SLOVENSKI STANDARD
SIST-TS CEN/TS 16735:2015

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Poštne storitve - Razširljiva skupna struktura in prestavitev poštnih tarif - EPR

Postal services - Extensible Common Structure and Representation for Postal Rates - EPR

Postalische Dienstleistungen - Erweiterungsfähige gemeinsame Struktur und Repräsentation von Posttarifen - EPR

Services postaux - Structure commune extensible et représentation pour les tarifs postaux

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TECHNICAL SPECIFICATION

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English Version

Postal services - Extensible Common Structure and Representation for Postal Rates - EPR

Services postaux - Structure commune extensible et
représentation pour les tarifs postaux

Postalische Dienstleistungen - Erweiterungsfähige
gemeinsame Struktur und Repräsentation von Posttarifen -
EPR

This Technical Specification (CEN/TS) was approved by CEN on 30 September 2014 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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Foreword

This document (CEN/TS 16735:2015) has been prepared by Technical Committee CEN/TC 331 "Postal services", the secretariat of which is held by NEN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

Standards are important prerequisites for effective postal operations and for interconnecting the global network. Significant efficiency can be gained by implementing standards that define interconnectivity between postal operators and their customers. The postal sector is now facing the most challenging period in its long history. On the one hand, up to a few years ago the postal sector in its letter mail market has not faced competition from new entrants as a result of the historic reserved areas and letterbox monopoly. On the other hand it is confronting formidable competition from outside of its traditional boundaries (this type of competition is frequently referred to as "electronic substitution" or "electronic diversion"). One of the most effective responses to competitive pressure is innovation. Innovation involving an extensive use of modern information technology has proven to be particularly effective in many fields. However, information technology, while deeply permeating many aspects of the postal system, still lacks significant penetration when it is applied to postal product innovation, marketing and distribution. To alleviate this shortcoming UPU in collaboration with CEN/TC 331 developed and published the standard UPU S54. This standard is aimed at making a significant step forward in enabling more effective use of information technology in these areas. The standard however does not fully address effective computer-aided management of postal rates by both postal operators and their customers. This Technical Specification has been developed to provide postal operators, carriers, their customers and mailing industry at large with a tool designed for computerized creation, management and distribution of postal rates.

Mail communication involves a complex process of mail item production, induction, processing, transportation and delivery. It consists of a sequence of information and physical activities. The physical activities (required for mail item production, induction, sort, transportation and delivery) are supported by information processing activities that play an increasingly important role in the overall system. Complexity of the mail communication system also stems from the fact that different processes and activities (both physical and informational) are performed by different parties that are only loosely integrated and thus generally do not make optimal use of available information. In order to achieve a higher level of integration and better meet increasingly demanding requirements of customers, the mail communication system requires that different parties, entities and processes within the system should be integrated together via a set of standardized interfaces.

One of the most important interfaces is the set of rates for postal products. This is viewed in this Technical Specification as an information interface between posts (postal operators) and their customers, both mail senders and mail recipients. More specifically, from an information viewpoint, postal rates are data files that are created and managed by postal operators and carriers and distributed/shared with their customers.

By defining postal rates using a computerized description resulting in a standardized electronic document (postal rate file), postal operators can enable its customers to more effectively review and choose products suitable for their communication needs as well as provide for automated computing and application of postal rates during mail generation and finishing process.

The criteria that the postal rate file (as an information object) should meet are completeness, non-redundancy, consistency and unambiguous interpretation by mailers' equipment.

In order to meet these criteria it is necessary to make rate information communications and processing computerized and automated, thus achieving ubiquity, consistency, speed and error tolerance typical for internet-based information exchanges.

This Technical Specification is an information description and presentation document. It is intended as a powerful and flexible tool capable of supporting both human and machine descriptions of postal rates with arbitrary complexity. In accordance with this Technical Specification, postal rate data files are messages that are structured in accordance with a specialized data representation language named Extensible Common Structure and Representation for Postal Rates (EPR). The EPR is organized as an application-specific version of the XML. It consists of flexible and adaptable constructs (elements) and thus by its very definition is extensible.

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The EPPML standard (UPU S54-2) only briefly touches postal product prices (postal rates) and their use and communication. It defines rates communication by post and their acquisition by postal customers in a flexible manner leaving all technical details and structures of rate data outside of its scope. This Technical Specification is aimed at filling this gap.

