

Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT) – part 1



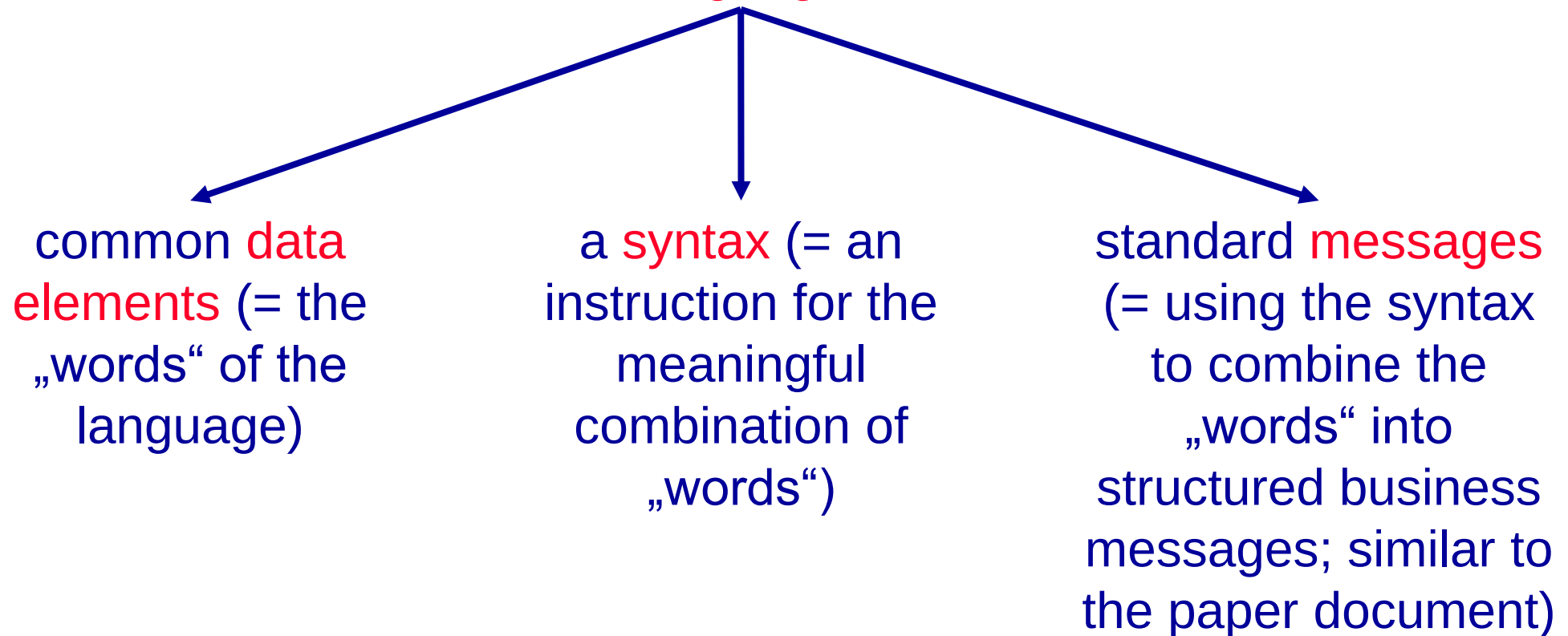
UN/EDIFACT



EDIFACT (= „Electronic Data Interchange for Administration, Commerce and Transport“)

... is an international standard, that describes the structure of an ASCII file („flat file“), that contains a message of a certain type (for example a booking, an invoice, a bayplan, ...)

Common understanding by a common language



see: D00A; D210.TXT; chapter II

Definition

1. Example
2. Who „makes“ EDIFACT ?
3. Other standards
4. The ISO standard 9735
5. Message structure (ISO 9735-2)
6. The UN documents
7. Subsets
8. The implementation guide

separators



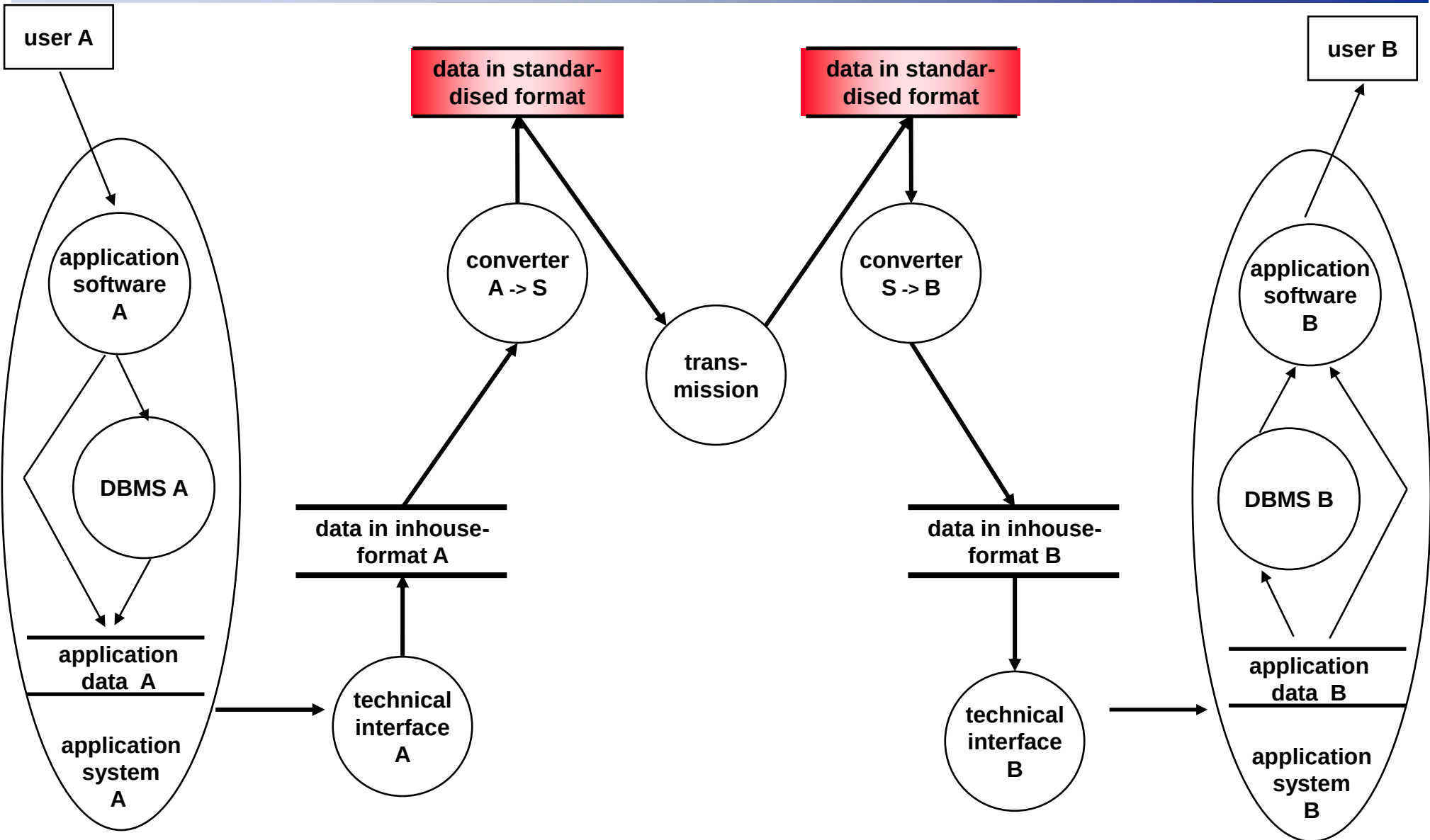
An example: COARRI (container discharge/loading report)

```
UNH+SN241445110001+COARRI:D:95B:UN:EUIND12'  
BGM+119+20035550001+9+AB'  
FTX+OSI++D'  
RFF+XXX:1'  
TDT+20+W594+1+8+MAE:172:20:MAERSK++6212771:146:11:SL PRIAM:US'  
RFF+VON:45N567'  
LOC+11+INMAA:139:6:CHENNAI+CCT:72:6:CHENNAI CONTAINER TERMINAL'  
DTM+137:2003062516520530:205'  
NAD+CF+OCL:160:20++OVERSEAS CONTAINERS'  
EQD+CN+OCLU5673214+2210:102:5+2+3+5'  
RFF+ BN:OCMA54321'  
TMD+3++1'  
DTM+403:2003062418330530:205'  
LOC+147+0150306::5'  
MEA+WT+G+KGM:17500'  
DIM+13+CMT:::25'  
TMP+2+-2.5:CEL'  
RNG+5+CEL:-3.5:-1.5'  
SEL+OC34987+CA::OVERSEAS CONTAINERS+1'  
FTX+HAN+RCT'  
DGS+IMD+3+2348+037:CEL:3'  
EQA+RG+OCRG553328'  
DAM+1+XXX++DENTS AND HOLES'  
TDT+30++3+31+:::SMITH ROADWAYS'  
LOC+8+KDL:269:ZZZ: KINLEY DISTRIBUTION'  
DTM+133:2003062412000530:205  
NAD+CF+OCL:160:20'  
CNT+16:27'  
UNT+32+ SN241445110001'
```

An example: COARRI (container discharge/loading report)

