The ZUGFeRD Format

Specification and implementation rules for the cross-industry core invoice format of the Forum for Electronic Invoicing in Germany (FeRD – Forum elektronische Rechnung Deutschland)

Version 1.0

ZUGFeRD 1.0 German Specification: 25th June 2014;
ZUGFeRD 1.0 English Translation: 1st January 2015

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Title of the document	**The ZUGFeRD Format** Specification and implementation rules for the cross-industry core invoice format of the Forum for Electronic Invoicing in Germany (FeRD – Forum elektronische Rechnung Deutschland)
Date last modified	25 June 2014, Translation: 01.01.2015
Current version	Version 1.0
Status	Final version for publication

113   <u>Change history</u>

Version no.	Change date	Changed by	Summary of changes
1.0	25 June 2014	FeRD WP 3 Technical Standards and ZUGFeRD	First version of ZUGFeRD 1.0

114

115

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2 Introduction

Experts agree: electronic invoicing is here to stay. According to the very latest projections, the potential savings to be made by the business sector and administration in Germany in the event of a nationwide changeover from paper-based to electronic invoicing would run to many billions of euro each year. This is most notably the case for small and medium-sized enterprises, many of which are still not benefitting from the advantages offered by electronic invoices. Experiences in particular with small and medium-sized enterprises reveal that cost savings of between 70 and 80 percent can be achieved by sending an invoice electronically as opposed to processing it manually. According to estimates and market studies, only 18 percent of the total invoices issued in Germany each year are sent electronically.

It is therefore high time for the business sector and administration to climb aboard the electronic invoicing train and to promote its use and application in all areas of business and public administration.

2.1 Objective of the Forum for Electronic Invoicing in Germany (FeRD)

The Forum for Electronic Invoicing in Germany (FeRD) is the national platform of associations, ministries and companies aimed at promoting electronic invoicing in Germany.

The Forum's task is to focus on the topic of electronic invoices from a technical, business, economic and legal perspective as well as to prepare, coordinate and implement suitable measures for the swift and simple use of electronic invoices. It represents the interests of its members at European and international level.

The Forum was founded in Berlin on 31 March 2010 with the participation of various ministries of the federal and state governments, the Federal Chancellery (Secretariat of the National Regulatory Control Council, a government agency aimed at reducing bureaucracy) as well as the leading German business associations and other trade associations under the umbrella of the Arbeitsgemeinschaft für Wirtschaftliche Verwaltung (German Association for Economic Administration). The Forum is designed to increase both the level of acceptance and the dissemination of electronic invoices in Germany, to help shape opinion among companies and associations and to pool German opinion to pass on to European bodies such as the European Multistakeholder Forum on Electronic Invoicing.

2.2 ZUGFeRD: quicker and easier invoicing

A uniform data format that can be used both in business and in public administration is key to realising the desired cost savings.

In order for small and medium-sized enterprises to also benefit from the advantages of the e-invoice, FeRD has developed a uniform data format called ZUGFeRD, the "Central User Guide of the Forum for Electronic Invoicing in Germany" (*Zentraler User Guide des Forums elektronische Rechnung Deutschland*), which has been available to all interested companies and organisations since June 2014.

Using the new format, invoices can be exchanged electronically between different companies as well as between companies and the public administration quickly, conveniently and easily. Moreover, the new ZUGFeRD format not only reduces invoicing costs – the entirely electronic process makes material and postage costs redundant – but will also make invoicing much more efficient in future by means of optimised processes.

The first companies and authorities, including GS1 Germany, August Storck KG and the German Federal Office of Administration, are already using the new ZUGFeRD format. GS1 Germany, for instance, has been sending invoices only electronically, using the ZUGFeRD format, since 1 July 2013. The Federal Office of Administration, which processes some 50,000 invoices a year, expects the introduction of ZUGFeRD to make working procedures quicker and more efficient, to reduce the number of late payments and to reduce printing and postage costs.

2.3 International embedding of the ZUGFeRD format

The IT industry, in particular companies which develop financial management, document management and ECM software, regards a uniform format for electronic invoices as a source of considerable potential for increasing efficiency.

The fact that the new format can be used internationally is a key aspect in this regard. The ZUGFeRD data model can also be used in non-German-speaking countries – both in Europe and beyond.

ZUGFeRD is based on the regulations of the Cross Industry Invoice (CII) standard developed by the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) as well as on the European Committee for Standardisation's (CEN) Message User Guides (MUG) for a core invoice, for which the CII serves as a basis. This means that the foundation for establishing ZUGFeRD as a uniform European format has already been laid. A recommendation for precisely this pan-European approach has already been made by the European Multistakeholder Forum on Electronic Invoicing.

The direct and active involvement of the Forum for Electronic Invoicing in the European Multistakeholder Forum on Electronic Invoicing and CEN means that the interests of ZUGFeRD users are represented effectively in these bodies.

2.4 Outlook

230

231 Providing invoice data digitally has fundamental benefits for both the business sector and administration:
232 quicker and more efficient work processes, fewer late payments as well as lower printing and postage
233 costs. This in turn reduces errors and improves transparency while the procedural steps involved in pro-
234 cessing invoices are made quicker overall. Ultimately, the actual added value is in the automated pro-
235 cessing of the invoice's contents, which the ZUGFeRD format guarantees.

3 The ZUGFeRD concept

3.1 Positioning of ZUGFeRD

In addition to small and medium-sized enterprises and public administration, the target group and beneficiaries of ZUGFeRD include in particular small and micro enterprises (e.g. one-man businesses) and administrations which may be both senders as well as recipients of invoices. ZUGFeRD is designed to make matters noticeably more straightforward, most notably for those parties which only issue a small number of invoices to one partner each year or for parties which sometimes or even exclusively deal with partners with which there is no regular business relationship.

To achieve this aim, electronic invoices should be just as easy to send and receive as paper invoices. This means in particular that it must be possible to **exchange invoices without any prior consultation or agreement**. This is the key difference to sending electronic invoices using the current EDI processes.

In cases where high volumes of data are involved, the **EDI process** has become firmly established in the business world. EDI is therefore the right choice in cases where mass data is to be exchanged as part of regular business relationships. However, these are generally conditional on there being corresponding bilateral arrangements in place based on established EDI standards such as EANCOM® or Odette. Although EDI users may also have business relationships involving lower volumes of data (most commonly found in relationships between large enterprises and small or medium-sized enterprises) or have suppliers that use non-EDI-compliant cost accounting systems, EDI processes need to be supplemented if they are to replace paper-based or WebEDI-based processes. ZUGFeRD aims to fill this gap.