Postal operators, their suppliers, mailing industry and mailing community at large developed many ad hoc rates structures and communication mechanisms designed to work in specific postal environments. In many instances the process of creating, updating and communicating postal rates (tables) is costly and time-consuming while there is a growing need to have fast (e.g. at the speed of the internet) distribution of rates and rate updates from postal operators to their customers (mailers and in some instances also mail recipients). Traditional methods as they are practiced today by a vast majority of postal operators involve distribution of postal rates to customers via physical documents or electronic documents that are not designed for automated interpretation and processing by computers. In case of commercial mailers who mail from tens to millions of mail unit per day this results in a manual process of rate data translation into data structures suitable for computer processing by mail generation and finishing equipment. This process is most frequently performed by trained professionals employed by the mailing industry (typically manufacturers of just mentioned mailing equipment), at a large cost and inconvenience to mailers and postal operators. However, an examination of postal rate data (typically rate tables) and their communication mechanisms as practiced by a majority of technically advanced postal operators revealed mostly common structure, features and approaches. This suggests that there has to exist a common, flexible and extensible data structure suitable for use as a basis for automated postal rate management and communication in all mailing environments, from SMEs to large enterprises. Modern general data representation language such as XML can be adapted for the purpose of defining such a structure, which is referred below as the Extensible Common Structure and Representation for Postal Rates or the EPR.

This Technical Specification presents detailed and practical description of the EPR while leaving decisions and implementation of actual postal product pricing (e.g. valuation) to postal operators, their regulators (if any) and the mailing industry. Postal operators and mailing industry can use this Technical Specification, as a guidance document for the development of their own software tools that, when implemented, will allow quick and cost effective postal rate management process.

This Technical Specification should be viewed by postal operators, their suppliers and mailing industry at large as a valuable data representation standard and a tool that will facilitate all stages of postal rates life-cycle processing and management from creation by postal operators to installation and use in customer mailing equipment and ultimate disposal.

"Postal products" are referred to below simply as "products". The reader is referred to the UPU S54 standard for detailed discussion and definition of various aspects and attributes of postal products. Postal products are always associated with postal rates, which is a specific established term for postal product prices. When a class of the mail unit (i.e. letter, flat or parcel) is not mentioned it usually implies any suitable class. This Technical Specification uses the established definition and terminology for the "mail unit" as a physically constrained unit consisting of one or more mail items and/or lower level mail units, together with the means of constraint (as defined in the UPU Standards glossary). The terms "mailer" and "sender" are used interchangeably.

The notion of the postal product is a complex one. Unlike common products (food, clothing, books), that are bought and consumed every day, postal product consumption requires significant cooperation between product producers (postal operators and carriers) and consumers (mailers and recipients). An important part of cooperation involves computation of the rate for a postal product that is to be paid to a postal operator offering this product for sale. This computation is commonly known as a "rating" or "rating process" and most frequently performed during mail unit generation and finishing process that takes place in a mailer's environment (this is due to prepayment requirement imposed by majority of postal operators or simply because of a need of the mailer to know the charges before the product is purchased). The rating process requires knowledge of three fundamental components, namely (a) measurable, computable or stored attributes of the mail unit to be mailed and the product to be used by the mailer in association with this mail unit, (b) prices or rates for postal products (typically postal rates tables), and (c) an algorithm that inputs (a) and (b) and outputs the rate for the mail unit and the associated product chosen by the mailer. The most

common computational algorithm is known as a "look-up table" algorithm, which refers to a traditional human method of price determination when rates tables for each category of products are indexed by the attributes of mail unit and postal product (such as weight, distance from origination to destination, level of presort or worksharing, etc.). The algorithm is a simple search in a table whose rows and columns are indexed. The algorithm is normally stable and known in advance to both mailers and postal operators. Thus, for every act of mail rating, the detailed description of the algorithm does not need to be shared between mailers and postal operators. In this manner, the rate computation for an individual mail unit requires obtaining information from two sources, one controlled by the mailer (the mail unit itself and the product to be used in conjunction with the mail unit) and one controlled by the postal operator (postal rates tables). The main purpose of this Technical Specification is codification of a broad variety of postal rates tables in a standardized manner suitable for effective (without human involvement) computer processing in a mailer's environment.

Postal customers are traditionally divided into several categories depending on the volume of mail units they produce and send and the level of automation and equipment they use for mail production.

There are individual users who create a few mail units using manual process. For the individual users many postal operators provide access to a postal website where such users can rate their mail using a feature typically known under the name "postal calculator" or "calculator". In this case while being connected to a postal website the user enters all relevant parameters of the mail unit and product and obtains the price for the service (rate). Individual users will have little benefit from this Technical Specification and thus are not a main target for its implementation.