UNH+SN241445110001+COARRI:D:95B:UN:EUIND12'BGM+119+2003555000
1+9+AB'FTX+OSI++D'RFF+XXX:1'TDT+20+W594+1+8+MAE:172:20:MAERSK
++6212771:146:11:SL PRIAM:US'RFF+VON:45N567'LOC+11+INMAA:139:
6:CHENNAI+CCT:72:6:CHENNAI CONTAINER TERMINAL'DTM+137:2003062
516520530:205'NAD+CF+OCL:160:20++OVERSEAS CONTAINERS'EQD+CN+O
CLU5673214+2210:102:5+2+3+5'RFF+BN:OCMA54321'TMD+3++1'DTM+403
:2003062418330530:205'LOC+147+0150306::5'MEA+WT+G+KGM:17500'D
IM+13+CMT:::25'TMP+2+-2.5:CEL'RNG+5+CEL:-3.5:-1.5'SEL+OC34987
+CA::OVERSEAS CONTAINERS+1'FTX+HAN+RCT'DGS+IMD+3+2348+037:CEL
:3'EQA+RG+OCRG553328'DAM+1+XXX++DENTS AND HOLES'TDT+30++3+31+
:::SMITH ROADWAYS'LOC+8+KDL:269:ZZZ: KINLEY DISTRIBUTION'DTM+
133:2003062412000530:205NAD+CF+OCL:160:20'CNT+16:27'UNT+32+ S
N241445110001'

An example: COARRI (container discharge/loading report)



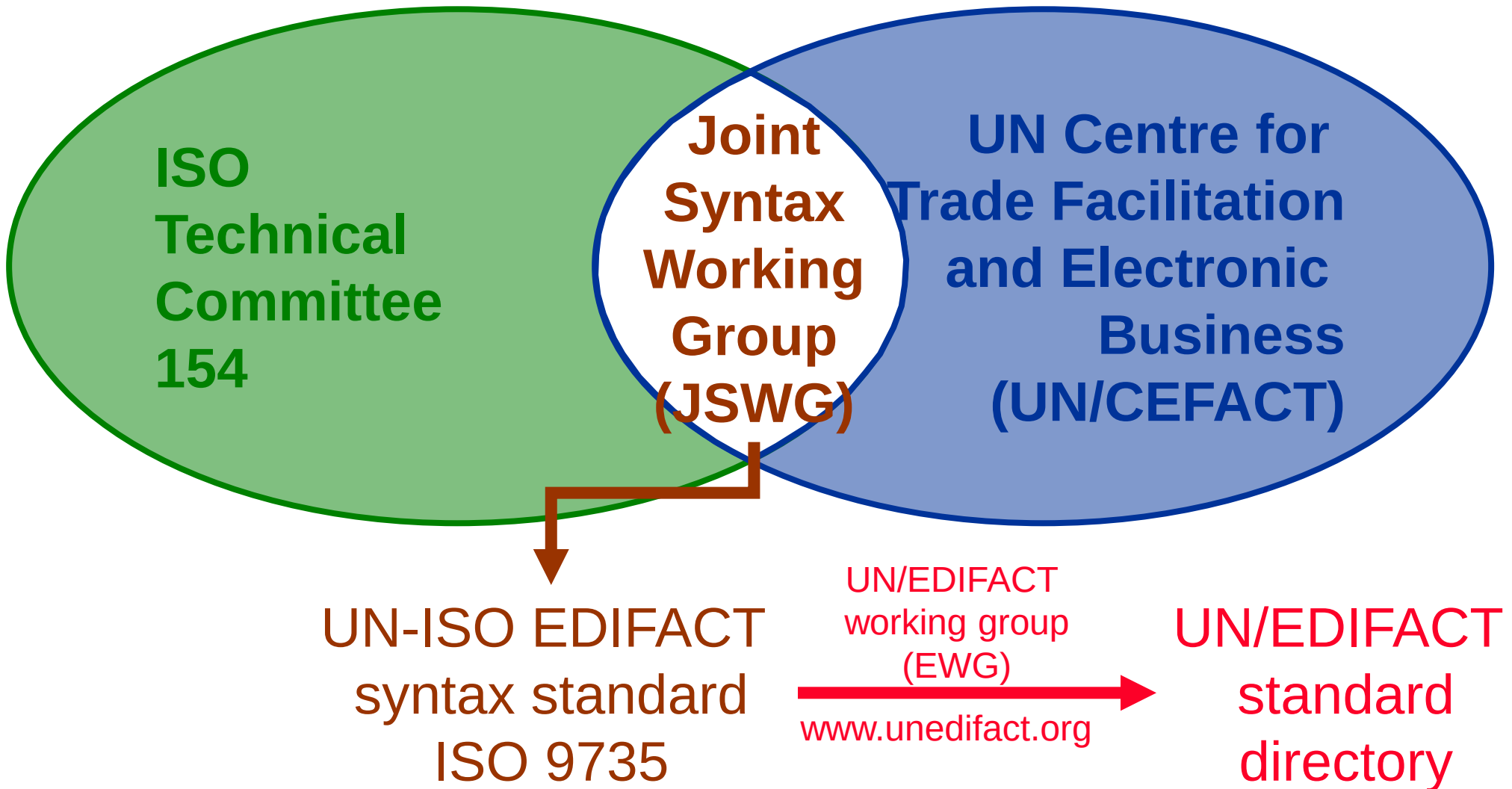
For remembrance: EDI

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www.iso.org/tc154

www.gefeg.com/jswg/

www.unece.org/cefact/



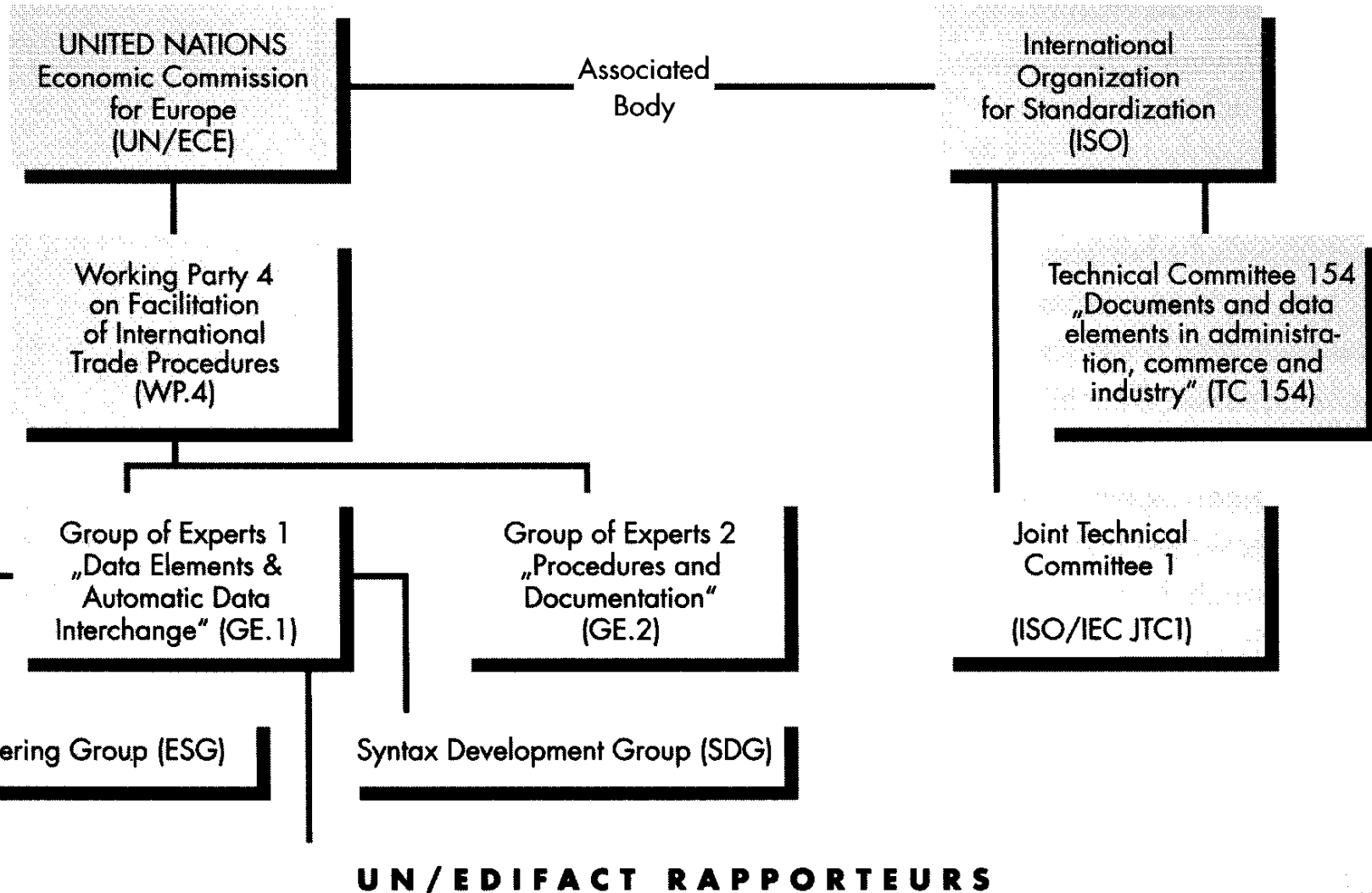
Who „makes“ EDIFACT ?

source: D100-Introduction.TXT (2., 3., 4.)