EDIFACT and subsets, GS1 XML, ISO 20022, etc.	ZUGFeRD
▪ Process optimised	▪ »Simply start«
▪ 100% automatised processing	▪ Support with posting to accounts
▪ As little data transfer as possible	▪ As few requirements as possible
▪ Bilateral arrangement required (national and industry profiles)	▪ No bilateral arrangement required
▪ Suitable for a regular business relationship	▪ Suitable for one-time buyers (e.g. including online shops)
▪ Processing of mass data	▪ 1 file = 1 invoice
▪ Special case in terms of VAT	▪ Invoice verification is the same as for paper invoices

Figure 1: Distinction between conventional EDI and ZUGFeRD

On the other hand, the potential in terms of the cost savings associated with sending invoices electronically can only be fully realised if the invoicee is also able to process the invoice automatically. This requires a **minimum of structured data**.

261   Although there are solutions available on the market which enable to capture the content of invoices rela-

262   tively accurately as structured data using OCR software, the required degree of efficiency can only be

263   achieved by such solutions in a closed system with a fixed supplier structure.

264   In business relationships involving regular electronic invoicing, ZUGFeRD can create significant savings

265   potential for the receiving partner, especially where automated machine processing and verification is

266   possible. This means that under normal circumstances, checks carried out on incoming invoices to ensure

267   that they include all of the required statutory and business data must be possible based solely on the in-

268   voice data, without also having to analyze the actual image of the invoice. To do this, all required infor-

269   mation must be available in structured and qualified form. In terms of ZUGFeRD implementation, this

270   means that for invoicers with customers in this field, further requirements within ZUGFeRD may need to

271   be implemented. ZUGFeRD supports various "profiles" to reflect these requirements.
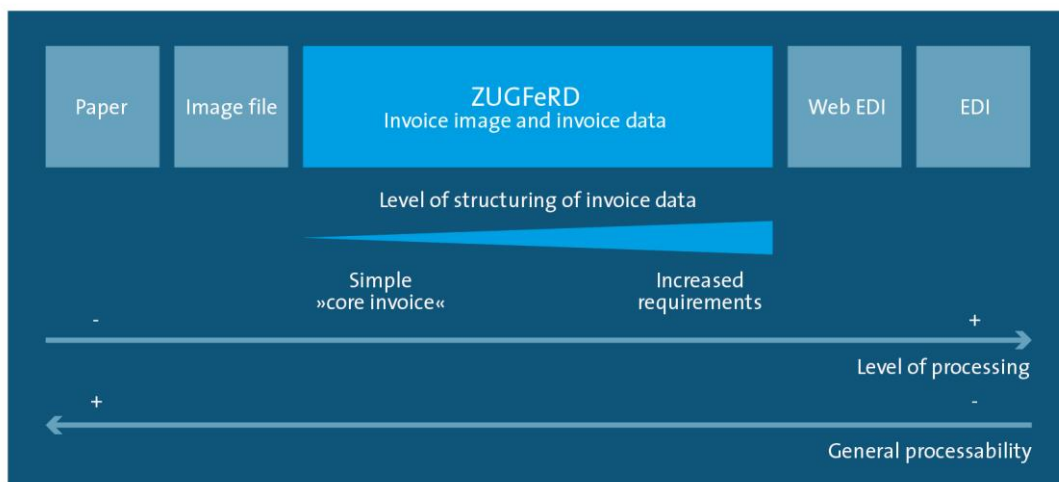
272

273   *Figure 2: ZUGFeRD closes the gap between paper and EDI*

274   The aim of ZUGFeRD is to close the gap between the simple exchange of invoices as an image file (e.g.

275   PDF) and the EDI process, which consists purely of structured data and is relatively complicated.

276   The use of structured data also enhances accessibility. This can also be supported by the use of PDF/A-3u

277   if the receiving system is not yet able to process the XML data.

278

3.2 Benefits of ZUGFeRD

3.2.1 For invoicers

Parties sending invoices can improve their outgoing invoice process simply by switching from paper-based invoicing to electronic invoicing (e.g. sending an invoice by e-mail as a PDF file):

- This saves **costs on printing, envelopes and postage** and also saves lots of time as a result of manual working procedures no longer being required.

- The electronic archiving of outgoing invoices saves paper as multiple copies of the invoices no longer need to be filed, saves space taken up by ring binders, saves time on manual filing and also makes it easier to find invoices that have already been filed.

- Furthermore, the potential to **further digitalise their business processes** (e.g. reminders) is possible to invoicers, as an electronic channel of communication to the customer is already established when the electronic invoice is introduced.

However, adding invoice data in the ZUGFeRD format to the electronic PDF invoice creates further opportunities for invoicers in their relationships with customers:

- First, by sending invoices in the ZUGFeRD format, the invoicer can enhance the level of **acceptance for electronic invoicing** among his customers: if only the invoicer himself has benefited thus far from the switch to PDF invoices, his customer will now benefit too as he will be able to process the invoices automatically.

- Second, the fact that it is easier for customers to pay a ZUGFeRD invoice can speed up the receipt of payments and thereby **improve liquidity**. In particular, the invoicer's payment demands can be reconciled with the payments credited to his account if the account statement is provided via electronic banking in a structured form by the invoicer's payment service provider.

- Electronic invoicing is already common practice in longer-term business relationships. In such instances, customers often use their negotiating position to get their suppliers to migrate to structured invoicing. If this is not possible for suppliers due to their system requirements, they still have the option of using so-called WebEDI solutions. These solutions require the user to transfer the invoice data manually to a web interface as part of a process which is not only complicated but which in some cases can vary greatly per invoicee. In such cases, ZUGFeRD, as a cross-industry invoicing format, helps in meeting the **requirements of many potential invoicees** and thereby saves on a lot of manual input. Accommodating the wish expressed by more and more customers to receive invoices in a suitable format which will allow them to process the invoices further electronically is therefore easier.

312	•	The fact that the ZUGFeRD format is designed to accommodate not only an image of the invoice
313		but also invoice data for automated processing means that the invoicer can use a single output
314		format to reach customers who process invoices either manually or in an automated fashion. This
315		reduces the workload for the invoice issuer as **he only has to use one format**.

316 However, the benefits of ZUGFeRD for the invoicer are not solely restricted to invoicing customers. The
317 ZUGFeRD invoice data format is also beneficial in terms of **processing outgoing invoices internally within**
318 **the company**:

319	•	Often, outgoing invoices are required and processed not just in one central system; very often
320		several systems within a company are used. Examples include a system for writing invoices, one
321		for archiving invoices and a third system to monitor the receipt of payments. In micro and small
322		enterprises, the posting and archiving of outgoing invoices and the provision of invoices for com-
323		pany audits is carried out on systems belonging to the tax advisor appointed by the company.