Then there are small and medium size enterprises and businesses (SMEs), which typically produce and rate from tens to a few hundreds of mail units per day and use computerized mail finishing equipment such as mailing and franking machines. These users depend on manufacturers of mailing equipment for having up to date postal pricing (rate) information since rating in this environment is done automatically by the mailing machine. These users buy a broad variety of postal products (from letter mail to express and parcel products) and are expected to greatly benefit from this Technical Specification. For example pricing for postal products marketed to this class of customers can be updated and communicated to their mailing equipment instantly providing for a great speed, flexibility and convenience, which is very desirable.

Finally there are large enterprises that produce thousands and even millions of mail units per day using sophisticated high speed mail generation and finishing equipment such as inserters, mail assembly conveyors and the like. This type of customers frequently uses the so-called "negotiated rates" that are not published. The number of such customers is relatively small and they frequently have technical professionals involved in mailing (and rating) process. They are also expected to benefit from this Technical Specification since it will allow for quicker and more efficient rate updates and communication. For example a nimble and effective dynamic capacity management by postal operators involves stimulation of sales by lowering product prices where there is an excessive unutilized capacity for delivery of such products. This Technical Specification is aimed at enabling this capability by providing means for computer-to-computer communication and processing of postal rates.

With implementation of this Technical Specification postal operators and carriers are expected to achieve increased flexibility of new products introductions, nimble rates management commensurate with market and capacity conditions and will be able to introduce and verify new pricing models. Note that introduction of new products require many activities other than rating. These activities are outside of the scope of this Technical Specification.

This Technical Specification is applicable to all categories of postal products without restrictions.

Graphically, traditional rate management process can be represented by the following figure:

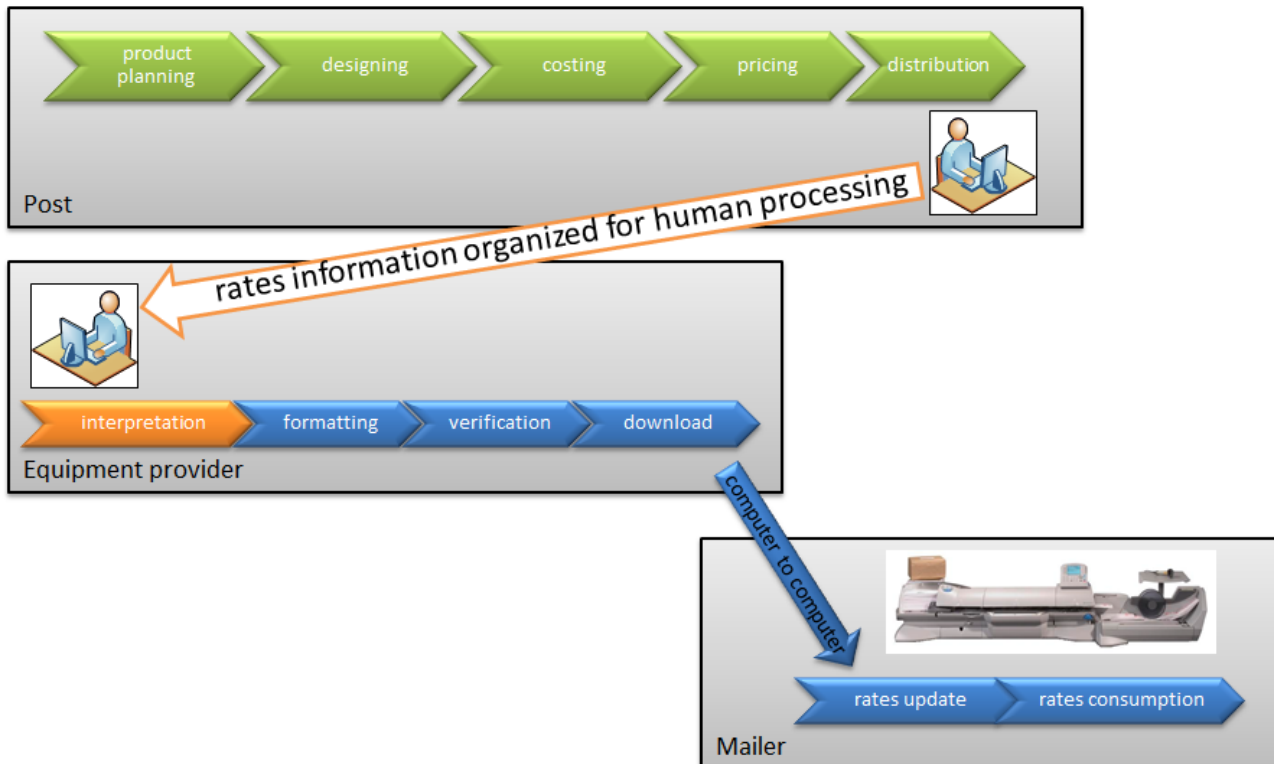**Figure 1 — Manual postal rates management and distribution process**