1. Proposal stage
2. Preparatory stage
3. Committee stage
4. Enquiry stage
5. Approval stage
6. Publication stage

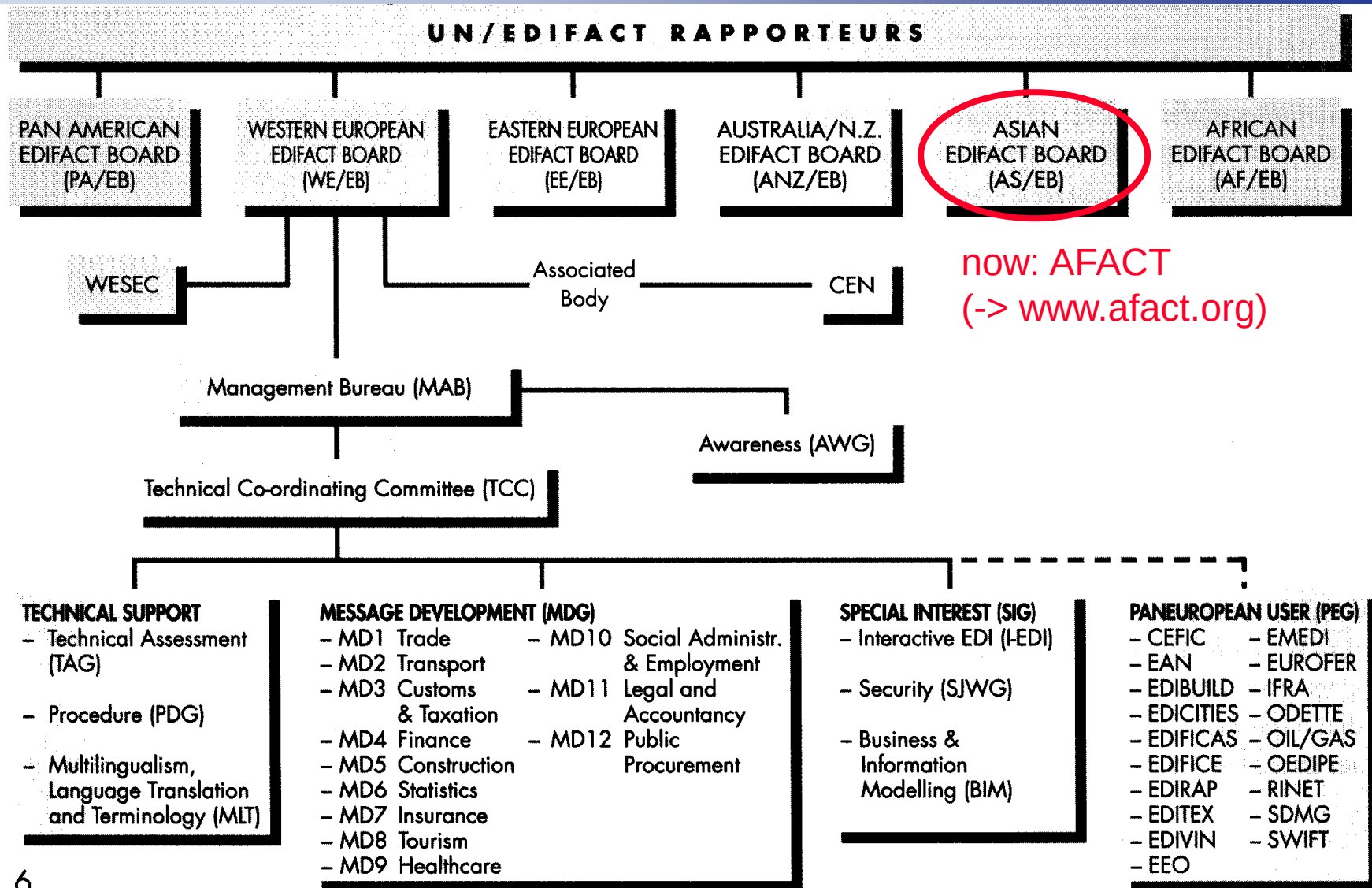
source: www.gefeg.com/jswg, see also EDIFACT.doc

ISO Stages of the development of International Standards



Quelle: Broschüre „EDI und EDIFACT für Einsteiger“ der DEDIG, S. 6

Who „makes“ EDIFACT ?



6

Quelle: Broschüre „EDI und EDIFACT für Einsteiger“ der DEDIG, S. 6

Who „makes“ EDIFACT ?

United Nations Directories for Electronic Data Interchange for Administration, Commerce and Transport - Mo...

File Bearbeiten Ansicht Chronik Lesezeichen ScrapBook Extras Hilfe

http://www.unece.org/trade/untdid/welcome.htm

iso tc 154 - Google-Suche DIN Deutsches Institut für No... United Nations Directories ...

UNECE United Nations Economic Commission for Europe

SEARCH SITE MAP

HOME PROGRAMMES MEETINGS INFORMATION RESOURCES ABOUT UNECE CONTACT UNECE

UN/EDIFACT

UN/EDIFACT Main Page
Introduction and Rules
Directories
Service codes
Directory Maintenance
Request (DMR) statuses
Messages in Development (MID)
Order form
UN/EDIFACT sitemap

United Nations Directories for Electronic Data Interchange for Administration, Commerce and Transport

UN/EDIFACT Standard Directories

Directories - HTML files
Download Directories - ZIP files
Message Implementation Guides
Archives of earlier directories
Directory Audit Team Reports

2006

The D.06A UN/EDIFACT directory now available. The latest version of the UN/EDIFACT directories is now available for download from the UNECE Web Server.

25 January

The D.05B UN/EDIFACT directory now available.

2005

25 July

The D.05A UN/EDIFACT directory now available.

20-21 June

Paperless Trade in International Supply Chains - Enhancing Efficiency and Security

Suchen: bür Abwärts Aufwärts Hervorheben Groß-/Kleinschreibung

Fertig

UNTDID =

„UN
Trade
Data
Interchange
Directory“

The screenshot shows a Mozilla Firefox browser window displaying the website of the Deutsches Institut für Normung e. V. (DIN). The browser's address bar shows the URL <http://www.nbue.din.de/>. The website's header includes the DIN logo and the text 'Deutsches Institut für Normung e. V.' along with logos for CEN, ISO, and a shopping cart icon. A navigation bar contains links for 'DIN', 'Normung', 'Beuth Verlag', 'Zertifizierung', 'Service', and a search bar with 'edifact' entered. A left sidebar lists various topics, with 'Elektronisches Geschäftswesen' highlighted. The main content area is titled 'Elektronisches Geschäftswesen' and contains the following text:

Der Arbeitsausschuss "Elektronisches Geschäftswesen" (NBü-AA 3) beschäftigt sich mit Normungsvorhaben um das Thema EDI und eBusiness. Er leitet und koordiniert die Aktivitäten der untergeordneten Arbeitskreise (AKs). Darüber hinaus ist der NBü-AA 3 das nationale Bindeglied zu den fachbezogenen internationalen Normungsgremien sowohl bei CEN (z. B. [eBES Workshop](#)) und ISO ([TC 154](#)) als auch bei [UN/CEFACT](#).

Obmann des NBü-AA 3: Hans-Jürgen Rosenberg, Atos Origin

Kontakt im DIN:
Dipl.-Ing. [Bernd Bösler](#)
Normenausschuss Bürowesen (NBü)
Tel.: 030 2601-2488
Fax: 030 2601-42488
[E-Mail](#)

The browser's status bar at the bottom shows a search for 'bür' and the URL <http://www.nbue.din.de/sixcms/detail.php?id=7072>.

EDIFACT beim Normenausschuss „Bürowesen“ des DIN

ABK Systeme,
APCON Professional Concepts,
Atos,
AUSTRIAPRO (Österreich),
BAYER,
Bayerische Vereinsbank,
BfA Bundesversicherungsanstalt für Angestellte,
BMF Bundesministerium der Finanzen,
BMVBW Bundesministerium für Verkehr, Bau- und Wohnungswesen,
BMW Bundesministerium für Wirtschaft und Technologie,
BSL Bundesverband Spedition und Logistik,
Bundesamt für Finanzen,
Bundesministerium für wirtschaftl. Angelegenheiten (Österreich),
Bundesverband deutscher Banken (BdB),
BWS Buchungszentrale der Westfälisch-Lippischen Sparkassen,
COMMERZBANK,
csg Computer Service,
DaimlerChrysler,
DAKOSY,
DATEV,
DB Cargo,
DE-PRO,
debis IT Security Services,
Deutsche Bundesbank,
Deutsche Telekom,
Deutsche Bank,
Deutsche Post,
DKV Deutsche Krankenversicherung,
Dr. Materna,
Dresdner Bank,
DRK Krankenhaus,
DSGV Deutscher Sparkassen- und Giroverband,
Freudenberg Informatik,
GE Information Services,
GEFEG

Gemeinnützige Urlaubskasse für das Maler- und Lackiererhandwerk,
GLI,
Hapag Lloyd,
HypoVereinsbank,
ITEK,
Karstadt,
Kassenärztliche Bundesvereinigung,
Lombardkasse,
MOSAIC Software,
NAME Normenausschuß Medizin,
NDWK Normenausschuß für Daten- und Warenverkehr in der Konsumgüterwirtschaft,
Nedlloyd NTO,
NI Normenausschuß Informationstechnik,
OCS Unternehmensberatung,
OFD Frankfurt,
OFD Düsseldorf,
Quasar Microcomputer,
SAP,
Siemens Business Services,
Siemens,
Sigma Aldrich Chemie,
SinnLeffers,
SIZ Informatikzentrum der Sparkassenorganisation,
Sozialkasse des Berliner Baugewerbes,
Statistisches Bundesamt,
Telenet,
TOSHIBA Electronis Europe,
ULAK Urlaubs- und Lohnausgleichskasse der Bauwirtschaft,
United Parcel Service,
VDA Verband der Automobilindustrie,
VDR Verband Deutscher Rentenversicherungsträger,
VISER Systemintegration,
VÖB Verband öffentlicher Banken,
Volkswagen,
Wirtschaftsvereinigung Stahl

Quelle: <http://www.din.de/set/gremien/nas/>

Der Normenausschuß „Bürowesen“ beim DIN (Mitglieder)



**Ship
Message
Development
Group**

User Group for Shipping Lines and Container Terminals



**THE
INTERNATIONAL
TRANSPORT
IMPLEMENTATION
GUIDELINES
GROUP**

www.smdg.org and www.smdg.org/itigg

- www.gefeg.com/jswg (ISO 9735 standard)
- www.unedifact.org (EDIFACT directories)
- www.din.de (Germany)
- www.afact.org (Asia)
- www.smdg.org (shipping messages)
- www.smdg.org/itigg (transport)
- and so on, and so on , ...