324	•	The costs of integrating these systems are often high and, for micro and small enterprises in par-
325		ticular, prohibitive. They therefore have to rely on the respective software providers equipping
326		their programme packages with the requisite interfaces. In such integration scenarios, ZUGFeRD
327		can serve as a **standardised in-house data exchange format** which facilitates further processing in
328		other systems and among other service providers. For archiving purposes, for example, the index
329		data required in the document management system could be automatically ascertained from the
330		ZUGFeRD invoice data format.

331 In summary, the invoicer gains considerable benefits from preparing invoices that are ZUGFeRD-
332 compatible.

333 3.2.2 For invoicees

334 ZUGFeRD also helps the **invoicee**:

335	•	The fully automatic, error-free filing of incoming invoices saves paper as multiple copies of the in-
336		voices no longer need to be filed, saves space taken up by ring binders, saves time on manual fil-
337		ing and also makes it easier to find invoices that have already been filed.
338	•	Forwarding invoices electronically for approval speeds up the release process, makes it easier to
339		comply with early payment discount periods and prevents documents from getting lost.
340	•	Automatic reconciliation with orders placed reduces the processing burden and saves working
341		time. The automatic transfer of data into the financial accounting and payment system prevents
342		input errors, speeds up posting and thus saves working time.
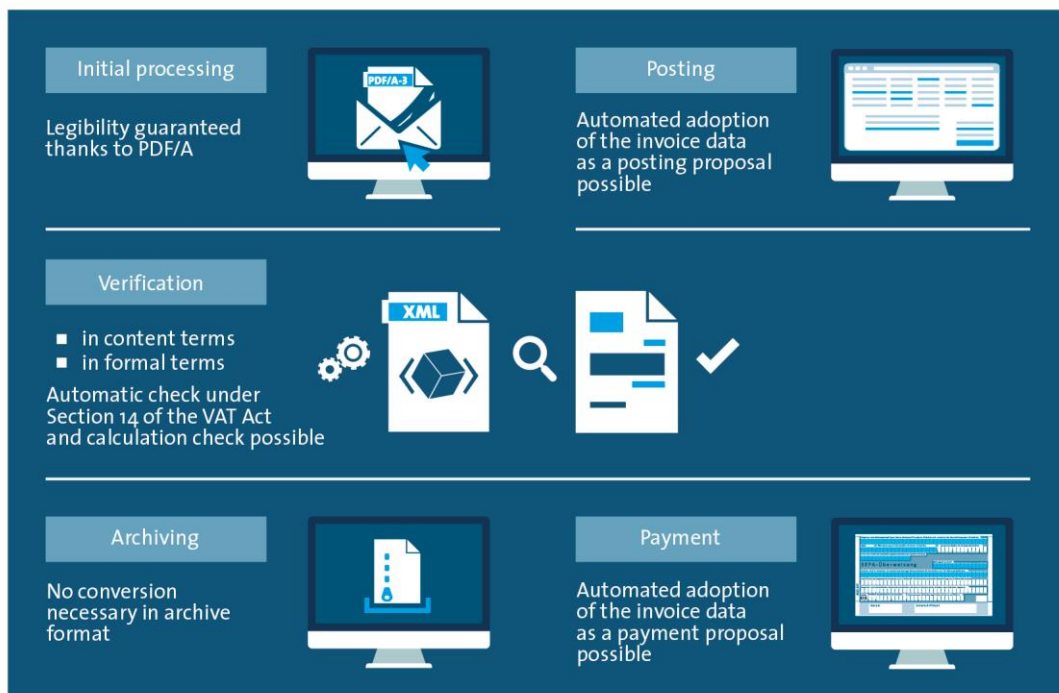
Figure 3: Tasks made easier by ZUGFeRD

3.2.3 For private customers

In many sectors, invoices issued to private customers are still sent as a paper copy by post. This is because invoices shown on company portals which are operated by the invoicers themselves have met with an adequate level of private customer acceptance only in a small number of sectors. Given that regular use by private customers requires them to log in to company portals at least once a month for a particular reason. This is not very convenient. Examples of successful company portals can be found among banks and telecommunication companies.

In those sectors where the reasons for using company portals are less frequent, the portals themselves have barely any success. As a result, invoices sent to private customers by utility firms, waste management companies and insurance companies, as well as notifications from administrative bodies and authorities, are in most cases not sent electronically.

Example: Invoices sent via e-mail and secure e-mail portals

Invoicers send their customers invoices in the ZUGFeRD format either via e-mail, or via secure e-mail solutions (e.g. De-Mail in Germany) if they want to ensure beyond dispute that the invoice is received. The invoicee's e-mail or secure e-mail provider can analyse the XML structures of the ZUGFeRD invoices and show these in its portal's overview (inbox) as an "Invoice" document. The due date and invoice amount can also be shown directly in the overview, in addition to the standard fields (date, file size, sender). In the

362   detailed view, the original copy of the invoice is shown to the customer in a PDF file. The customer can

363   archive this PDF locally or in one of the online storage solutions chosen by him.

364   Functions to support payment via transfer or other payment methods can be directly integrated into the

365   portal by the portal operator so that invoices can be paid without having to switch to a different medium.

366   The portal therefore acts as an EBPP portal. The invoice benefits thanks to there being a greater level of

367   payment discipline and a lower error rate in the reference fields. This in turn ensures not only that incom-

368   ing payments are posted entirely automatically, but also that manual assignment processes and queries

369   are avoided and incoming payments are posted sooner.

370   <u>Example: Invoices sent using electronic banking software for private customers</u>

371   Electronic banking software can be used to transfer ZUGFeRD invoices directly into payment orders. To do

372   this, upon receipt the customer saves the ZUGFeRD invoices in the electronic banking software. The XML

373   data is analysed by the banking software and used to prepare the payment. The customer can then exe-

374   cute the payment order without entering any further data and archive the ZUGFeRD-invoice in his elec-

375   tronic banking software. This method of processing invoices also benefits the invoicer, compared to pa-

376   per-based invoicing, as there is a greater degree of payment discipline and a lower error rate as switching

377   media is prevented.

378

3.3 Basic principles of the ZUGFeRD concept

ZUGFeRD requires for invoice data to be sent in structured form. The challenge here is that the requirements for processing structured data on the part of the sender and recipient of electronic invoices may vary considerably depending on the level of IT capabilities available for processing electronic invoices. At the same time, it may be necessary for the invoicer and invoicee to enter into an agreement under which the scope of the structured data can be harmonised on a bilateral basis.

The requirements placed on the sender of electronic invoices are therefore twofold:

- First, the sender of the invoice must be able to provide the requisite data from his existing systems.
- Second, the software used to prepare the invoice must be able to map this data in the electronic invoice in a structured form.

