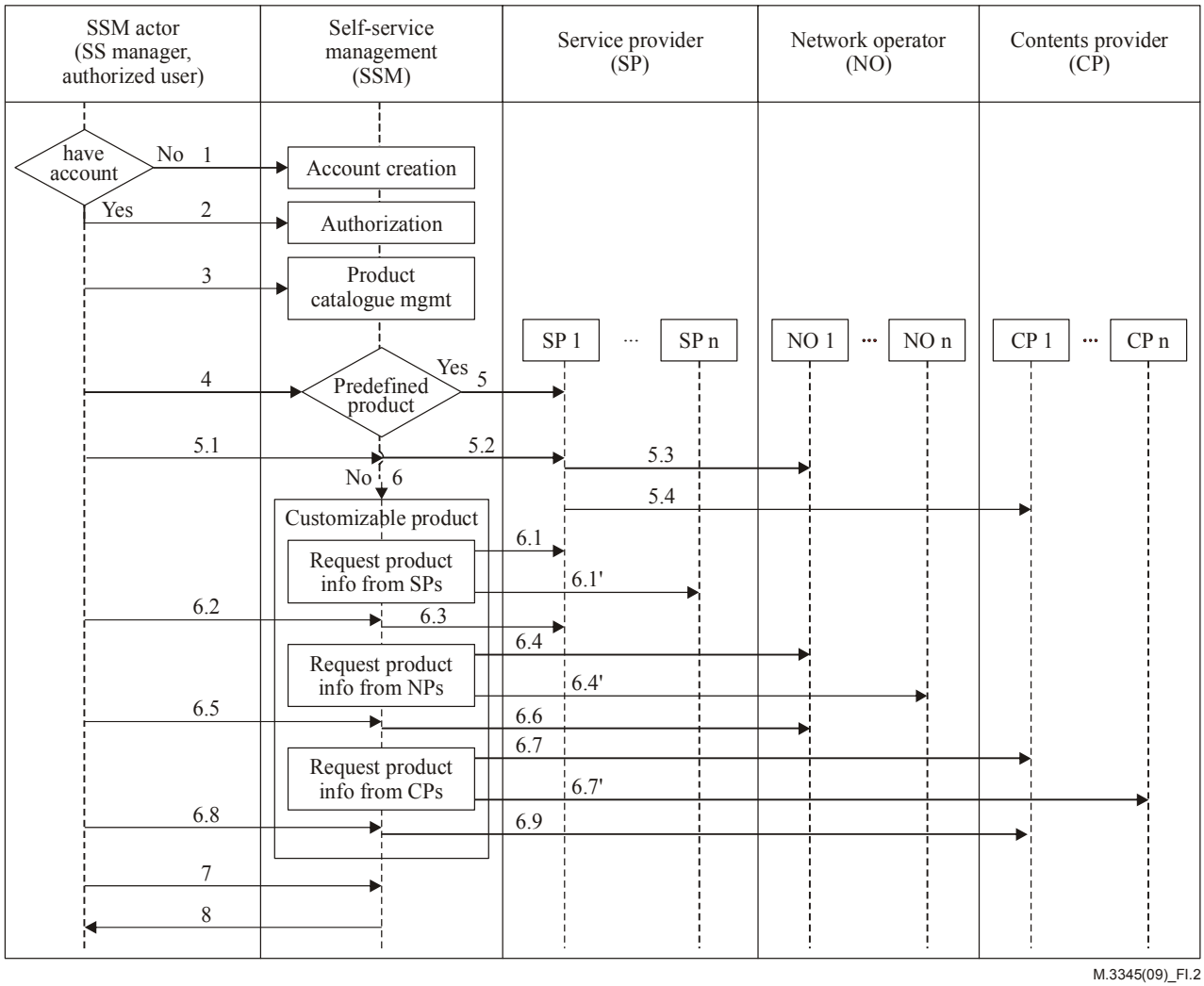

Figure I.2 – Scenario of SSM for product offering for IP-based service (IPTV)

1: Request the account creation.

2: Login (authorization) to the SSM.

3: Request product information.

4: Navigate (shopping) and select product.

5: Request the detailed information for ordering the product from SP1.

5.1/5.2: Enter the required order information and request product offering to the selected service provider.

5.3/5.4: Request the network provisioning or contents provisioning (if needed). The NO and content provider probably are predefined in the selected product by the SP.

6: Request the customizable (or personalized) product, which is combined with more than two products provided by different providers.

6.1/6.1': Request the detailed information for ordering the product of service providers with whom there is an agreement.

6.2/6.3: Select product and enter the required order information, request product offering to the selected service provider.

6.4/6.4': Request the detailed information for ordering the product related with network provisioning from the NOs with whom there is an agreement.

6.5/6.6: Select product and enter the required order information, request network provisioning to the selected network provider.

6.7/6.7': Request the detailed information for ordering the product related with contents provisioning from the content providers with whom there is an agreement.

6.8/6.9: Select product and enter the required order information, request contents provisioning to the selected contents provider.

7: Request the progress status/state information for the requested order.

8: Notification of the completion of requested order.

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