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IATA-EDI („International Air Transport Association“)

one of the first EDI-Applications; passenger- and goods transport and spare part ordering; partially transition to EDIFACT; Interactive EDIFACT
(www.iata.org/ia/interact.htm)

ODETTE („Organisation for Data Exchange Through Tele-transmission in Europe“)

one of the first EDI-Applications; automotive industry (invoices, orders, ...); special transmission protocol: OFTP; partially transition to EDIFACT

SWIFT ("Society for Worldwide Interbank Financial Telecommunications")

one of the first EDI-Applications; automatic encryption before transmission + safety against changes during transmission; thousands of banks, more than 100 message types, millions of messages per day; supports EDIFACT for the interface to enterprises

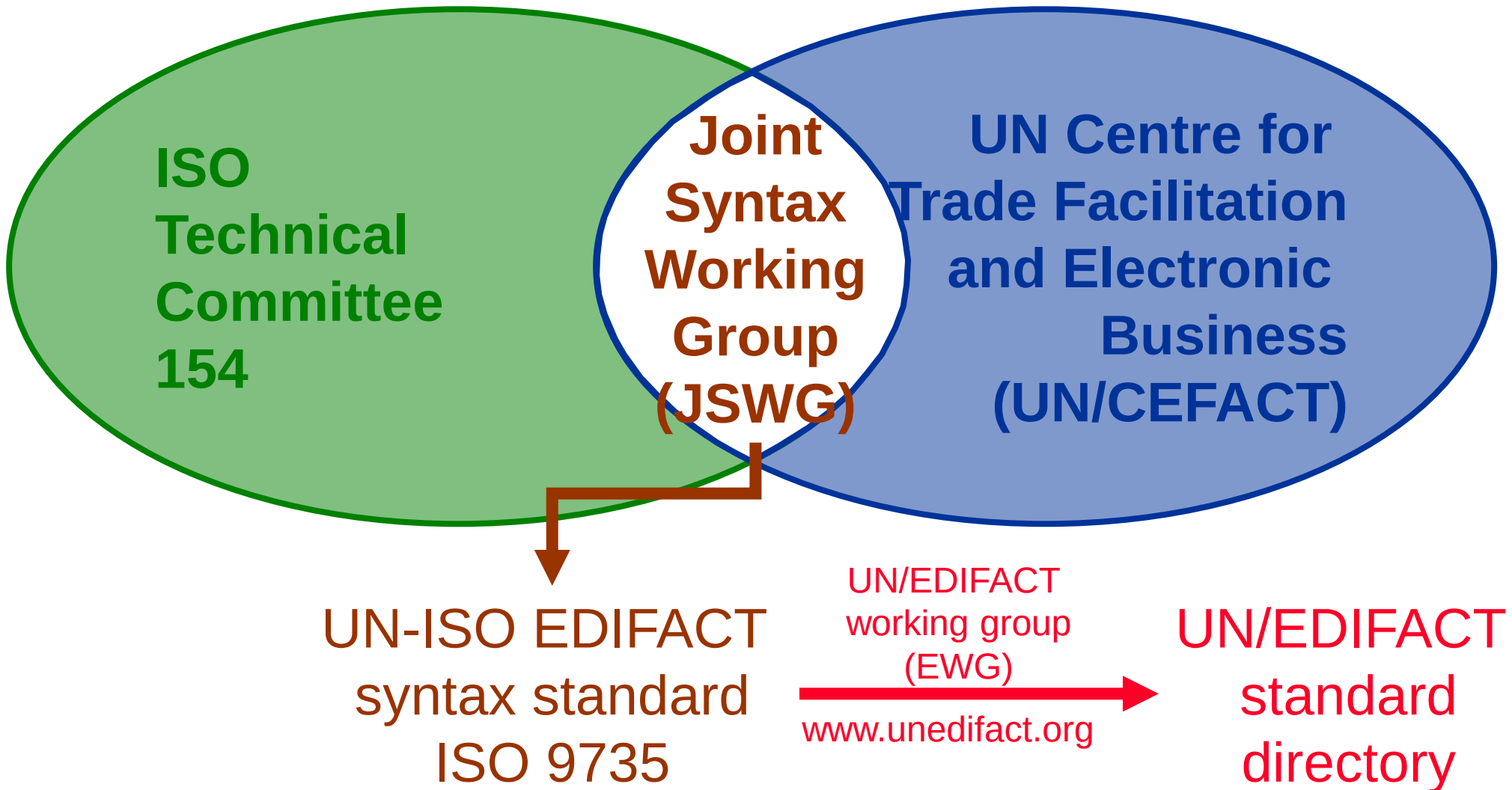
X12 („American National Standards Institute“)

one of the sources of EDIFACT; difference:extensive usage of coded data elements; no composite data elements; applications in many business areas with the focus of trade and transport

see also: <http://www2.echo.lu/oii/en/edi.html>

Other standards

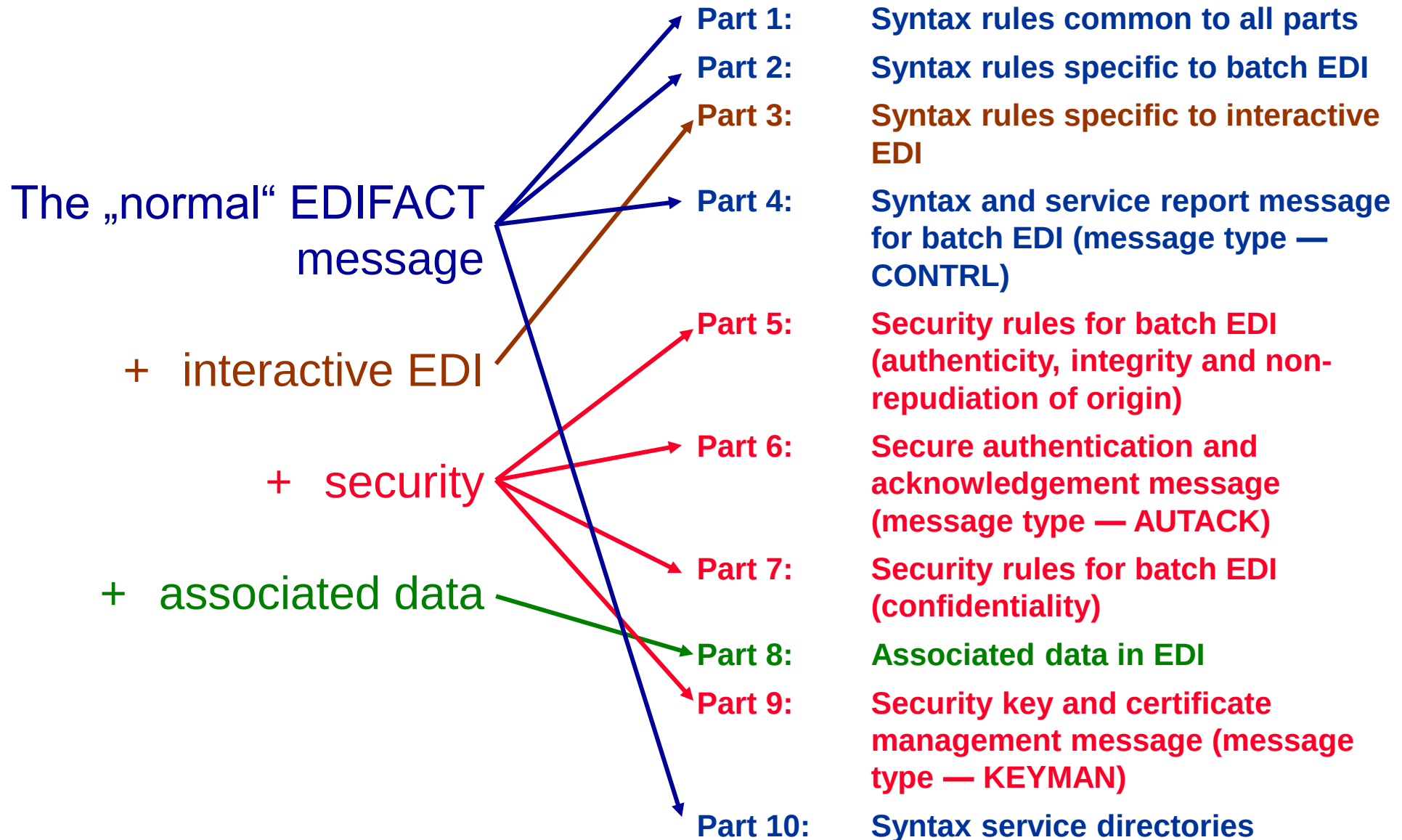
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www.??????.??? www.gefeg.com/jswg/www.unece.org/cefact/

Let's have a look into
ISO 9735 !