For this purpose, the ZUGFeRD concept is designed in such a way as to keep the number of mandatory data fields requiring population as low as possible, thus eliminating any further requirements placed on the invoicer as regards data storage. Additional the structured data always must represent a complete invoice, even if not all included information is given in a structured way

The following basic principles apply:

- The use of structured invoice data by the invoicee is optional.
- In order for the invoicee to be able to exercise this option, the invoicer must send his invoice data (in accordance with a defined ZUGFeRD-profile) in structured form (insofar as this is permitted by the underlying transaction).
- In each case, the structured invoice data and the invoice image must fulfil all of the invoice requirements (e.g. in terms of legislation governing VAT, other statutory provisions, requirements arising from the business process) and include all of the required information, in particular legal information.

ZUGFeRD deliberately imposes no requirements in terms of the layout of the invoice image as this is generally adopted from existing systems. As a result, the representation of the invoice contents in the invoice image and in the invoice data is not syntactically identical. Neither is this required under tax regulations since multiple copies of one and the same invoice that are identical are then assessed as such if the contents are the same in terms of German tax law. This is the reason why, for example, the invoice image does not contain any syntactic information such as codes. Instead, the invoice image often includes information which makes it easier for people to understand, such as sub-totals, line or page breaks.

3.4 Components of the ZUGFeRD standard

Three different levels are considered in order to define the standard: "Semantics", "Transmission" and "Governance".
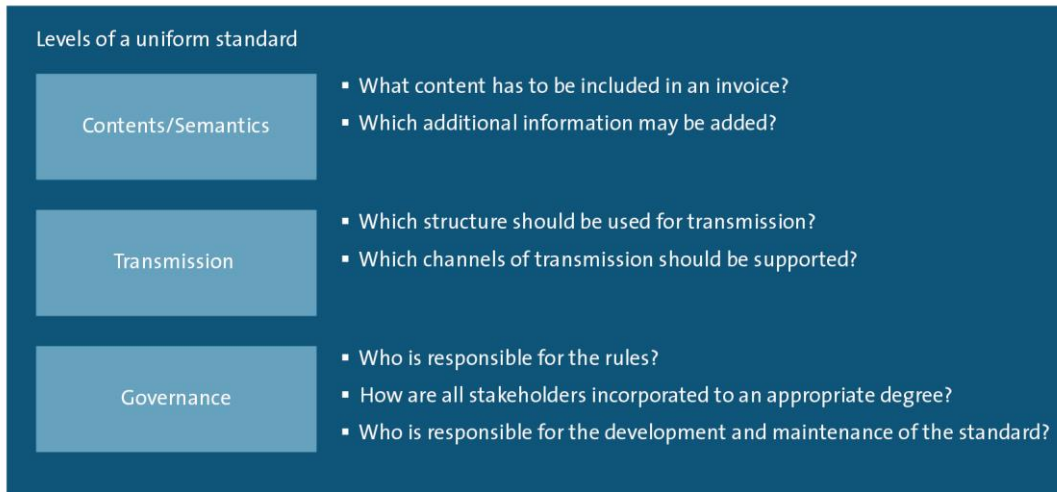
Figure 4: Levels of the ZUGFeRD standard

Semantics, i.e. the description of which contents make up an invoice, is described in the **ZUGFeRD data model**. The transfer format includes a mapping of this data model to technical structures as well as the type and manner of embedding in a PDF/A-3 container and is referred to below as the **ZUGFeRD format**. The ZUGFeRD data model and the ZUGFeRD format together form the **ZUGFeRD standard**. The regulations governing the maintenance and further development of the standard are laid down in the **ZUGFeRD governance** (see chapter 3.9). Together with the ZUGFeRD governance, the ZUGFeRD standard forms the **ZUGFeRD framework**.

The following aspects in particular have been taken into account in the ZUGFeRD design:

- The data and document format must be designed in such a way that it can be also processed further by each invoicee in the conventional manual way, without any additional effort and without the need for any special tools.
- As a result, the invoicer can use the data and document format for invoices to all customers, irrespective of whether or not the customers intend to further process the invoices electronically.
- The standardisation of the invoice data structures must be restricted to content components which are either mandatory for all invoices (e.g. due to statutory provisions) or which are used frequently, irrespective of sector or type of company, and can be used on a universal basis (usual details such as order number, payment period, etc.). Sector-specific content components concerning in particular the structures of invoice items, should be excluded due to the high complexity of the standardisation procedure. Where necessary, they can be taken into consideration as part of a subsequent addition to the standard.

436	•	Where possible, the data formats to be used should be drawn up on the basis of already existing
437		public norms or established industry standards. Any standards established in other countries
438		should also be taken into account.
439	•	In technical terms, it should be relatively easy for solution providers that generate, receive and/or
440		process invoices further to integrate the standard. In particular, there should be no requirement
441		for any technologies which are either protected or only offered by just one manufacturer.

442 <u>These aspects form the basis for the stipulations governing the implementation of ZUGFeRD:</u>

443 ***ZUGFeRD format***

444 PDF/A-3 is the format used for ZUGFeRD.

445 This format offers the following benefits:

446 • It is able to meet all the requirements made of an electronic invoice in a single file.

447 • It is able to embed all data used for automated further processing.

448 • Invoicees who do not carry out any automatic further processing are not irritated by additional
449 files.

450 • Invoices can be viewed using the free tools which come preinstalled on virtually all PCs, smart
451 phones and other end devices.

452 • PDF is already the most widely used data format for exchanging documents.

453 • PDF/A ensures that an invoice file can be viewed permanently in a form that remains identical.

454 Data used for the purposes of automatic further processing by the invoicee is embedded as an XML file in
455 the PDF file, in accordance with the PDF/A-3 specification. This method has the following benefits:

456 • XML is established as the data format, and tools to create and extract XML are allready available.

457 • An XML specification allows for flexible extension, without jeopardising backward compatibility.

458 • The embedding of XML datasets in a PDF in accordance with the PDF/A-3 specification corre-
459 sponds to the standard that is already commonly applied.

460 For convenience the following rule applies: **1 PDF/A-3 file = 1 invoice.**

461 Where an invoice is in the ZUGFeRD format, the PDF representation (invoice image) of the invoice corre-
462 sponds to the XML file together with the structured invoice data it includes. Moreover, there is the option
463 to embed further attachments (e.g. documents substantiating the invoice).

