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SERIES M: TELECOMMUNICATION MANAGEMENT,
INCLUDING TMN AND NETWORK MAINTENANCE

Designations and information exchange

Formalization of data for service management

Recommendation ITU-T M.1402

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Recommendation ITU-T M.1402

Formalization of data for service management

Summary

Recommendation ITU-T M.1402 contains definitions of data for service management. The data are defined in the way they are presented to the end users at their terminals, and conceptual or internal data structures are not defined. Therefore, this Recommendation defines an external terminology schema for the given application domain.

This Recommendation focuses on defining data for products, customers, accounts, contracts, deals, addresses, prices, various segments and relationships between all these. Some attributes that are essential for identifying objects and associations between them are defined, as well.

Order data and detailed mappings to network elements are not covered. Also, billing, marketing, sales, retailer, distributor, number management, device management, location management, logistics and finance are not covered. Finally, alarms, trouble tickets, call records and other call centre information are missing.

As the data defined in this Recommendation are designed for human usage, they are independent of the functions in which they are used. Hence, the data may be applied in any functions, e.g., in customer requests, call centres, billing, service platforms, etc.

This Recommendation uses the notation and conventions found in Recommendation ITU-T M.1401, "Formalization of interconnection designations among operators' telecommunication networks".

Appendix I explains the creation of product and customer service databases.

Appendix II explains the creation of interfaces to service platforms.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T M.1402	2007-08-06	4
2.0	ITU-T M.1402	2012-05-14	2

Keywords

CRM, customer, data, definitions, product.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

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.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

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Introduction

This Recommendation defines data as they are presented to the end users at their terminals. The data are defined in an external terminology schema that provides the glossary and grammar of all permissible data to the end user.

The external terminology schema defines elementary sentence types only, which prescribe elementary sentences like "Contract 1 contains Product instance 12345678". The schema does not prescribe compound sentences, like "Contract 1 contains Product instance 12345678, which has Installation address Storgata 6", as is required at the end-user interfaces. Note that the relative pronoun "which" is not used in external terminology schemata, but may be used in the "Contents schema" for each screen or report.

The proposed external terminology schema is intended for harmonization of data across all sub-domains within service management and all channels to this application domain.

The external terminology schema focuses on end users' need for harmonized data and not on needs for storage or communication formats.

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Recommendation ITU-T M.1402

Formalization of data for service management

1 Scope

Service management is the universe of discourse (UoD) of this Recommendation. This UoD comprises products, customers, accounts, contracts, deals, addresses, prices and various segments and relationships between these.

The focus of this Recommendation is on end-user terminology as defined in an external terminology schema and which puts requirements on other schemata and implementations. As such, this Recommendation focuses on the definition of object and reference classes, and provides most identifiers and name bindings (i.e., subordinate object indicated by reversed arrowheads) for these. It also provides some attribute groups and attributes which are essential to define the data structure. Other attributes, e.g., to indicate entity history, are not covered. Also data structures for orders are not covered.

The data definitions are meant to cover the needs for customer inquiries and customer sales about the customer, their services and relations to the operator, but the definitions do not provide background information for sales people and account managers who provide offers and contracts to large customers. These may need processed information about turnover and plans for a customer/cooperation. The data structure may apply for these needs as well, but additional attributes are required. The data structure lacks the means to provide overviews for market analyses. Also, a network view for answering customer inquiries and service delivery is missing.

The data definitions cover product types as they are defined in product catalogues and cover product instances in customer databases. A subset of these product types and product instances may be implemented as telecommunication services, e.g., in a service platform. The broader context of product catalogues and customer databases is essential for definition and harmonization of service types and instances. The object class service is not defined in this Recommendation. However, the data structure defines the scope of service management.

It should be noted that product types within product catalogues are in this Recommendation defined as classes of product instances within contracts. This means that the product types may contain data that are not needed in a pure enterprise product catalogue, but these data are needed for the product catalogue to serve the role of being a schema. One contract instance may have several product catalogue instances as its schemata. One product instance in a contract is, however, only generated from one product type within a product catalogue.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T M.1401] Recommendation ITU-T M.1401 (2006), *Formalization of interconnection designations among operators' telecommunication networks*.