The ISO standard 9735:2002 (from www.gefeg.com/jswg)



- interchange, message, segment, data element, ...
- inclusion and exclusion of segments and data elements
- Annex A: The UNA service string
- Annex B: Order of segments within a message
- Annex C: Segment collision

- Part 1:** **Syntax rules common to all parts**
- Part 2:** Syntax rules specific to batch EDI
- Part 3:** Syntax rules specific to interactive EDI
- Part 4:** Syntax and service report message for batch EDI (message type — CONTRL)
- Part 5:** Security rules for batch EDI (authenticity, integrity and non-repudiation of origin)
- Part 6:** Secure authentication and acknowledgement message (message type — AUTACK)
- Part 7:** Security rules for batch EDI (confidentiality)
- Part 8:** Associated data in EDI
- Part 9:** Security key and certificate management message (message type — KEYMAN)
- Part 10:** Syntax service directories

- Batch EDI interchange structure (message group / message / segment / composite data element / component data element)
- UNA (Service String Advice)
- UNB-UNZ (Interchange)
- UNG-UNE (Group)
- UNH-UNT (Message)

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„... shall be used to:

- acknowledge or reject a received interchange, ... and list any syntactical errors or unsupported functionality contained therein, or
- indicate only the receipt of an interchange.“

- | | |
|-----------------|---|
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0010	UNH	Message header	M	1	
0020	UCI	Interchange response	M	1	
0030	———	Segment group 1	C	999999	
0040	UCM	Message/package response	M	1	
0050	———	Segment group 2	C	999	
0060	UCS	Segment error indication	M	1	
0070	UCD	Data element error indication	C	99	
0080	———	Segment group 3	C	999999	
0090	UCF	Group response	M	1	
0100	———	Segment group 4	C	999999	
0110	UCM	Message/package response	M	1	
0120	———	Segment group 5	C	999	
0130	UCS	Segment error indication	M	1	
0140	UCD	Data element error indication	C	99	
0150	UNT	Message trailer	M	1	

UNH
UCI

UCM
UCS
UCD

UCM
UCS

UCM

UNT

UNH
UCI

UCM
UCS

UCM
UCS

UCF
UCM
UCS
UCD

UCF
UCM

UNT

source: ISO 9735-4, p. 10

The CONTRL message

This message structure seems to be
ok – but nevertheless it is wrong !
WHY ??

Tip:
see ISO 9735-4, p. 10
and ISO 9735-1, p. 21

UNH
UCI

UCM
UCS

UCM
UCS

UCF
UCM
UCS
UCD

UCF
UCM

UNT

source: ISO 9735-4, p. 10

The CONTRL message

- „Security services addressed in this part of ISO 9735 shall be provided by the inclusion of security header and trailer segment groups after the UNH and before the UNT“

- | | |
|-----------------|---|
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| Part 10: | Syntax service directories |

TAG	Name	S	R
UNH	Message Header	M	1
----- Segment Group 1 -----			
USH	Security Header	M	1
USA	Security Algorithm	C	3
----- Segment Group 2 -----			
USC	Certificate	M	1
USA	Security Algorithm	C	3
USR	Security Result	C	1

Message body

----- Segment Group n -----			
UST	Security Trailer	M	1
USR	Security Result	C	1
UNT	Message Trailer	M	1

- „AUTACK is a message authenticating sent, or providing secure acknowledgement of received interchanges, groups, messages or packages.“

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- Part 10:** Syntax service directories

a secure
message
according
to part 5 –
with a
special
body

POS	TAG	Name	S	R	Notes
0010	UNH	Message header	M	1	
0020	----	Segment group 1 -----	M	99	-----+
0030	USH	Security header	M	1	
0040	USA	Security algorithm	C	3	
0050	-----	Segment group 2 -----	C	2	-----+
0060	USC	Certificate	M	1	
0070	USA	Security algorithm	C	3	
0080	USR	Security result	C	1	-----+---+
0090	USB	Secured data identification	M	1	
0100	-----	Segment group 3 -----	M	9999	-----+
0110	USX	Security references	M	1	
0120	USY	Security on references	M	9	-----+
0130	-----	Segment group 4 -----	M	99	-----+
0140	UST	Security trailer	M	1	
0150	USR	Security result	C	1	-----+
0160	UNT	Message trailer	M	1	

The AUTACK message

- „Confidentiality of an EDIFACT structure (message, package, group or interchange) shall be provided by encrypting the message body, ..., together with any other security header and trailer segment groups, using an appropriate cryptographic algorithm.“

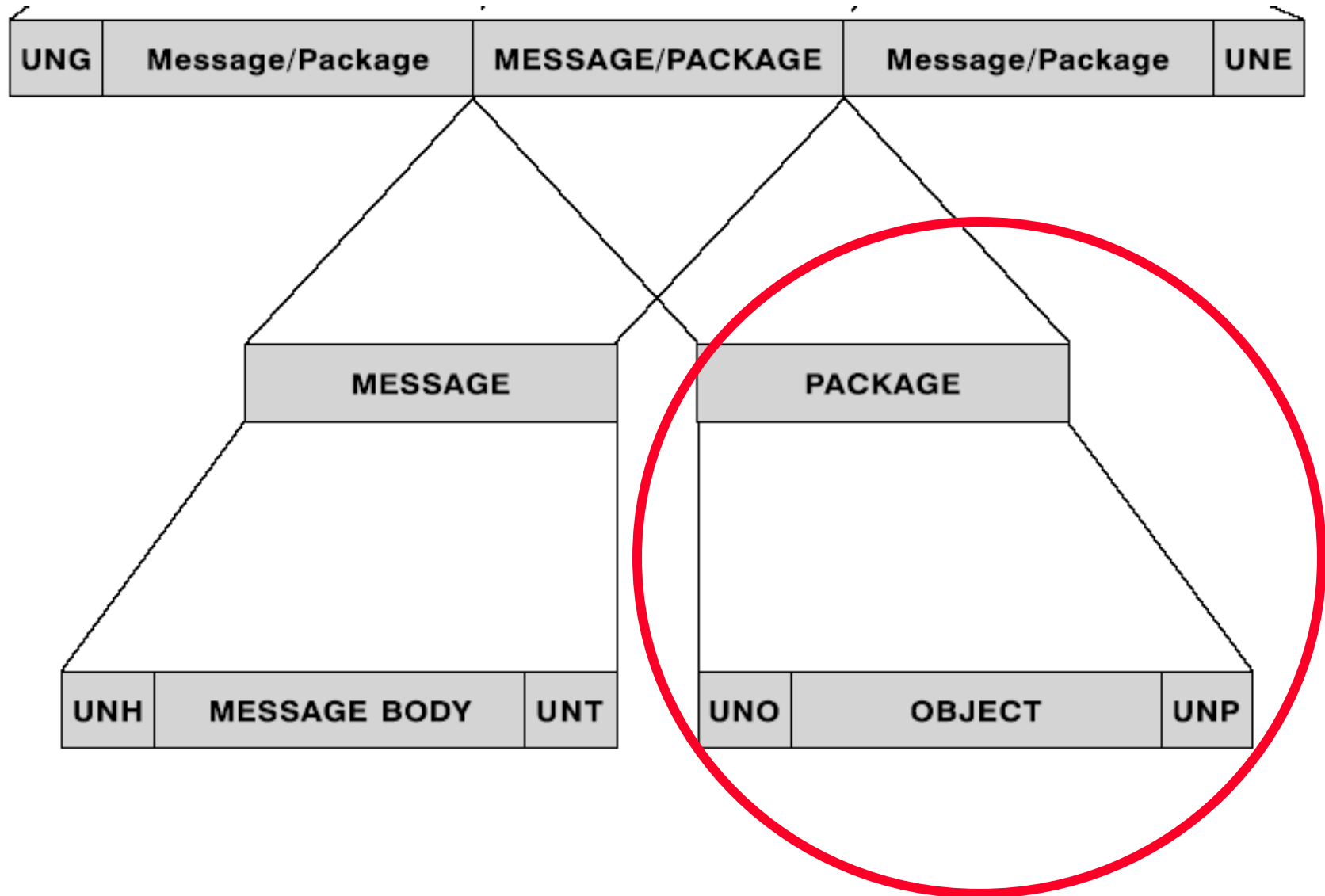
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TAG	Name	S	R
Segment Group 1		C	99
USH	Security Header	M	1
USA	Security Algorithm	C	3
Segment Group 2		C	2
USC	Certificate	M	1
USA	Security Algorithm	C	3
USR	Security Result	C	1
USD	Data Encryption Header	M	1
Encrypted data			
USU	Data Encryption Trailer	M	1
Segment Group n		C	99
UST	Security Trailer	M	1
USR	Security Result	C	1

a secure message according to part 5 – with a special body

- „permits the transfer ... of data which can be created by other applications, such as STEP (STandard for the Exchange of Product model data), CAD (Computer Aided Design), etc., and which cannot be carried by means of an EDIFACT message.“

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source: ISO 9735-8, p. 3

Associated data

- „... may be used to request or deliver security keys, certificates, or certification paths ... and it may be used to deliver lists of certificates
- The KEYMAN message may be secured by the use of security header and trailer segment groups.“

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POS	TAG Name	S	R	
0010	UNH Message header	M	1	
0020	----- Segment group 1 -----	C	999	-----+
0030	USE Security message relation	M	1	
0040	USX Security references	C	1	
0050	----- Segment group 2 -----	M	9	-----+
0060	USF Key management function	M	1	
0070	USA Security algorithm	C	1	
0080	----- Segment group 3 -----	C	1	++
0090	USC Certificate	M	1	
0100	USA Security algorithm	C	3	
0110	USR Security result	C	1	-----+
0120	----- Segment group 4 -----	C	99	-----+
0130	USL Security list status	M	1	
0140	----- Segment group 5 -----	M	9999	--+
0150	USC Certificate	M	1	
0160	USA Security algorithm	C	3	
0170	USR Security result	C	1	-----+
0180	UNT Message trailer	M	1	