464

465   *ZUGFeRD data model*

466   The data to be embedded in the PDF as an XML dataset are to be derived from already established nation-
467   al and international standards and norms. The Core Component Specification (ISO 15000-5:2014), and the
468   UN/CEFACT Cross Industry Invoice (CII) Standard at profile level, serve as international guiding standards.
469   At European level, the Core Invoice Data Model MUG has been derived as a subset of these standards. In
470   documents CWA 16356-1, -2 and -3, it describes the setup, content and data structures of a minimum
471   scope that is to apply to the sending of invoice data. The Core Invoice Data Model defined around 100
472   field types for describing an invoice. It therefore meets the core requirement of ZUGFeRD in terms of be-
473   ing a data model that is both easy to understand and straightforward to implement.

474   *ZUGFeRD transmission channels*

475   FeRD does not stipulate any requirements regarding the transmission of ZUGFeRD invoices. In the simplest
476   case, the PDF file and the integrated XML file can be sent via e-mail. However, other transmission chan-
477   nels such as portal solutions, De-Mail, FTP, etc. can be used to send invoices to their recipients.

478   The channel chosen by business partners depends on the requirements in terms of cost, acceptance, secu-
479   rity and confidentiality. Legal requirements (e.g. data protection in the case of doctors' invoices) may also
480   play a role here.

481   In public administration, incoming invoices can generally be received by e-mail, although here too, legal
482   requirements or safety and confidentiality requirements (e.g. in matters relating to security, such as pro-
483   curement for security services) may influence the decision as to which channel of transmission should be
484   chosen.

485   For outgoing invoices in the field of public administration, the same aforementioned requirements as in
486   the private sector apply.

487   For outgoing notifications (e.g. land tax assessment notices), the corresponding statutory provisions (e.g.
488   regulations in the German Fiscal Code) for transmission in an electronic format must be considered.

489

490   ## 3.5   ZUGFeRD profiles

491   As a general rule, all of the information carried in the visual representation (invoice image) of the elec-

492   tronic invoice is also provided in the structured invoice data.

493   However, to prevent software manufacturers from having to support data requirements which are only

494   needed for implementing more complex invoicing scenarios and therefore enable as many participants as

495   possible to take part in structured electronic invoicing without bilateral arrangements, a focus on the cen-

496   tral, cross-industry requirements for the transmission of a legally valid invoice ("core invoice") is neces-

497   sary.

498   As a result, a large number of invoicers are able to send ZUGFeRD-compatible invoices. Furthermore, each

499   invoicee can be sure that this data is definitely available in structured form. In larger companies in particu-

500   lar – where requirements in terms of the degree of automation are typically more extensive – the neces-

501   sary invoice information is already available in the systems as a result of upstream processes (orders, in-

502   coming goods, maintenance of master data, etc.). Consequently, there is often adequate reference infor-

503   mation (e.g. order numbers) during invoicing and it no longer has to be accommodated on the invoice in a

504   redundant manner and in a complex level of detail.

505   Further cross-industry requirements are to be reflected by extended profiles which not only allow for

506   more extensive automation but are also more demanding with regard to the implementing software. It is

507   assumed that over time, more and more software manufacturers will also be able to map more complex

508   issues in a structured form in the ZUGFeRD format.

509   ZUGFeRD defines three profiles.
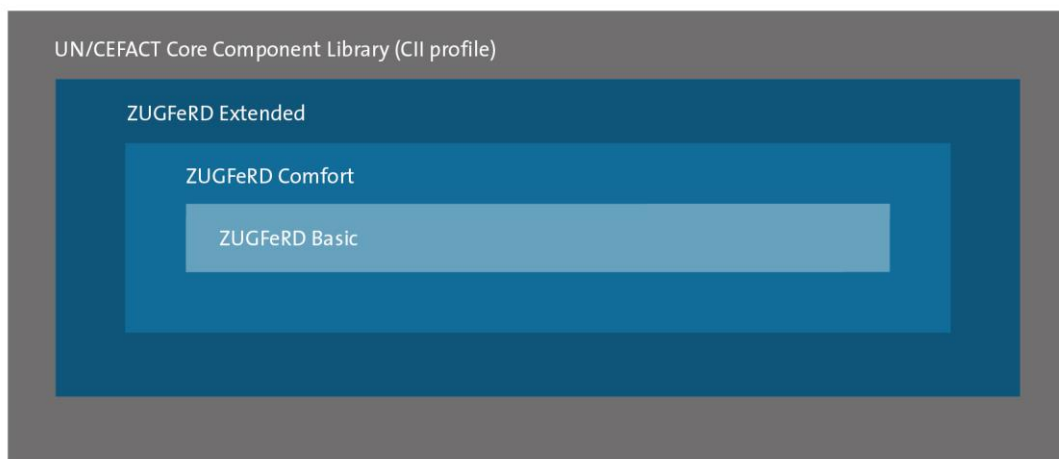
510

511   *Figure 5: Semantic profile of the ZUGFeRD standard*

512

513	The three ZUG FeRD profiles differ not only in the amount of information they support, but also in the way
514	in which this information is displayed in the structured data. There are basically three ways in which this is
515	done:

- 516 • The information is displayed in a **data field** specified for this purpose, which gives the precise cod-
- 517 ing of the information.

- 518 • The information is displayed in a **free text field**, with no further coding required.

- 519 • The information is displayed in a **qualified free text field**, which imposes no requirements in
- 520 terms of the coding of the information itself, but which places in front of the information a coded
- 521 text qualifying the content of the information (Tagging).

522 *COMFORT*

523	In the Comfort profile, any structured data which enables the invoicee to process a majority of invoices
524	sent in an automated and system-supported manner, can be sent. The Comfort profile provides particular
525	support for the processes of posting, payment and checking of invoices. The information required to do
526	this is sent either in structured form or as qualified text.

527 *BASIC*

528	The Basic profile reduces the requirements for sending structured data so that even invoices with the
529	simplest structure can be displayed. For instance, in the Basic profile, no item numbers or individual prices
530	must be sent in structured form. The data required for posting and for initiating payment are available in
531	structured form. This is essentially data in the header and footer as well as a reduced level of item data. It
532	is sufficient to display any additional information that is required in the form of free text. ZUGFeRD Basic is
533	sufficient for automatic electronic archiving as well as for most automated workflow management appli-
534	cations. However, automated invoice verification is not always possible; depending on the transaction, not
535	all of the required information is sent in a way that is machine-readable.

536 *EXTENDED*

537	The Extended profile displays all of the date shown in the ZUGFeRD data model either in structured form
538	or as a qualified text field. The respective business process determines which of the data fields actually
539	used are chosen. The Extended profile therefore covers the cross-industry requirements in terms of ex-
540	changing structured invoice data as fully as possible. Data which is not relevant, but which is usual for
541	automated invoice processing, can be sent as free text (e.g. note on an advertising campaign).
542	

543

> *Example of qualified text fields in use*
>
> A retroactive discount (payment reduction) was agreed as part of a regular business relationship. In such instances, a note on the invoice is required stating that a payment reduction can be carried out retroactively. This circumstance can be displayed in the various profiles as follows:
>
> In the <u>Basic profile</u>, the note is sent, like in the paper invoice, as unqualified free text. The receiving system then displays the free text contained in the invoice to the user. Following manual release, the invoice that has been read in can be released for posting and processing.
>
> In the <u>Comfort profile</u>, the same notice is also qualified by a code. The receiving system is therefore able to automatically recognise that the invoice includes a note regarding the payment, and can release the invoice for posting without any manual intervention.