Activities that take place in the postal environment (product planning, designing, costing and pricing) end up with the distribution of postal rates (predominantly organized as tables) to customers and their suppliers (mailing equipment manufacturers). In the traditional rates management process the rates data are organized for human consumption and requires quite significant manual (programming) effort to be converted into computer processable data at the major expense and inconvenience to mailers and postal operators. This Technical Specification is designed to provide a description of a rate data structure that when implemented will allow to replace the traditional postal rates management and distribution process by a new process graphically represented by the following figure:
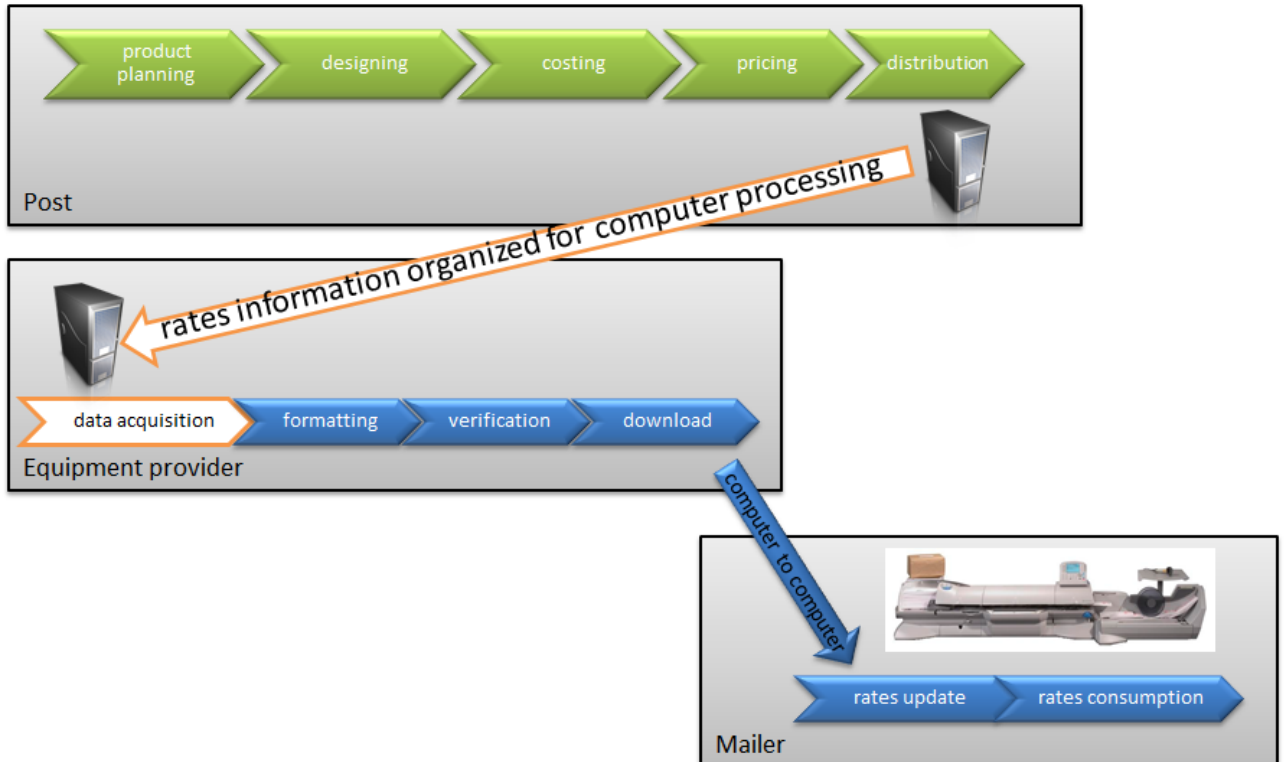
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Figure 2 — Automated postal rates management and distribution process

In the automated rates management process postal rates data are organized for computer-to-computer communication. Rates computation in Figure 1 and Figure 2 implies mail rating algorithm, which automatically inputs and processes EPR data structured in accordance with the present Technical Specification.