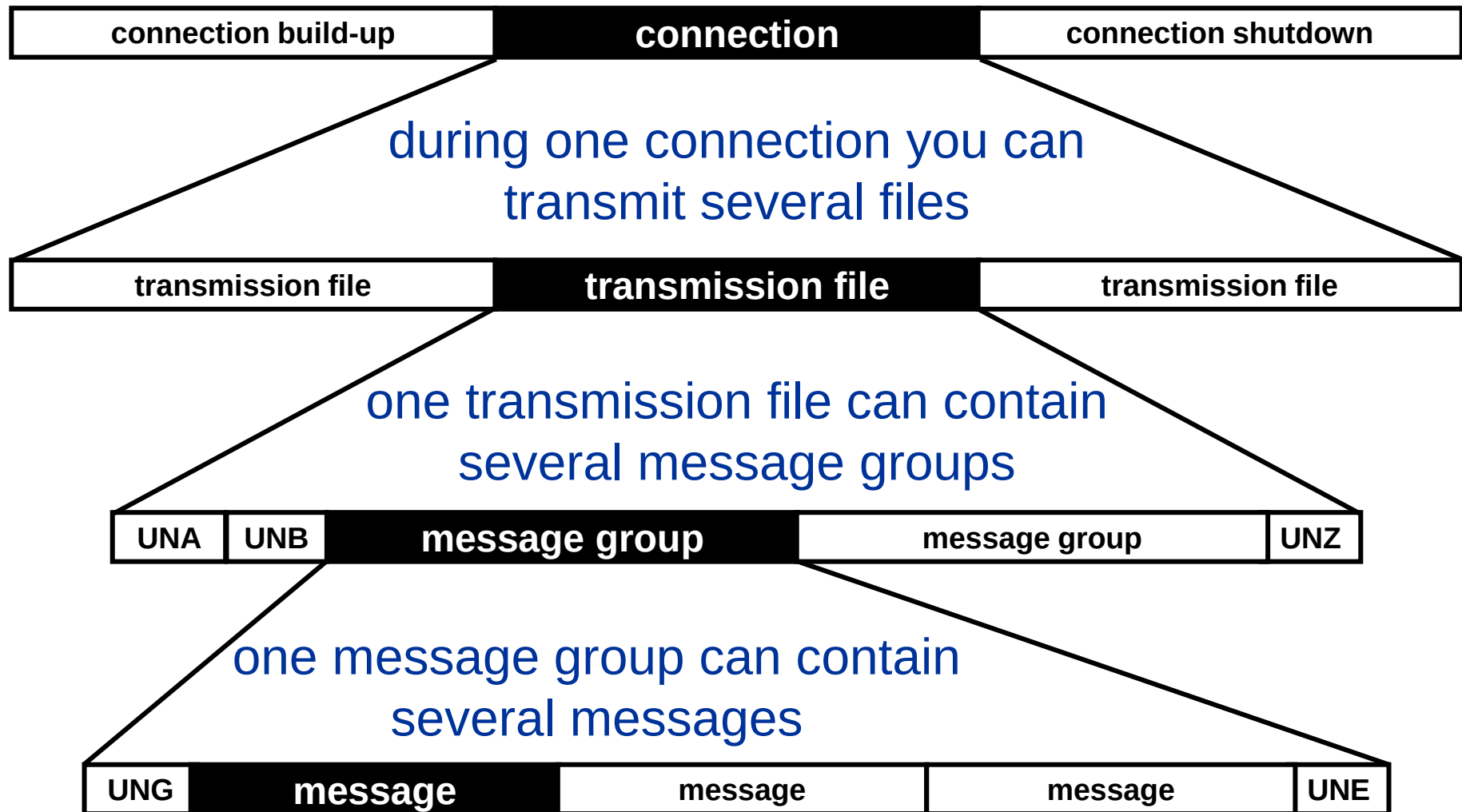
The KEYMAN message

- definitions of the service segments „Uxx“

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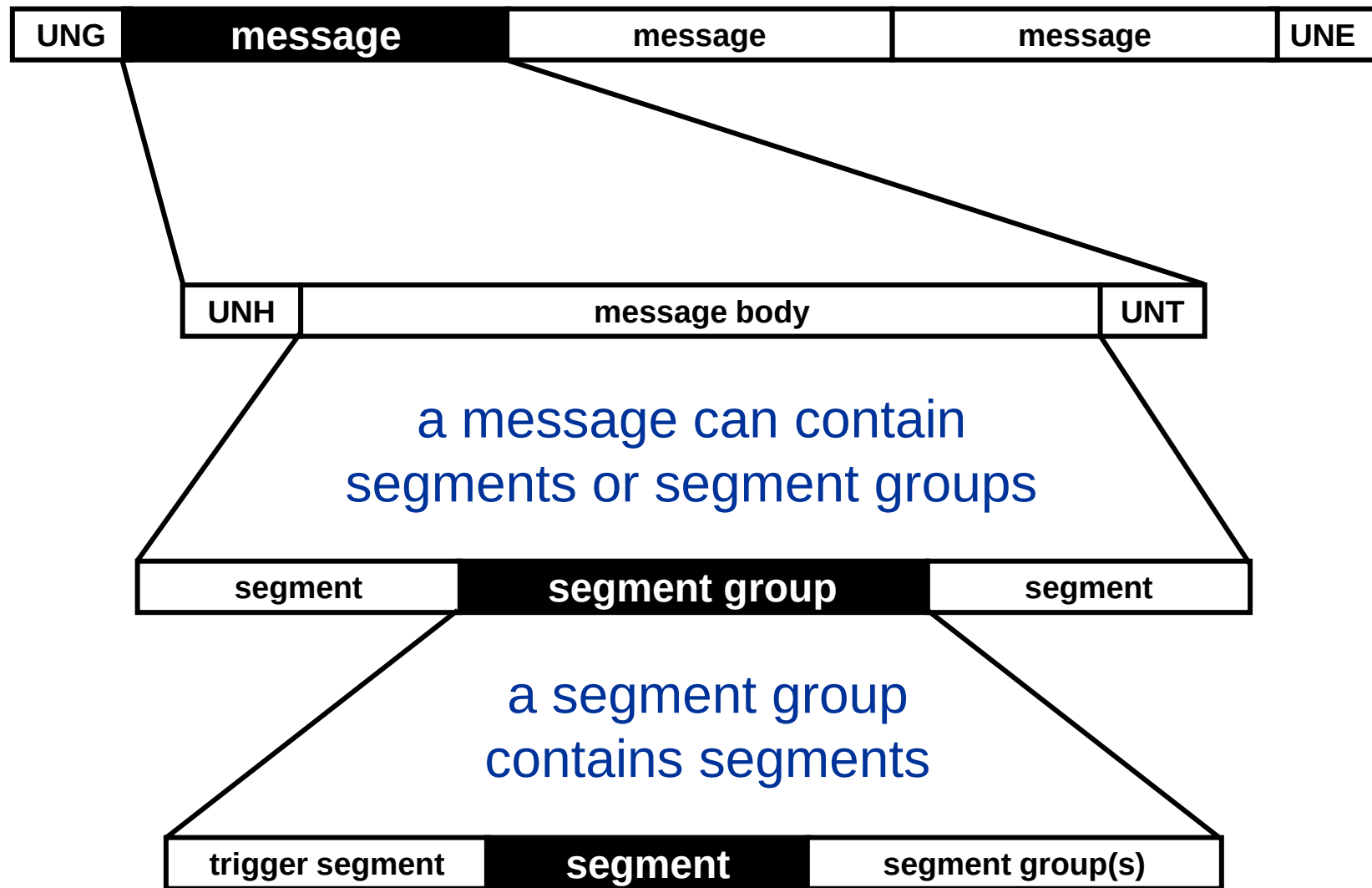
- UCD Data element error indication
- UCF Group response
- UCI Interchange response
- UCM Message/package response
- UCS Segment error indication
- UGH Anti-collision segment group header
- UGT Anti-collision segment group trailer
- UIB Interactive interchange header
- UIH Interactive message header
- UIR Interactive status
- UIT Interactive message trailer
- UIZ Interactive interchange trailer
- UNB Interchange header
- UNE Group trailer
- UNG Group header
- UNH Message header
- UNO Object header
- UNP Object trailer
- UNS Section control
- UNT Message trailer
- UNZ Interchange trailer
- USA Security algorithm
- USB Secured data identification
- USC Certificate
- USD Data encryption header
- USE Security message relation
- USF Key management function
- USH Security header
- USL Security list status
- USR Security result
- UST Security trailer
- USU Data encryption trailer
- USX Security references
- USY Security on references

1. Example
2. Who „makes“ EDIFACT ?
3. Other standards
4. The ISO standard 9735
5. Message structure (ISO 9735-2)
6. The UN documents
7. Subsets
8. The implementation guide