Example 1: Qualified text fields in use

A further example (item discounts), with a comparison of the three profiles, can be found in chapter 0.

3.6 ZUGFeRD compliance

A statement on the **ZUGFeRD compliance** of the software used must always refer to one of the three profiles. A manufacturer itself should not decide which combination of data fields is supported by its software. Instead, a ZUGFeRD-compliant software package must always support one of the three profiles.

At the application process level, the <u>user</u> can decide which profile he wants to use to send an invoice. If his software supports only the Basic profile, then only the information supported in the Basic profile as structured fields needs to be sent in a structured fashion. All other information is then sent in free text fields.

If the user employs software which supports the Comfort profile, then the Comfort level may be indicated in the transmitted message if all of the information which can be mapped in the Comfort profile in a structured form is actually sent in a structured form.

If the user employs software which supports the Comfort profile, yet sends the information in a free text field even though this information should be sent in a structured form based on the Comfort-profile, only the Basic level may be indicated in this invoice.

Even if some information is reproduced in a structured form in accordance with the Comfort level, while other information continues to be sent as free text, then the level indicated for this invoice must be "Basic". The Comfort level may only be indicated if all of the information which can be reproduced in the Comfort level in structured form is also sent in structured form. This does not mean that all of the data field supported in the Comfort level have to be used, but only that if information is transmitted, that it must be done in structured form.

Examples distinguishing between the profiles can be found in chapters 5.4.2 and 5.6.1 and elsewhere.

3.7 Industry-specific extensions

If the data to be transmitted is subject to additional requirements in certain industries, there are two different ways in which these requirements can be met.

First, the industry-specific information can always be in the form of free text.

Second, for optimised invoice processing in a particular industry, further data may need to be transmitted in structured form. In this case, the industry-specific requirements may be added to the ZUGFeRD profiles. To do this, the structures of the UN/CEFACT Cross Industry Invoice as well as the rules of derivation used within the context of ZUGFeRD to generate syntax must be used.

It should be noted that such industry-specific extensions may no longer be processed without prior (bilateral or multilateral) arrangement. Invoices to which such additions have been made must display at least the Basic profile so that companies that are not part of the particular industry are able to process the data. However, due to technical restrictions, validation against the ZUGFeRD schema is no longer possible then. Planned industry-specific additions should therefore be harmonised with the Forum for Electronic Invoicing in Germany (FeRD).

3.8 Application of ZUGFeRD

As an invoicer

Invoicers that use standard software (ERP etc.) to create invoices should first check whether their own software already supports the ZUGFeRD standard. If this is not (yet) the case, an additional program may be used. The same applies to users who create invoices in Word or Excel. Invoicers creating invoices using software which they have programmed themselves can either easily add the ZUGFeRD functions or have them added to the software. This is a straightforward process thanks to powerful tools which are easy to integrate. Free tools and open source solutions which make it easy to send ZUGFeRD invoices, especially for micro and small enterprises, are already available on the market.

As an invoicee

Invoicees that already archive invoices electronically or process them by means of digital workflow should check the degree to which the software they are using supports ZUGFeRD in order to automate the filing and forwarding of invoices. Invoicees whose invoices are posted for them by an external service provider (tax advisor, bookkeeper) should ask the service provider whether and how ZUGFeRD invoices can be sent electronically and what the benefits may be for them as a customer. Invoicees posting invoices themselves should check what functions are used by the ERP or financial accounting solution to support ZUGFeRD, i.e. what options are available for automating the invoice verification and posting process. The same applies to the payment of invoices. Here too, the invoicee should check the extent to which the electronic banking program supports the automatic transmission of payment data using ZUGFeRD invoices.

| 610 | *As a software manufacturer* |

611	Billing software programs can integrate functions used to create invoices in PDF/A-3 format and embed
612	invoice data in a ZUGFeRD-compliant manner. Powerful tools are available on the market to carry out this
613	task and make it straightforward. Depending on the focus of the industry, the software manufacturer
614	should check which ZUGFeRD level is to be supported. If it is not possible to adapt the software in the
615	short term, due to resource reasons, additional programs integrated in the printing process can be includ-
616	ed in the manufacturer's own offering. Configuration templates, that can be pre-built if necessary, make
617	working with the software easier for users, compared to having to purchase such additional programs
618	themselves. Tools which make it very easy to extract data from a ZUGFeRD invoice are also available for
619	financial bookkeeping and ECM/DMS providers. Each provider should initially consider at which point
620	ZUGFeRD invoices should be integrated into the solution and how the extracted data can facilitate further
621	processing by the user.

| 622 | |

3.9   Updates and further development (governance)

| 623 | |

| 624 | Sustainable ZUGFeRD governance is designed to ensure the following objectives: |

625	• Further development and updating of the data model and format in the longer term
626	• Reliability and stability of the data model and format
627	• Conditions of use which are both clear and free to use

628	In addition, implementation support is to be provided to software companies and users since it is possible
629	to harmonise changes to data model and format together with all interested market participants. In order
630	to do this, updates should be organised in a clear and straightforward fashion, and an adequate level of
631	service should be provided.

632 To this end, the following criteria which should be met by ZUGFeRD governance have been laid down:

633 • Decisions must be transparent and open

634 • Anti-trust regulations must be taken into consideration: individual market participants must not
635 be favoured or disadvantaged

636 • Organisations and their employees must be protected against third-party liability claims

637 • The intellectual property rights of participating organisations and their employees must be dis-
638 closed (IPR Policy)

639 • Opportunity to influence European and international standardisation activities

640 • Free publication of the ZUGFeRD specification

641 • Future work must be financially feasible

642 • Time required for implementation

643 • Industry independence

644 • Technical service provision (e.g. validation platform and support)

