ECBS

EUROPEAN COMMITTEE FOR BANKING STANDARDS

IBAN: INTERNATIONAL BANK ACCOUNT NUMBER

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FOREWORD

THE INTERNATIONAL BANK ACCOUNT NUMBER (IBAN)

The IBAN concept was developed by ECBS and by the International Organization for Standardization (ISO) and is an internationally agreed standard ISO 13616: 1997.

It was created as a viable and practical international bank identifier, used internationally to uniquely identify the account of a customer at a financial institution, to assist error-free cross-border payments, and to improve the potential for straight through processing1 (STP), with a minimum amount of change within domestic schemes.

It was not specifically designed to facilitate the cross-border routing of messages within a network.

DESIGN BACKGROUND

The IBAN was designed within the background of growing pressure to improve the efficiency of cross-border payments in regard to cost, speed and quality. Such improvements require, among other things, easier validation of foreign account numbers. The IBAN design provides a standard method to enable the cross-border account number formats to be recognised and validated.

In effect, the IBAN is additional information put on the front of the national account number format2 of each country.

Validation is performed by check digits and a single, simple, algorithm. The algorithm covers the whole IBAN, and ensures, for example, that individual digits are not transposed.

Recognition is in two parts. The IBAN commences with the ISO 3166 two-letter country code. It is therefore easy to recognise the country in which the account is held. Within the national account identifier part of the IBAN, it is an implicit requirement of the ISO standard that the bank be unambiguously identified.

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[1] STP means processing a cross-border retail payment from debiting the ordering customer to crediting the beneficiary customer automatically, i.e. without specific human attention or manual intervention.

[2] A single international format for the whole account number was an idea rapidly discarded as infeasible and impractical.

STRATEGIC REASON(S)

Customers, particularly private individuals and Small/Medium Sized Enterprises (SMEs), are puzzled when receiving invoices from abroad. They are not familiar with the different structures of bank/branch and account identifiers in different countries. As a result the information they give on payment orders is, in many cases, an incomplete or incorrect set of the data elements required for cross-border STP. The subsequent correction is a major contributor to the significant difference between the cost of cross-border payments and domestic payments, and also leads to delays.

In contrast, the specification of bank and account identifiers on domestic payment orders is close to 100% correct. Each individual country is effectively a controlled environment where all of the parties involved in the payment process know and follow the national standards and operational rules, as a result the appropriate data elements are communicated.

The IBAN standard was created to solve the cross-border problem. When implemented and used widely, IBAN will greatly enable the end-to-end STP of cross-border transfers.

POTENTIAL

The IBAN is, first and foremost, an account identifier.

Its adoption is being driven within Europe, as it is supportive towards monetary union and the preparation of a "Euro-domestic" payment system. The IBAN contains all information needed to route a payment order through any national clearing system (i.e., national bank code – also called clearing or sorting code – and the account number itself). Thus the IBAN could, given clearing system changes, be used to feed inbound foreign payments to the national clearing system without any preceding table conversion – as is done today when the beneficiary's bank is identified by the BIC[3].

However, at the present time, there is only a very scant awareness of the ISO standard worldwide. It will take considerable effort, and an essentially long elapsed time[4], before IBANs are used in a majority of worldwide cross-border transactions.

It is therefore somewhat too early to consider IBAN as a cross-border routing tool in the short-to medium term. But it is fruitful to think about the implications of adopting the IBAN as a routing tool eventually, in order to create a long-term strategic plan.

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3   The BIC (Bank Identifier Code), also known as the SWIFT code, identifies a bank, e.g., BANKBEBB, and is defined in ISO standard 9362.

4   A conservative estimate is between 5 and 10 years.

CROSS-BORDER ROUTING

Banks want to avoid intermediaries in order to reduce the time taken in processing commercial payments to a minimum. Consequently they wish to address payment messages directly to the beneficiary's bank or, in the case of mass payments, to a preferred correspondent bank in the country of the beneficiary's bank.

The BIC code of the beneficiary's bank will be required alongside the IBAN because the IBAN cannot be used as a routing tool until:

- there is a wide-spread adoption of IBANs across the world;

- IBANs are validated on input of payment orders/credit transfers for processing;

- the routing mechanisms are generally able to recognise and interpret IBANs from all over the world.

The routing mechanisms will need to be able to interpret all IBANs to optimise network routing. As a first, simple, stage they will need to recognise the country code. At the second, more sophisticated, stage they will need to recognise the bank identification within that country by understanding the various national formats[5].