The main body of this Technical Specification contains six substantive clauses and five informative annexes:

General Concepts: explains concepts and describes the application of EPR in defining postal rates by postal operators and processing them by mailers' computerized equipment.

EPR XML Schema: defines the EPR schema using subclauses each dedicated to a specific element of the schema. Whenever possible each element is provided with a detailed description, a motivation for its specified organization and an example.

However, the structure of the EPR schema enables significant flexibility in the representation of postal rates. Postal product pricing experts are encouraged to explore this flexibility of representations of postal rates supported by EPR and to identify those that are most suitable to their environment that is by necessity post-specific.

Expected readership of this Technical Specification includes postal financial, marketing and product development experts, and IT professionals as well as technical professionals in the mailing industry. Technical implementation of this Technical Specification requires proficiency with XML concepts and constructs and thus implementation related information in this document is intended primarily for IT professionals. Experts in other fields (e.g. finance, marketing and product development and inspection) will find it useful to read the Introduction and General Concept clauses and are encouraged to work in concert with IT professionals toward building an effective EPR-based rate management process.

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1 Scope

This Technical Specification defines a uniform structure and meaning for the information that fully represents postal rates for a broad variety of postal products in all mail categories. The postal rates definition is viewed as an important interface between posts and their customers and as such will benefit from standardization. Such representation of postal rates allows automated systems to uniformly use postal rates as they are introduced for new products or updated for existing postal products by postal operators. A postal rate file (PRF) is an XML document, which fully describes postal products rates. It contains all necessary and sufficient information for both postal operators and their customers to efficiently create, respectively acquire, update and process postal product rates. The structure, types and constraints of XML elements in an XML document are defined by an XML schema. The Extensible Postal Rates (EPR) schema is the XML schema that governs Postal Rate Files.

This Technical Specification contains a complete description of the EPR schema, its hierarchical structure, information types and semantics of its elements.

This Technical Specification neither defines nor constraints how postal rates are created by postal operators but rather provide a powerful and flexible tool that supports efficient rates definition, management and distribution.

This Technical Specification does not define communication protocols that can be used by posts to distribute postal rates files to their customers. Suitable communication protocols are typically well known and already standardized (for example: Web Services, File Transport Protocol, email, etc.). The standard also does not define valuation of postal products as applied by postal operators and their customers.

2 Normative references

Not applicable.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE   A number of common terms used in this document are defined in documents which are referred to in the Bibliography. Definition of frequently used or particularly important terms as well as other terms introduced in this document are given below.

3.1
dimensional (volumetric) weight
value that is produced as a result of calculation of a mail unit weight based on the International Air Transport Association (IATA) volumetric conversion factor and used for the purpose of rate calculation instead of mail unit actual measurable weight

Note 1 to entry: Using IATA conversion factor dimensional (volumetric) weight is computed by multiplying the length, the height and the width of the mail unit and dividing the result by 166 in^3/lbs (if mail unit dimensions are measured in inches) or by 6,000 cm^3/kg (if mail unit dimensions are measured in centimeters).

Note 2 to entry: Dimensional weight takes into account the density of the mail unit, which is the amount of space the mail unit occupies in relation to its measurable weight.

Note 3 to entry: The conversion factor established by IATA is somewhat arbitrary and can be revised by individual postal operators and carriers depending on the cost of transportation (air, ground, sea) and other factors.

3.2
calculated weight
value indicative of the weight of the mail unit that is used for the purpose of rate calculation

Note 1 to entry: The calculated weight is computed by using specified algorithms which may include selection and thresholding.

3.3
zone-based distance
value indicative of the distance between mail unit origin and destination that is computed using zone codes assigned to its origin and destination

Note 1 to entry: The zone codes are established by dividing the geographical area served by the postal network into smaller subareas, each of which is assigned a code value.

3.4
calculated distance
value indicative of the distance between origin and destination that is used is for the purpose of rate calculation

Note 1 to entry: The calculated distance is computed by using specified algorithms which may include selection and thresholding.

3.5
base amount
amount that represents a component of the overall postal rate that is computed by accounting for the weight, product and distance dependent elements of the postal rate

Note 1 to entry: The base amount roughly reflects contributions to the postal rate that are based on the cost of delivering the postal product for a given mail unit.