645 With regard to the European standardisation mandate for the creation of a uniform data model for elec-
646 tronic invoicing, ZUGFeRD also needs to be introduced accordingly into European standardisation, while
647 an ability to respond accordingly to changes is also required. FeRD therefore cooperates with the organi-
648 sations involved in these tasks, as shown in the summary below.
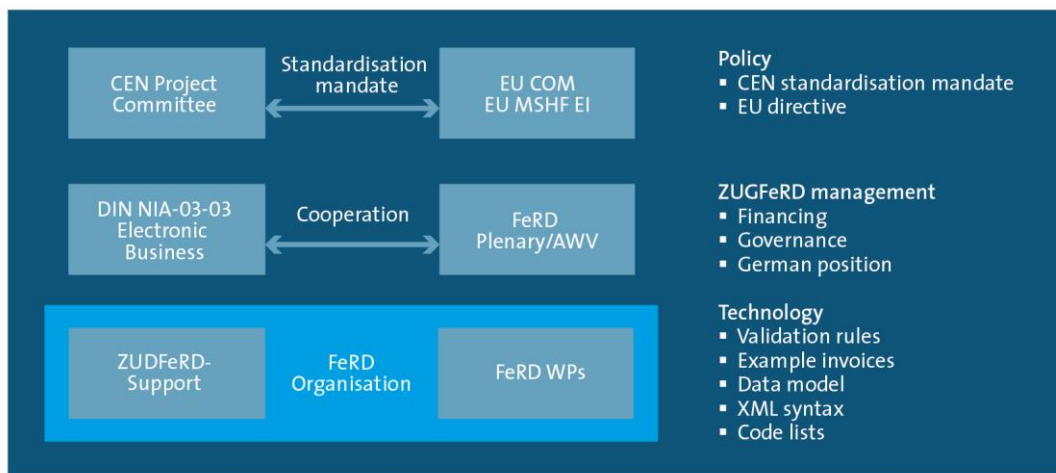
649

650 *Figure 6: ZUGFeRD governance*

651

4   Tax law aspects of ZUGFeRD

652

653 Following the amendment of Section 14 (1) and (3) of the German Value Added Tax Act (*Umsatzsteuerge-*
654 *setz - UStG*) by Section 5 (1) of the Tax Simplification Act (*Steuervereinfachungsgesetz*) 2011 of 1 Novem-
655 ber 2011 (Federal Law Gazette Part I p. 2131), the regulations for electronic invoices under value added
656 tax law were revised on 1 July 2011. Implementation guidance and help interpreting the regulations can
657 be found in the circular issued by the Federal Ministry of Finance on 2 July 2012[1].

4.1   Requirements of the Tax Simplification Act 2011

658

659 Pursuant to Section 14 (1) of the Value Added Tax Act, the authenticity of the origin, the integrity of the
660 content and legibility of the invoice must be ensured, both for paper-based and electronic invoices. This
661 can be achieved by using any internal control procedures which are capable of establishing a reliable veri-
662 fication path between invoice and supplied goods or services. The aim of the internal control procedure is
663 simply to ensure that invoices are sent correctly. An invoice whose contents are correct (a material check
664 is understood to include checks for the correct goods or services supplied, the correct supplying enter-
665 prise, correct payment, correct payee) justifies the assumption that no errors compromising the authen-
666 ticity of origin or the integrity of the content and cleared during have occurred in the course of transmis-
667 sion, i.e. that the invoice was not forged or falsified or changed in any other way; the invoice corresponds
668 to the good or service provided.[2]

669 Under the legislation, invoices sent electronically, e.g. by e-mail with an attached image file or text docu-
670 ment, provide an entitlement to the deduction of input tax provided an internal control procedure is ca-
671 pable of establishing a reliable verification path between invoice and supplied goods or services.

672

---

[1] http://www.bundesfinanzministerium.de – Federal Ministry of Finance circular of 2 July 2012, document no.
2012/0449475

[2] Federal Ministry of Finance circular of 2 July 2012, p. 2

673 The situation is summarised in the diagram below.
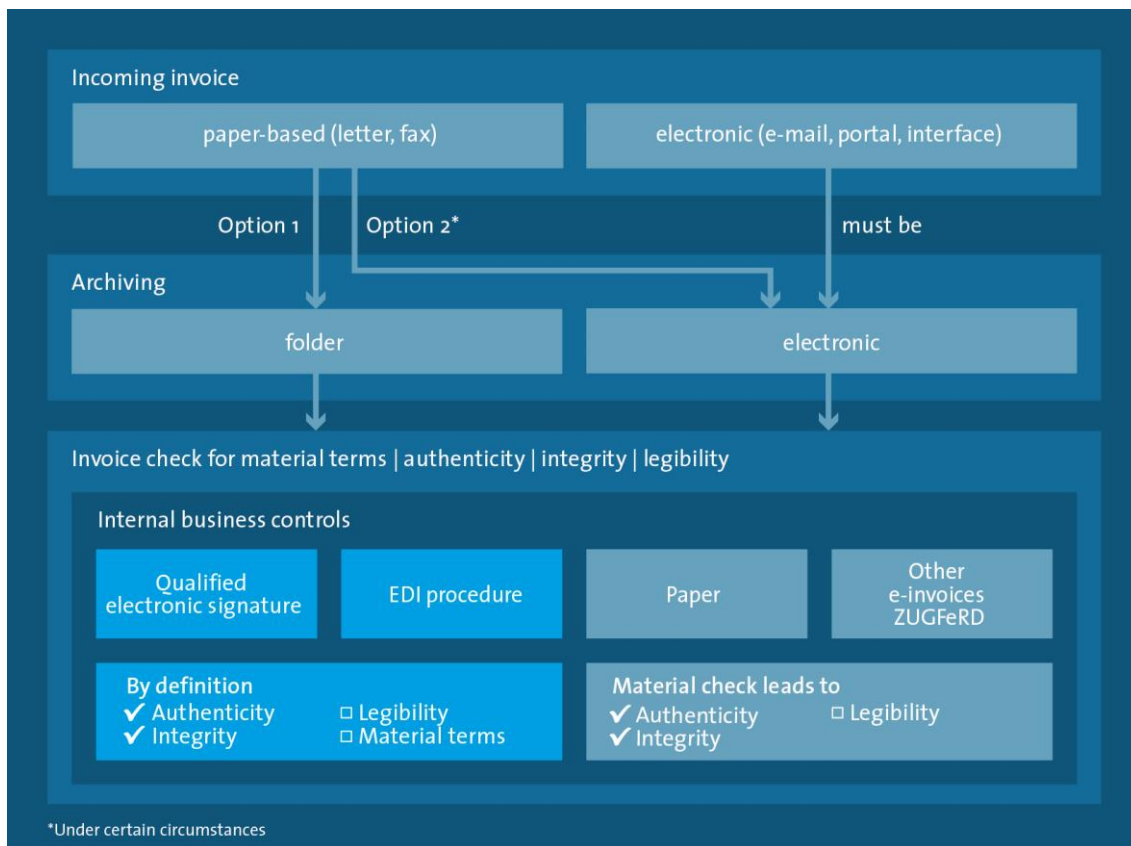
674

675 *Figure 7: The internal control procedure*

676 The electronic invoice based on the ZUGFeRD format includes both the invoice data (XML data) as well as
677 the image of the invoice (PDF/A-3). Both the data and the image can – taken in isolation – represent an
678 invoice providing an entitlement to the deduction of input tax pursuant to Section 14 (4) of the Value
679 Added Tax Act. These are identical copies of the same invoice with identical contents, integrated in a PDF
680 as a transport container.

