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Financial services — Natural person identifier (NPI)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 68, *Financial services*, Subcommittee SC 8, *Reference data for financial services*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Identification of natural persons for the purposes of provision of financial services has specific applications for protecting the personal data of the employees of financial services firms, allowing these firms to respond to the requirements of regulation without exposing personal information and giving regulators a privacy-protected way to identify beneficial owners, among other use cases.

Benefits include straight-through processing savings, the ability to monitor systemic risk across jurisdictions and, more importantly, the ability to protect citizens' personal information during the provision of services while responding to regulatory requirements.

This document fulfils the needs of the global financial services industry and the regulatory community for natural person identification. Its key provisions are that it:

— enables unique identification globally of natural persons requiring an identifier;

— defines a natural person identifier (NPI) code that contains no embedded intelligence;

— defines an NPI code that is interoperable with other standards and existing reference data and can be applied globally to support the financial services industry;

— leverages the expertise of ISO/TC 68 in defining and maintaining identifier standards;

— defines an NPI scheme that is reliable and an NPI code that is persistent;

— defines an NPI scheme that is extensible and free from limitation on use and redistribution.

Already existing national NPIs might not be applicable in cross-border transactions. The NPI defined in this document intends to close this gap, allowing a co-existence of national identifiers and the international NPI.

Financial services — Natural person identifier (NPI)

1 Scope

This document specifies a machine-readable, unambiguous natural person identifier (NPI) and the relevant reference data to uniquely identify the natural person relevant to any financial transaction rather than the personal identifying information.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country code*

ISO/IEC 7064, *Information technology — Security techniques — Check character systems*

ISO 8601-1, *Date and time — Representations for information interchange — Part 1: Basic rules*

ISO 17442 (all parts), *Financial services — Legal entity identifier (LEI)*

ICAO 9303, *Machine Readable Travel Documents*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Structure of the natural person identifier

This document uses the following conventions for data element representations:

a) Character representations:

— n: digits (numeric characters 0 to 9 only);

— c: upper-case alphanumeric characters (A to Z and 0 to 9 only).

b) Length indications:

— nn!: fixed length;

— nn: maximum length.

The format of the NPI shall be

— 13!c2!n.

The NPI consists of 15 characters decomposed as follows:

— characters (13!c) without separators or “special” characters;

— the 14th and 15th characters (2!n) shall be the check digit pair, as calculated based on the procedure defined in this document.

5 Check digits

5.1 General

The check digits shall be calculated based on the simplified procedure defined in ISO/IEC 7064 (refer to MOD 97-10 for the simplified check digit calculation) after the conversion of the (leftmost) 13 alphanumeric characters into a character string consisting only of digits. The check digits are used to verify the NPI.

Valid check digit pairs are in the range of [02 .. 98]. 00, 01 and 99 are not valid NPI check digit pairs.

If the check digits have been calculated correctly, when the entire 15-character NPI is converted to numbers following the process described in step 1 of 5.2 and divided by 97 as described in step 3 of 5.2, the remainder shall be “1”.

5.2 Calculating the check digits

Step 1: Any letters in the 13-character string shall be converted to digit pairs in accordance with ISO/IEC 7064 (MOD 97-10).

A = 10	*F* = 15	K = 20	*P* = 25	U = 30
B = 11	G = 16	L = 21	Q = 26	V = 31
C = 12	H = 17	M = 22	R = 27	W = 32
D = 13	I = 18	*N* = 23	S = 28	X = 33
E = 14	J = 19	O = 24	T = 29	Y = 34
				Z = 35

Step 2: Two zeros shall be appended to the resulting string at the rightmost positions.

Step 3: A Euclidian division of the resulting number by 97 shall be performed to determine the remainder.

Step 4: The remainder shall be subtracted from 98 to determine the check digit pair.

Step 5: The check digit pair shall be appended to the original 13-character string to arrive at the NPI.

See Annex A for examples

6 Natural person identifier data record

The NPI data record shall be composed of the data attributes shown in Table 1.