The routing mechanism operating outside the destination country initially only needs to recognise the destination country from the IBAN, in order to pass the transaction cross-border. The ordering bank then has the choice of sending the payment to their contractual partner in that country (mass payments), or sending the payment direct to the beneficiary's bank on establishing its identity within the destination country (direct routing). Only the routing mechanism operating inside the destination country needs to know the full construction of its own country's BBAN. It also needs access to the authoritative and up-to-date version of its own country's 'sort code directory' or equivalent.

Until IBAN can be used with confidence as a routing tool, it is essential to rely

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[5] Some national account number format(s) may need adaptation in order to achieve clear and easy recognition of the account-holding bank. As defined in this standard this means for each country, that the bank identification is:

- in a fixed position in the BBAN (Basic, or national, Bank Account Number

- has a fixed length

- is unique by bank.

For example, the UK and Netherlands have already prefaced their national account number format with the first four letters of the BIC in order to give the clarity required by the standard.

on the BIC of the beneficiary's bank as, for example, in S.W.I.F.T. FIN messages. Therefore we have to accept a period while such BIC codes will run alongside IBANs, and the inherent redundancy of the two overlapping concepts, while IBAN adoption spreads across the world. For example, the International Payment Instruction (IPI) described in ECBS document EBS206 supports the combination of IBAN and BIC. We also have to accept that at some, probably relatively distant, future point the banking community will have to convince and request S.W.I.F.T. to make the BIC an optional field overriding the IBAN rather than a mandatory field regardless of whether the account number is an IBAN or not. (BICs may continue to be required by specific applications, even if S.W.I.F.T. does not.)

1   INTRODUCTION

This European Standard provides an international standard account identifier, the IBAN (International Bank Account Number) for identifying an account held by a financial institution, in order to facilitate automated processing of (cross-border) transactions through:

- automatic processing of foreign bank account identifications;

- uniform validation of foreign bank account identifications;

- easy routing of transactions.

The IBAN can be implemented without modification to domestic account numbers or account number formats. It achieves this by creating a standard prefix after which the domestic account number can sit unchanged.

2   SCOPE

2.1   Except for the paper format (see 5.2) this standard conforms in all respect with the IBAN specifications from ISO 13616 to which supplementary ECBS specifications are added. These supplementary specifications are:

- alpha characters are in upper case;

- the IBAN is fixed in length, for each country code prefix;

- the bank identifier, as contained in the IBAN, is fixed in length and fixed in position, for each country code prefix;

- a standard format is specified for the paper representation of IBAN.

2.2   The Standard describes methods of composing and validating IBANs in both electronic and paper format.

2.3   Clause 7 incorporates some general operational rules, which are an inherent part of this ECBS Standard, to be applied in all cases of conformance with the standard.

3   NORMATIVE REFERENCES

ISO 3166:   Codes for the representation of countries

ISO 7064:   Data processing - Check character systems

ISO 13616:   Banking and related services - International Bank Account Number (IBAN)

4 DEFINITIONS

4.1 BASIC BANK ACCOUNT NUMBER (BBAN)

The BBAN (Account Number) is the identifier used by financial institutions in individual countries as part of a National Account Numbering Scheme(s) which uniquely identifies an account of a customer at a financial institution.

4.2 CAPTURE OF IBAN

The process of converting an IBAN from paper to electronic format.

4.3 GENERATION OF IBAN

The one time process of creating an IBAN for an account.

4.4 INTERNATIONAL BANK ACCOUNT NUMBER (IBAN)

An expanded version of the Basic Bank Account Number (BBAN) used internationally to uniquely identify the account of a customer at a financial institution.

4.5 TRANSFER OF IBAN

Transport of the IBAN in an operational message

5 THE IBAN FORMAT

5.1 THE ELECTRONIC FORMAT

5.1.1 Up to 34 contiguous alphanumeric characters containing the following consecutive components:

- country code : 2 letter country code as specified in ISO 3166, of the country in which the bank/branch servicing the IBAN resides;

- check digits : 2 digits calculated as specified in clause 6;

- Basic Bank Account Number (BBAN): up to 30 alphanumeric characters, 0-9, A-Z (only uppercase), no separators.

5.1.2 The BBAN has a fixed length per country.

5.1.3 The BBAN includes an explicit identification code of the bank/branch servicing the account at fixed positions within the BBAN, specified per country.