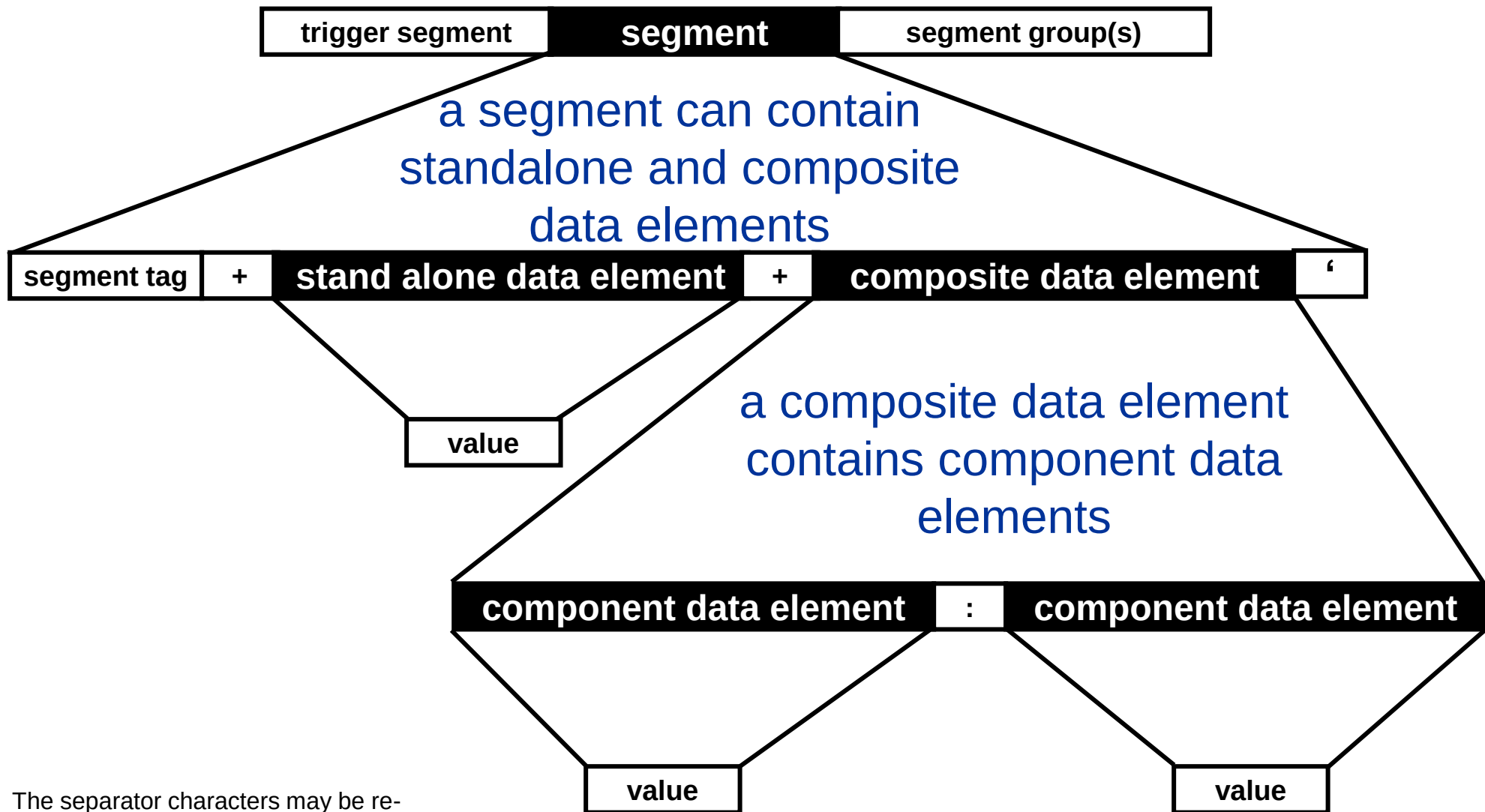
see also ISO 9735-2:2002, p. 4

Message structure



see also ISO 9735-2:2002, p. 4

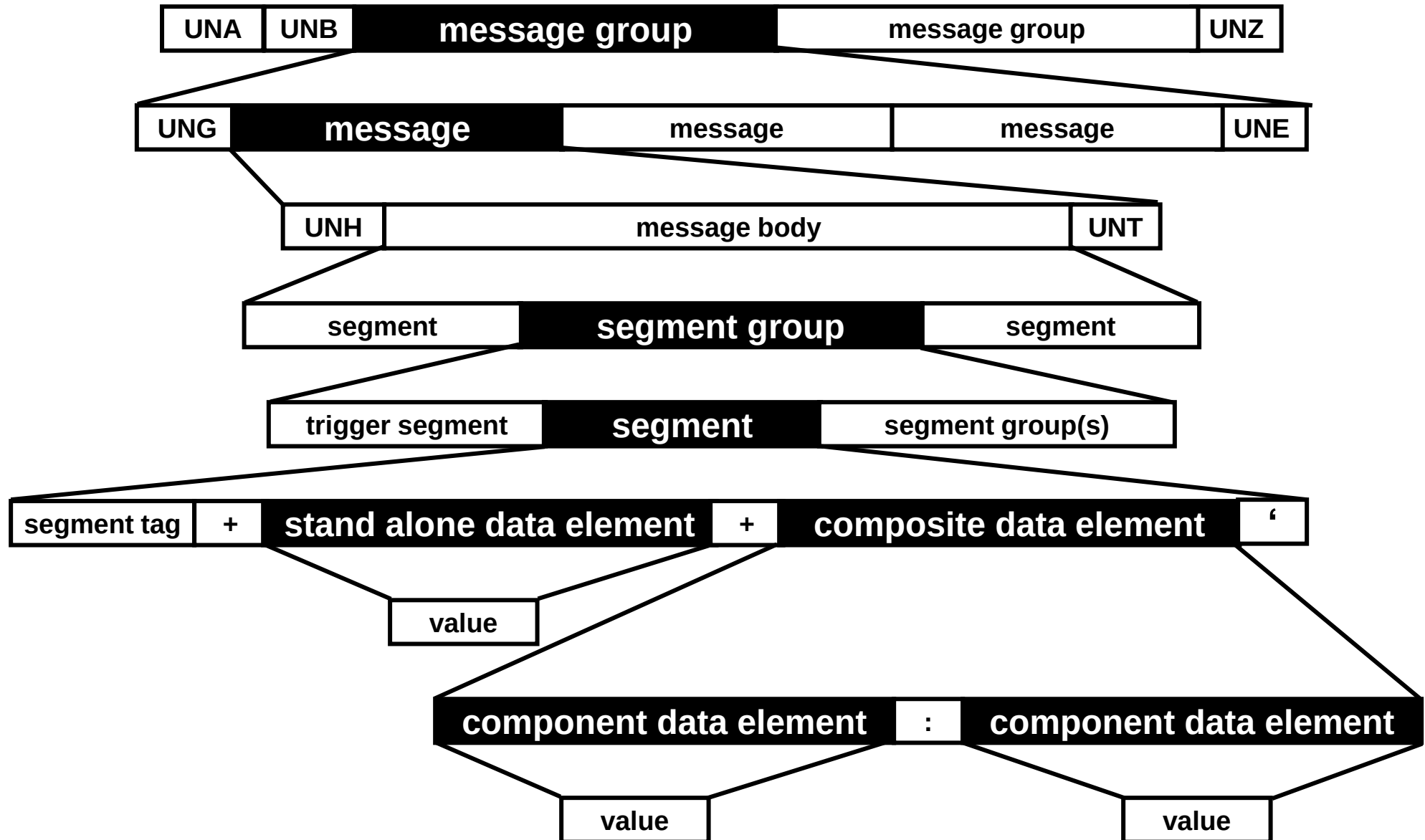
Message structure



The separator characters may be re-defined with UNA (=„Service String Advice“) – see ISO 9735-1 Annex A !