Table 1 — NPI attributes

Reference data element	Description	M/MwE/O/C	Cardinality[c]	Discussion/commentary
Legal name – surname/family/last name/sole name[a]	The surname shall be as validated by a valid certificate (e.g. birth certificate, passport).	M	1..1	Where only one name is held by the natural person, that name should be recorded in this field as is usual policy for jurisdictions where this convention currently applies. Where more than one legal name is held by the natural person, those names will be captured in the alternative name element. This field shall accommodate alternative alphabets and transliteration.
Legal name – middle name[a]	The middle name shall be as validated by a valid certificate (e.g. birth certificate, passport).	O	0..*	This field shall accommodate alternative alphabets and transliteration. Captured: number of middle names (check with passport restrictions).
Legal name – given name/first name[a]	The first name shall be as validated by a valid certificate (e.g. birth certificate, passport).	MwE	1..1	Where only one name is held by the natural person, that name should be recorded in the surname/last name element as is usual policy for jurisdictions where this convention is currently recorded. This field shall accommodate alternative alphabets and transliteration. Some jurisdictions utilize this field for first and middle names in official documentation. In order to accommodate variations on how names are structured, the syntax restrictions on this data should be xsd:string. In the case of changing names, the identifier should stay the same.
Alternative name(s)	Nicknames, aliases, "known as", maiden names, alternative legal name(s).	O	0..*	Freeform, unbounded, transliterate.
Alternative name type	For example "known as", maiden name, alias, nickname.	O	0..*	Shall use a controlled vocabulary set.

Key

M mandatory

MwE mandatory with exception

O optional

C conditional

[a] See Annex C for names.

[b] The type of certificate, number of certificate and validity of the certificate (e.g. expiry) must be captured.

[c] Cardinality rules:

— 0..* (optional, zero or more);

— 1..1 (one to one);

— 1..* (one to many).

Table 1 *(continued)*

Reference data element	Description	M/MwE/O/C	Cardinality[c]	Discussion/commentary
Date of birth	Mandatory field, with an exception for certain cases if this date of birth cannot be validated against an official source.	MwE	1..1	Use representation of date as per ISO 8601-1.
Country of birth	The geographic place where the natural person was born (country), with an exception for certain cases where the place of birth cannot be validated against an official source.	MwE	1..1	As at the date of birth of the natural person. Use ISO 3166-1.
Phone number(s)	The phone number(s) of the natural person at time of issuance. Shall accommodate multiple phone numbers types (e.g. personal, mobile).	O	0..*	At time of NPI issuance.
Phone number type	The type of telephone number, e.g. mobile, home, work. Only mandatory when phone number(s) specified.	C	0..*	Shall use a controlled vocabulary set. Conditional; mandatory where phone number(s) captured.
Email address(es)	The email addresses(s) of the natural person at time of issuance. Shall accommodate multiple email types (e.g. personal, work).	O	0..*	At time of NPI issuance.
Email address type	The type of email address, e.g. personal, work.	C	0..*	Shall use a controlled vocabulary set. Conditional; mandatory where email address(es) captured.

Key

M mandatory

MwE mandatory with exception

O optional

C conditional

[a] See Annex C for names.

[b] The type of certificate, number of certificate and validity of the certificate (e.g. expiry) must be captured.

[c] Cardinality rules:

— 0..* (optional, zero or more);

— 1..1 (one to one);

— 1..* (one to many).

Table 1 *(continued)*

Reference data element	Description	M/MwE/O/C	Cardinality[c]	Discussion/commentary
Citizenship/ nationality	Current citizenship(s) held by the natural person.	M[b]	1..*	Use ISO 3166-1. Assume that in this case citizenship and nationality are synonymous. Exception routine – capture what identification (ID) is available. Exception routine for stateless persons. Utilize code sets where available, i.e. ICAO 9303 or ISO 3166-1 (three-character code).
Physical address(es)	The physical address(es) of the natural person.	M[b]	1..*	At time of NPI issuance. The physical address structure shall be granularly constructed and should implement the postal address component registered with the ISO 20022 Registration Authority. Exception, e.g. stateless persons.
Physical address(es) type	The type of physical address (e.g. home, office).	C	1..*	Shall use a controlled vocabulary set. Conditional: mandatory where physical address(es) captured.
Jurisdictional ID string	The (jurisdictionally unique) number of the jurisdictional identification presented by the natural person.	M[b]	1..*	For underlying jurisdictional IDs, suitable administrative data shall be captured for each ID source which will allow for that ID to be validated or used, i.e. expiry date.
Jurisdictional ID type	The type of jurisdictional identification presented by the natural person. For a given jurisdictional ID type and individual, there can be only one ID type per person.	M[b]	1..*	
Jurisdictional ID jurisdiction	Jurisdiction of the jurisdictional ID presented by the natural person.	M	1..*	Utilize code sets where available, i.e. ICAO 9303, ISO 3166-1.
Gender	The gender of the person as provided.	O	0..*	Current values of list maintained outside this document: male, female, other, did not disclose.

Key

M mandatory

MwE mandatory with exception

O optional

C conditional

[a] See Annex C for names.