5.2 THE PAPER FORMAT

The paper representation of the IBAN is the same as the electronic format except that the IBAN shall be split up in groups of 4 characters separated by a space. The last group shall be variable in length, up to 4 characters.

In the ISO 13616 Standard a tag precedes the IBAN. On this point the ECBS Standard deviates from the ISO Standard.

5.3 EXAMPLES OF IBANS

Country	BE	FR
Account number	510-0075470-61	20041 01005 0500013M026 06
Electronic IBAN	BE62510007547061	FR1420041010050500013M02606
Paper IBAN	BE62 5100 0754 7061	FR14 2004 1010 0505 0001 3M02 606

6 CALCULATION AND VALIDATION OF THE CHECK DIGITS

6.1 METHOD OF VALIDATING THE CHECK DIGITS

<u>Preliminary step</u>

If the IBAN is in paper format, convert to basic format by deleting all non-alphanumeric characters.

BE62 5100 0754 7061 becomes BE62510007547061

<u>Step 1</u>

Move the first four characters of the IBAN to the right of the number.

Result = 510007547061BE62

<u>Step 2</u>

Convert the letters into numerics in accordance with the conversion table under 4.3.

Result = 5100075470611111462

<u>Step 3</u>

Apply MOD 97-10 (see ISO 7064). For the check digits to be correct, the remainder after calculating the modulus 97 must be 1.

The remainder of the division of 5100075470611111462 by 97 = 1

6.2 METHOD OF CALCULATING THE CHECK DIGITS

<u>Preliminary step</u>

Create an artificial IBAN composed of the country code (ISO 3166) followed by "00" and the BBAN (without non-alphanumeric characters).

A Belgian BBAN 510-0075470-61 becomes BE00510007547061

<u>Step 1</u>

Move the first four characters of the IBAN to the right of the number.

Result = 510007547061BE00

<u>Step 2</u>

Convert the letters into numerics in accordance with the conversion table

under 6.3.

Result = 510007547061111400

Step 3

Apply MOD 97-10 (see ISO 7064).

Calculate the modulo 97 and subtract the remainder from 98. If the result is one digit, then insert a leading zero.

98 - 36 = 62 so IBAN = BE62510007547061

6.3   ALPHA TO NUMERIC CONVERSION TABLE

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

Note: Implementation note for modulo 97 calculations

For reasons of precision, the use of integers instead of floating point numbers is recommended. If the number is too long for the software implementation of integers (a (signed) integer of 32 bits or 64 bits represents a maximum of 9 or 18 digits), then the calculation can be split up into consecutive remainder calculations on integers with a maximum length of 9 or 18 digits.

The remainder of the division of 510007547061111462 by 97 = 1

- Calculate the modulo 97 of the first 9 (or 18) digits of the number.

- modulo 97 of 510007547 = 74

- Construct the next integer of 9 (or 18) digits from the remainder, followed by the next 7/8 (or 16/17) digits of the number. Calculate the modulo 97.

- modulo 97 of 740611114 = 12

- Repeat step 2 until all the digits of the number have been processed.

- modulo 97 of $\underline{12}62 = 1$

7 OPERATIONAL RULES & GUIDELINES

7.1   Generation of the IBAN shall be the exclusive responsibility of the bank/branch servicing the account.

7.2   Every capturing system shall validate the IBAN i.e. when transferring the IBAN from paper to electronic form.

7.3   The IBAN shall always be transferred completely to the next party in the processing chain, at least until the entry-point in the country of the beneficiary.

INFORMATIVE ANNEX

It is strongly recommended that creditors use the IPI (International Payment Instruction – EBS206) for communicating the IBAN, their bank's BIC code and all other relevant data for submitting credit transfer orders in a structured way to their debtors.

While creditors do not (yet) distribute IPIs they should indicate the IBAN as well as their bank's SWIFT code (BIC) on their letterheads and invoices, in the same way as they indicate data like the account number, telephone number or Chamber of Commerce number.

Example:

Customer Inc.	**}**	
12, Main Street	**}**	(no need for explanation; just the data itself)
City, Country	**}**	

Telephone	:
Chamber of Commerce	:
Bank account number	:
Bank's SWIFT code (BIC)	:
IBAN	:

The use of a colon to separate the IBAN tag from the IBAN itself should exclude the risk that the debtor would copy the IBAN tag as part of the IBAN account number.