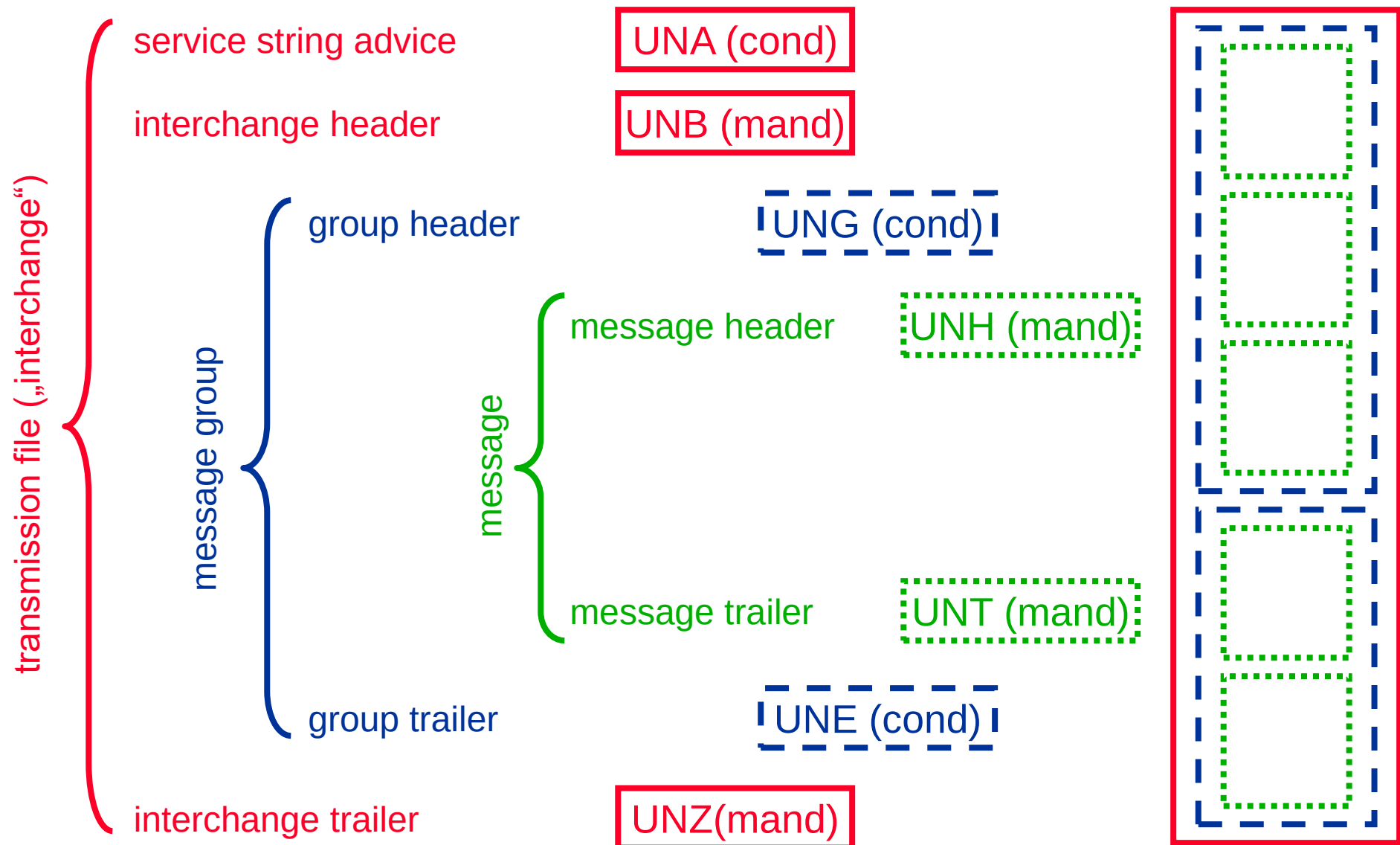
see also ISO 9735-2:2002, p. 4

Message structure



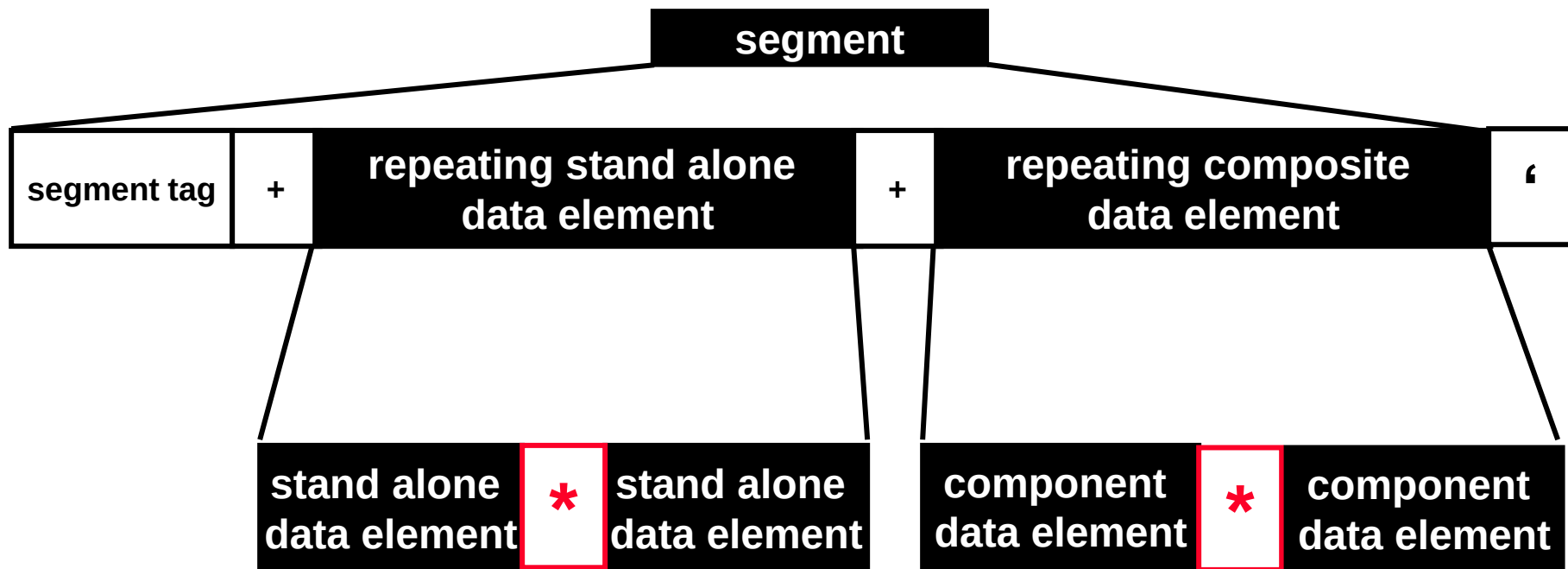
Message structure

see also ISO 9735-2:2002, p. 4



for „cond“ and „mand“ see ISO 9735-2, chapter 5

message structure



Attention!
New in ISO 9735:2002: The repetition separator !

see also ISO 9735-2:2002, p. 4

Message structure: The repetition separator

ADR ADDRESS**Function: To specify an address.**

This is two times
„060“ and NOT
„060“+„070“ !

010	C817	ADDRESS USAGE	C	1
	3299	Address purpose code	C	an..3
	3131	Address type code	C	an..3
	3475	Address status code	C	an..3
020	C090	ADDRESS DETAILS	C	1
	3477	Address format code	M	an..3
	3286	A		
	3286	A		
	3286	A		
	3286	Address component description	C	an..70
	3286	Address component description	C	an..70
030	3164	CITY NAME	C	1 an..35
040	3251	POSTAL IDENTIFICATION CODE	C	1 an..17
050	3207	COUNTRY NAME CODE	C	1 an..3

ADR+2:3:1++Bremen+28195+D+12::Huchting*12::Findorf'

060 C819 COUNTRY SUB-ENTITY DETAILS C 5

	3229	Country sub-entity name code	C	an..9
	1131	Code list identification code	C	an..17
	3055	Code list responsible agency code	C	an..3
	3228	Country sub-entity name	C	an..70

070 C517 LOCATION IDENTIFICATION C 5

	3225	Location name code	C	an..35
	1131	Code list identification code	C	an..17
	3055	Code list responsible agency code	C	an..3
	3224	Location name	C	an..256

repeating
composite
data elements

source: edsd.03a

Repetition separator (example)

„Dependency notes in the message specification are used to describe the relationship between segments, between segment groups, or between segments and segment groups.“

„D1 ONE AND ONLY ONE

One and only one of the entities in the list shall be present.

D2 ALL OR NONE

If one entity in the list is present, the rest shall be present.

D3 ONE OR MORE

At least one of the entities in the list shall be present.

D4 ONE OR NONE

No more than one entity in the list shall be present.

D5 IF FIRST, THEN ALL

If the first entity in the list is present, then all of the others shall be present. It is permissible that one or more of the entities not specified as the first entity in the list may be present, without requiring the first entity to be present.

D6 IF FIRST, THEN AT LEAST ONE MORE

If the first entity in the list is present, then at least one more shall be present. It is permissible that one or more of the entities not specified as the first entity in the list may be present, without requiring the first entity to be present.

D7 IF FIRST, THEN NONE OF THE OTHERS

If the first entity in the list is present, then none of the others shall be present.“

**Attention - new in
ISO 9735:2002:
Dependency notes !**

USY SECURITY ON REFERENCES

Function: To identify the applicable header, and to contain the security result and/or to indicate the possible cause of security rejection for the referred value.

Pos	TAG	Name	S	R	Repr.	Notes
010	0534	SECURITY REFERENCE NUMBER	M	1	an..14	
020	S508	VALIDATION RESULT	C	2		1
	0563	Validation value qualifier	M		an..3	
	0560	Validation value	C		an..1024	
030	0571	SECURITY ERROR, CODED	C	1	an..3	1

DEPENDENCY NOTES:

1. D3(020, 030) One or more



Where are the mistakes ?

UNA	UNG	UNB	message	message	UNE	message	UNE	UNZ
-----	-----	-----	---------	---------	-----	---------	-----	-----

UNG	message	UNH	segment group	segment	UNE	segment	UNT
-----	---------	-----	---------------	---------	-----	---------	-----

UNH	trigger segment	segment	segment	segment group	trigger segment	trigger segment	UNT
-----	-----------------	---------	---------	---------------	-----------------	-----------------	-----

segment tag	+	stand alone data element	+	+	component data element	+	component data element	:	:	:	stand alone data element	+	component data element
-------------	---	--------------------------	---	---	------------------------	---	------------------------	---	---	---	--------------------------	---	------------------------

message structure (exercise)



These are the mistakes !

UNA	UNG	UNB	message	message	UNE	message	UNE	UNZ
-----	-----	-----	---------	---------	-----	---------	-----	-----

UNA	UNB	UNG	message	message	UNE	UNG	message	UNE	UNZ
-----	-----	-----	---------	---------	-----	-----	---------	-----	-----

UNG	message	UNH	segment group	segment	UNE	segment	UNT
-----	---------	-----	---------------	---------	-----	---------	-----

UNG	message	UNH	segment group	segment	UNT	UNH	segment	UNT	UNE
-----	---------	-----	---------------	---------	-----	-----	---------	-----	-----

UNH	trigger segment	segment	segment	segment group	trigger segment	trigger segment	UNT
-----	-----------------	---------	---------	---------------	-----------------	-----------------	-----

UNH	trigger segment	segment	segment	segment group	trigger segment	trigger segment	UNT
-----	-----------------	---------	---------	---------------	-----------------	-----------------	-----

segment tag	+	stand alone data element	+	+	component data element	+	component data element	:	:	:	stand alone data element	+	component data element
-------------	---	--------------------------	---	---	------------------------	---	------------------------	---	---	---	--------------------------	---	------------------------

segment tag	+	stand alone data element	+	+	component data element	:	component data element	+	stand alone data element	+	component data element	,
-------------	---	--------------------------	---	---	------------------------	---	------------------------	---	--------------------------	---	------------------------	---

message structure (solution)

The End

The End