3 Terms and Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

- 3.1.1 **Attribute** [ITU-T M.1401]
- 3.1.2 **Attribute class** [ITU-T M.1401]
- 3.1.3 **Attribute group** [ITU-T M.1401]
- 3.1.4 **Identifier attribute** [ITU-T M.1401]
- 3.1.5 **Object** [ITU-T M.1401]
- 3.1.6 **Object class** [ITU-T M.1401]
- 3.1.7 **Population** [ITU-T M.1401]
- 3.1.8 **Reference** [ITU-T M.1401]
- 3.1.9 **Reference class** [ITU-T M.1401]
- 3.1.10 **Schema** [ITU-T M.1401]
- 3.1.11 **Subordinate object** [ITU-T M.1401]
- 3.1.12 **Subordinate object class** [ITU-T M.1401]

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CC	Country Code
CRM	Customer Relationship Management
ICC	ITU Carrier Code
KID	Customer IDentifier
LID	Local Identifier
SMS	Short Message Service
UoD	Universe of Discourse

5 Conventions

This Recommendation uses 5 mm bulleted indentations to indicate subordinate data.

Textual definitions and explanations are provided in paragraphs that are indented 5 more mm to the right.

Object classes are underlined; attribute group and attribute classes are not.

References to other object classes are written in blue fonts, in italics and underlined.

The figures use rectangles to indicate object classes.

Lines with reversed arrowheads indicate subordinate object class.

Two-way arrows indicate references between object classes.

A dashed one-way arrow supported with an S at the arrowhead indicates a schema reference from a population. Each element subordinate to a schema may be instantiated to several elements subordinate to the population. And, the schema reference may itself be instantiated, like any other reference.

A dashed one-way arrow supported with a colon (:) at the arrowhead indicates a data type. This is analogous to super-class references in object-oriented languages, where properties of the subordinate class are inherited from the data type.

A reference one level up in the data tree is indicated by a (').

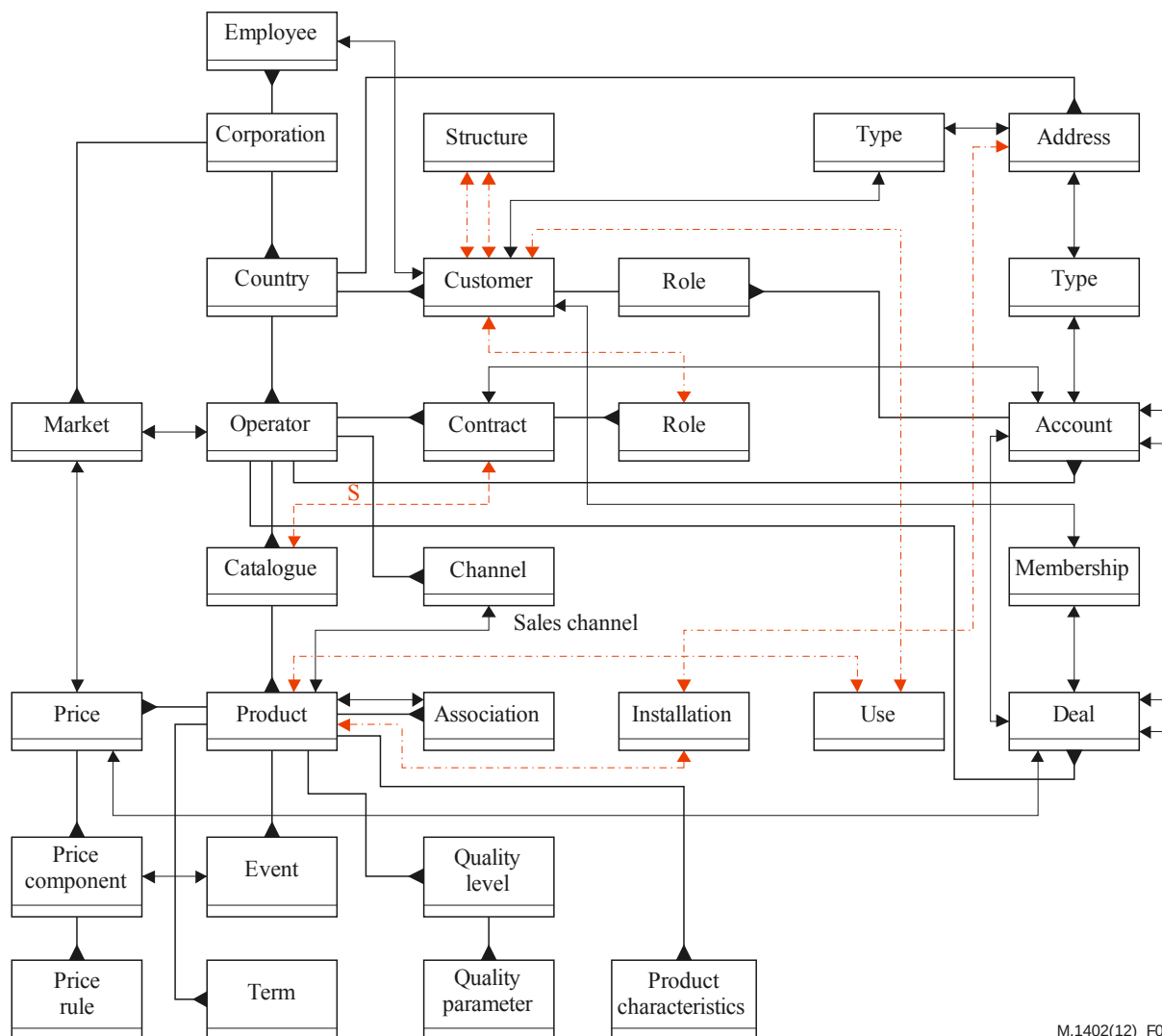
A recursive use of any number of dashes is indicated by (&).