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3.6
distance and weight-based fee
component of the postal rate that is a function of the calculated distance between origin and destination and the calculated weight of the mail unit.

Note 1 to entry: The distance and weight-based fee represents a surcharge imposed on heavyweight mail units and/or mail units destined for destinations associated with additional delivery cost compared to other destinations.

3.7
over-dimension fee
component of the postal rate that is a function of the mail unit dimensions

Note 1 to entry: The over-dimension fee represents a surcharge imposed on mail units having one or several of their dimensions outside of a pre-determined range and reflects an extra cost associated with processing, transportation and delivery of such units.

3.8
value-based fee
component of the postal rate that is a function of the value of the mail unit content

3.9
quantity-based fee
component of the postal rate that is a function of the number of mail units inducted into the postal distribution network as a part of mailing submission

Note 1 to entry: The quantity-based fee can be positive, when the number of mail pieces in the submission is below a pre-determined threshold or negative (discount) when this number is above the threshold.

3.10
amount fee
component of the postal rate that is a function of the base amount

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3.11
date/time-based fee
component of the postal rate that is dependent on the date (including time) of the mail unit(s) induction

3.12
value-added service-based fee
component of the postal rate that is dependent on value-added services provided in addition to the services typical for basic products

Note 1 to entry: The value-added service-based fee reflects the view that postal products consists of basic delivery services and additional services such as track and trace and proof of deposit or delivery.

3.13
generic fee
component of the postal rate that is dependent on a number of possible cost, competitive or regulatory considerations and factors

Note 1 to entry: The generic fee could be positive or negative and is included for extensibility purposes. For example a generic fee may be imposed depending on the type of mail unit recipient (e.g. business or residential) or on the type of mailer (e.g. non-profit or commercial).

3.14
algorithm ID
identifier that uniquely references an algorithm involved in the postal rate computation

Note 1 to entry: The Algorithm ID provides for unambiguous understanding between postal operators and customers concerning the method and steps involved in the postal rate computation for a given product and mail unit.

3.15
range descriptor
formal mechanism that identifies an interval containing the value of a parameter involved in the postal rate computation

Note 1 to entry: The range descriptor consists of one or two boundary values that determine minimum and/or maximum value that a given parameter is allowed to take, for example a range of weights or distances.

3.16
zone code
value assigned to a geographic area

Note 1 to entry: The zone codes are established by dividing the entire geographical area served by the postal network into smaller subareas, each of which is assigned with a single code.

Note 2 to entry: Zone codes can be expressed in a multitude of ways (integers, alphanumeric codes, etc.). Different postal product providers typically employ different representation for the zone codes.

3.17
mailer category
input to the postal rate tax computation that is dependent on the type of the sender (mailer)

Note 1 to entry: The mailer category allows distinguishing between different types of mailers (e.g. social or business) for the purpose of tax imposition.

**3.18**
content category
input to the customs fees computation that is a function of the mail unit content

Note 1 to entry: The content category allows distinguishing between dutiable and non-dutiable merchandise (e.g. merchandise that is intended for commercial sales as opposed to the merchandise indented for personal consumption).

4   Symbols and abbreviations

The following graphic conventions are used throughout the document:

This symbol indicates that a sequence containing all descendant elements is expected.

This symbol indicates a choice of one element from its descendants.

This symbol indicates a choice of one or more elements from its descendants. The text refers to it as *(one…many)*.

The use of dotted lines indicates that the choice is optional, for example   means zero or more descendants are allowed. The text refers to it as *(zero…many)*.The descriptor *"(one…many)"* designates the cardinality of an element when one or more instances of this element are allowed. The descriptor *"(zero…many)"* is used to indicate an optional element that can be present in multiple instances.

The symbol   indicates an algorithm. The text inside the rounded rectangle indicates the name of the algorithm.

5   General Concepts

5.1   Extensible Common Structure and Representation for Postal Rates (EPR)

As an informational object, postal rates can be defined by a formal (computerized) information structure consisting of elements organized as an extensible collection of attributes, their values and relations. When described in EPR, postal rates form an input to a rate computation that takes place during mail generation/finishing process. The diagram in Figure 3 depicts interactions between mailers and postal operators that take place in the context of mail rating. The rate computation for a given mail unit (MU) is preceded by the process of selection of the postal product by the mailer which takes as inputs the MU attributes, mailer requirements and the postal product description (e.g. postal product definition file). Following product selection the mailer computing system calculates the rate by taking the selected product, the postal rate file, the MU attributes and mailer requirements as inputs.