[b] The type of certificate, number of certificate and validity of the certificate (e.g. expiry) must be captured.

[c] Cardinality rules:

— 0..* (optional, zero or more);

— 1..1 (one to one);

— 1..* (one to many).

Table 1 *(continued)*

Reference data element	Description	M/MwE/O/C	Cardinality[c]	Discussion/commentary
Biometrics	Optional and defined as "biologically unique to the individual".	O	0..*	Includes facial data, fingerprint data, iris data, vein pattern data, genomic data (short tandem repeat). The ISO/IEC 39794 series or the ISO/IEC 19794 series.
Record status flag	A flag that indicates the status of the natural person ID.	M	1..1	Status for the whole record. Allows for expunging underlying metadata as needed. Allows for retirement of those NPIs where the person identified is deceased. Record status flag includes "issued, lapsed, merged, retired" as used for the ISO 17442 series.
Record status reason	The reason for the record changing. Potential status includes cancellation due to duplicate issuance, change or metadata expunge.	O	0..*	Reasons shall be optional and the reason may remain at the jurisdictional level. Public availability may compromise privacy. The NPI shall continue regardless.
Record status date	The date the NPI record status changed.	M	1..1	
Validation flag	Indicates that the associated data element has been validated from an official source.	M	1..1	
All validated fields – validation source	The source(s) of the document used for validation of the data element associated.	M	1..*	

Key

M mandatory

MwE mandatory with exception

O optional

C conditional

[a] See Annex C for names.

[b] The type of certificate, number of certificate and validity of the certificate (e.g. expiry) must be captured.

[c] Cardinality rules:

— 0..* (optional, zero or more);

— 1..1 (one to one);

— 1..* (one to many).

See Annex B for a UML example.

Annex A
(informative)

NPI check digit validation example

A.1 Calculation

a) Start – Take a 13-character string assigned for an NPI without check digits:
YZ83GD8L7GG84.

b) Step 1 – Convert the letters in the string to digit pairs in accordance with ISO/IEC 7064 (MOD 97-10):
3435831613821716184.

c) Step 2 – Append two zeros to the resulting string at the rightmost positions:
343583161382171616840 0.

d) Step 3 – Perform a Euclidian division of the resulting number by 97 to determine the remainder:
Remainder = 34.

e) Step 4 – Subtract the remainder from 98 to determine the check digit pair:
Check digit pair = 64.

f) Step 5 – Append the check digit pair to the original 13-character string to arrive at the NPI:
NPI = YZ83GD8L7GG8464.

A.2 Validation

A.2.1 Example with correct check digits

NPI including check digits: YZ83GD8L7GG8464.

a) Convert the letters in the string to digit pairs in accordance with ISO/IEC 7064 (MOD 97-10):
3435831613821716168464.

b) Perform a Euclidian division of the resulting number by 97 to determine the remainder:
Remainder = 1.

c) Confirm the validity of the check digit pair and remainder:
The check digit pair is in the range [02 .. 98] and the remainder of the division is 1.

The NPI YZ83GD8L7GG8464 is therefore determined to be valid.

A.2.2 Example with incorrect check digits

NPI including check digits: YZ83GD8L7GG8484.

a) Convert the letters in the string to digit pairs in accordance with ISO/IEC 7064 (MOD 97-10):
343583161382171616848 4.

b) Perform a Euclidian division of the resulting number by 97 to determine the remainder:
Remainder = 21.

c) Confirm the validity of the check digit pair and remainder:
The check digit pair is in the range [02 .. 98], but the remainder of the division is not 1.

The NPI YZ83GD8L7GG8484 is therefore determined to be invalid.

A.2.3 Example with incorrect check digits

NPI including check digits: 315700K7NYVBU01.

a) Convert the letters in the string to digit pairs in accordance with ISO/IEC 7064 (MOD 97-10):
315700207233431113001.

b) Perform a Euclidian division of the resulting number by 97 to determine the remainder:
Remainder = 1.