An existential condition is stated by ($\diamond$). A data node on the left-hand side of the condition can only exist if the node referenced on the right-hand side exists.

A reference to a data node without referencing its label is stated by a parenthesis (), e.g., (Operator) refers to a superior node of Operator, i.e., the Corporation in the graph. However, by not referring to the Corporation, we can reference any node corresponding to the Corporation, i.e., one of its Populations.

Red (combined dashed and dotted) lines indicate derived references.

6 External terminology schema



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Figure 1 – External terminology schema graph for service management

Corporation

This Recommendation defines a schema of a system of a Corporation. The schema is called Corporation.

The schema contains data classes of the system. Each class acts as an original/prototype that can be copied into (several) instances subordinate to each of the populations of the schema. The S reference from a population to another data item makes the other item act as a schema relative to the population item.

Overlapping subsets of a schema may be implemented as separate systems.

▪ Country

A Country may be an independent state or a state within a union.

Operators are identified with a unique International Carrier Code within a Country. This means that a corporation must be defined with (minimum) one Operator within each Country.

▪ ▪ CC

Country Code is a three-character value according to ISO 3166-1.

- ▪ **Name**
The Country Name identifies a Country, dependency, or other area of particular geopolitical interest. Countries are assigned a globally unique Name in ISO 3166-1.
- ▪ **Address**
An Address identifies a geographical place. The identifier is independent from application domain, vendor or market segment of its use.
The Address notion does not cover bank accounts and the like. However, the post box notion is covered by the identifiers. Also, postal addresses given by place and postal code/post area are covered by the identifiers.
In this Recommendation, Address is treated as one object class only; this requires further study, e.g., separate object classes for streets, local areas, etc.
- ▪ ▪ **Installation**
An Address may have one or more subordinate Installations, which each defines a role of an Installation in this Address.
- ▪ ▪ **Type**
An Address may have one or more subordinate Types, which each indicates a role of a Type of an Account.
- ▪ ▪ **Type**
An Address may have one or more subordinate Types, which indicates a role of a Type of a Customer.
- ▪ **Customer**
Customer indicates a legal person whom the Operator relates to. This legal person may have one or more roles to Accounts, Contracts, Product instances, Deals or Employees in or from the Operator. The Role notions allow the Operator to register the Customer relative to these legal notions and not to register the Customer's internal organization structure, which may change without the Operator's knowledge.
A Customer may be a private person or a legal organization. The Customer's internal organization may indicate family, cohabitant and friendship relations, or indicate organization of geographically distributed companies and collaborative relations. The Operator may not want or be able to record this internal organization of the Customer.
- ▪ ▪ **KID**
Each Customer of the corporation's Operators shall be assigned a customer identifier (KID) that is unique within the corporation in a Country and is not specific for each business unit/Operator. It shall be possible to undertake credit control of the Customer based on the customer identifier (KID).
- ▪ ▪ **Name**
Each Customer shall have a Name within a Country. Several Customers may have identical Names. Customers may be distinguished by Address or other information.
- ▪ ▪ **Business role**
This attribute may have the following value set:
 - A – Employee in the corporation
 - F – Retailer of the corporation
 - D – Distributor of the corporation
 - L – Operator in the corporation
 - K – Competitor of the corporation