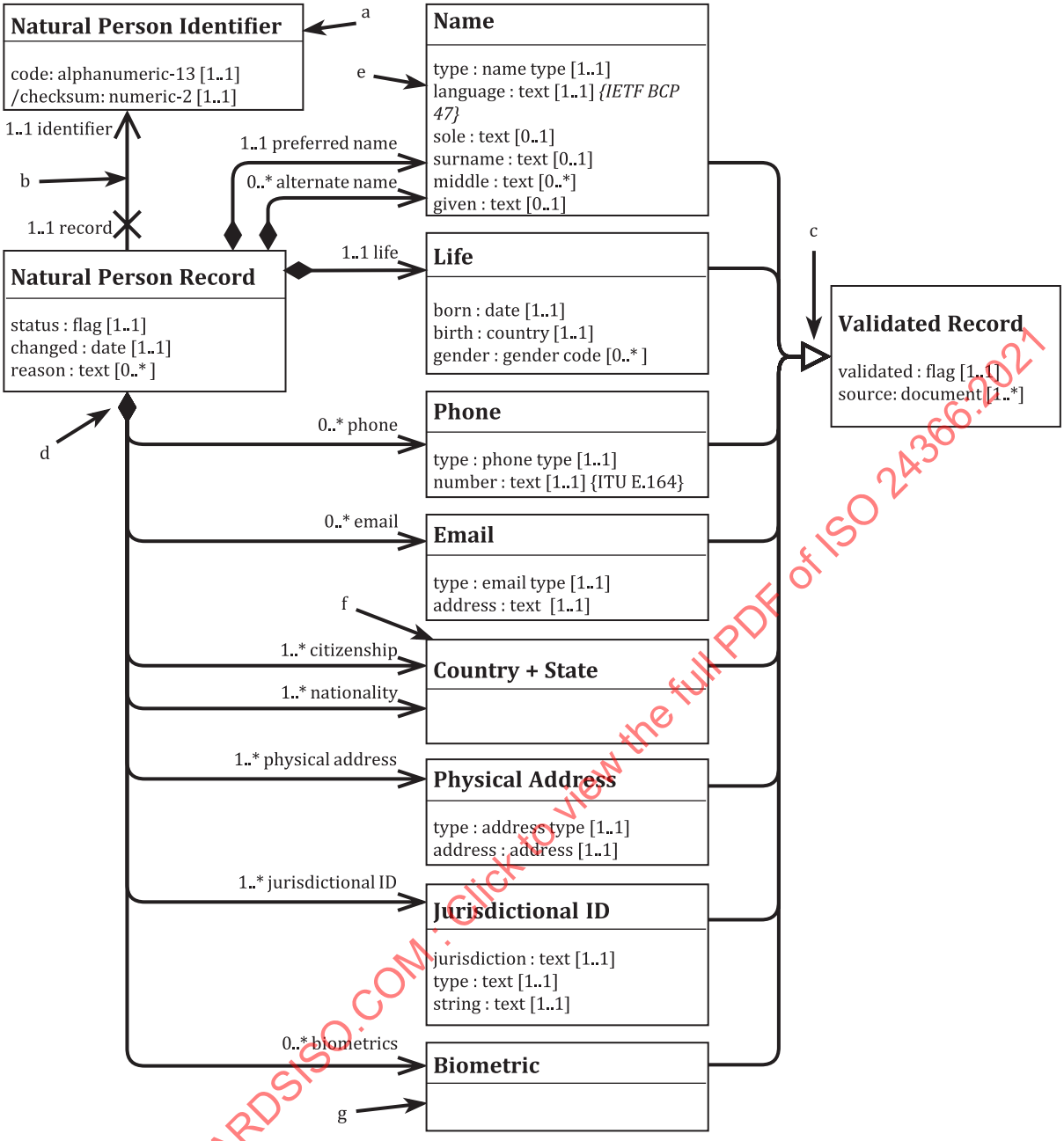
c) Confirm the validity of the check digit pair and remainder:
The remainder of the division is 1, but the check digit pair is not in the range [02 .. 98].

The NPI 315700K7NYVBU01 is therefore determined to be invalid.

Annex B
(informative)

Conceptual diagrammatic expression

Figure B.1 illustrates one way an NPI and record can be interpreted as a UML class diagram, in accordance with the ISO/IEC 19505 series.



Key

a An NPI has a 13-character alphanumeric code and a derived two-character numeric checksum which is derived by the method described in ISO/IEC 7064 (MOD 97-10) applied to the code.

b This arrow with a cross indicates direction of navigability. An NPI can be accessed efficiently from a natural person record. A natural person record might not be accessible from an NPI.

c The open triangle indicates generalisations. Life, name, phone, email, country + state, physical address, jurisdictional ID and biometric are all types of validated record. This means they all have a validated flag and one or more source documents.

d The solid diamond indicates composition. The natural person record is composed of various kinds of validated records.

e Each name requires either a sole name or surname.

f Country and state is a union of country codes with codes representing various forms of states.

g Biometric data as defined by the ISO/IEC 39794 series and the ISO/IEC 19794 series.

Figure B.1 — Natural person identifier UML class diagram