681 Where several invoices are issued for one and the same supply of goods or services and these respective
682 invoices are not marked as duplicates or copies, the enterprise is liable to pay the tax amount shown in
683 the invoices pursuant to Section 14c (1) UStG. However, this does not apply when several copies of the
684 same invoice with identical contents[3] are sent.[4] Under the internal control procedure selected by the cus-
685 tomer – which in practice should be treated as far as possible as being equivalent to the conventional
686 verification of incoming invoices – the customer must decide whether to consider the invoice data (XML
687 data) or the invoice image (PDF/A-3) in his chosen internal control procedure. The invoicee is not obliged
688 to compare them.

---

[3] Based on the requirements of article 14 paragrah 4 of the VAT Act

[4] Federal Ministry of Finance circular of 2 July 2012, p. 4

| 689 | With regard to ZUGFeRD invoices, the invoicer must ensure that the PDF (invoice image) and XML (invoice |
| 690 | data) are identical copies of the same invoice with regards to the Value Added Tax Act. |

691 A distinction can be drawn between three alternative procedures which, for logical reasons, are used de-
692 pending on the capabilities of an organisation (IT expertise and equipment, volume of invoices received,
693 etc.):

694 • Internal control procedure based on the invoice image

695 • Internal control procedure based on the invoice data

696 • Internal control procedure based on the invoice image and invoice data (mixed variant)

697 4.1.1 Internal control procedure based on the invoice image

698 In micro and small enterprises, the internal control procedure is generally carried out based on the invoice
699 image. The enterprise will often not recognise at all that the PDF it has received also contains a data file as
700 an attachment to the PDF. The tax advisor appointed by the enterprise may also use the invoice as the
701 basis for posting business transactions in his accounting system.

702 Both micro and small enterprises benefit from the new invoicing standard if the standard software they
703 use is able to use the invoice data for entry fields and therefore save themselves the time-consuming
704 manual transfer of the relevant data for their processes. Nevertheless, a check must be carried out to see
705 whether the figures correspond to those on the invoice image.

706 For long-term business relationships involving regular recurring transactions in particular, once accuracy
707 has been established, it can then be guaranteed by means of random follow-up checks. In this context, the
708 attached invoice data record serves as a possible aid to data acquisition – in a similar way to OCR recogni-
709 tion[5] – but is of no significance in its own right with regard to the accounting record.

710 In this scenario, differences between the invoice image and invoice data are only relevant insofar as they
711 relate to the invoice data transferred into the software (so not all of the fields displayed in the invoice)
712 and are part of the internal control procedure.

713

---

[5] OCR (Optical Character Recognition) is often used together with text analysis software to extract the relevant data from
invoice images so that it can then be used for business application systems. Given that structured access to data is not
possible in the case of images, these procedures are unable to provide complete accuracy. We understand the term
"structured access" to mean access which uses a unique identifier (e.g. "invoice date") to provide a unique value. If nei-
ther the key terms – in the sense of a taxonomy – nor the technical syntax (e.g. lengths of fields) are defined, there is
only a certain likelihood that the relevant invoice data will be extracted correctly from the PDF document. The ZUGFeRD
date format specifies both the taxonomy and the syntax.

4.1.2   Internal control procedure based on the invoice data

In long-term business relationships involving regular electronic invoicing, significant savings potential can only be realised if automated processing is possible. This means that both the verification of the invoice and the documenting of the transaction for the purposes of financial accounting (which forms the basis for claiming the deduction of input tax) are carried out based on the invoice data.

Accordingly, when adopting such a procedure, the transmitted invoice data serves as the relevant basis for the deduction of input tax. In such a scenario, the invoice image should be interpreted as an anticipated or additional legible version of the invoice's contents (convenience function).

This is to be understood as being analogous to the procedure involving the simply structured electronic exchange of invoice <u>data</u> (EDI) which is already commonplace today. In electronic invoice data exchange, legibility is typically achieved using relevant programs (viewers or converters). These programs may also be prone to error. However, an error in these programmes does not mean that the invoice data visualised using these programs, is necessarily incorrect.

The invoicee is responsible for ensuring that the invoice is legible. He can do this by adopting technical/organisational steps (such as a suitable "viewer") to ensure that the invoice image matches the invoice data or by ensuring in another way that the invoice data is legible.

4.1.3   Internal control procedure on the basis of the invoice image and the invoice data (mixed variant)

Compliance with sound accounting practice requires particular scrutiny in the case of "mixed variants" (e.g. where the internal control procedure is carried out on the basis of the invoice image, while posting of the invoice in the accounts or payment thereof is performed on the basis of the invoice data). Incorrect implementation by the invoicee may theoretically mean that different data is used for auditing and for posting in the accounts.

Similar problems already currently exist in practice and can give an indication as to the structure of these organisational measures:

- Example 1 "Analogue world": At present it is still customary for a pre-completed remittance slip to be sent enclosed with a paper-based invoice. In such cases, there may be differences between the invoice amount printed on the invoice and the transfer amount printed on the remittance slip.

- Example 2 "EDI procedure": Up until the end of 2008[6], collective invoices had to be created for the EDI procedure. In theory, there could be differences between the invoice records sent electronically and the collective invoice.

---

6 The legislation aimed at modernising and reducing the bureaucracy of the tax procedure (Tax Bureaucracy Reduction Act), which entered into force on 25 December 2008, means that the former requirement for a summary invoice (collective invoice) in either paper or electronic form is no longer applicable. Under current legislation, collective invoices in the EDI procedure must be marked as a copy or supplementary document. Otherwise such invoices are subject to a value added tax pursuant to Section 14c (2) UStG as they are not identical copies of invoices with identical contents.

745   •   Example 3 "Export of posting batches": Many inventory control systems allow the user to export
746   invoice data as a posting batch. The posting file generated from the invoice data records is read
747   into the accounting programme and the entries are generated. These in turn form the basis for
748   the advance value added tax return and the deduction of input tax. Differences could arise in this
749   respect too, as a result of program errors.

750 A typical procedure here is as follows: The SME validates the invoice on the basis of the invoice image,
751 pays the invoice based on the payment data transmitted in XML and also posts the invoice in the accounts
752 on the basis of the XML data.

753 In this case, it is recommended to use organisational measures (e.g. samples) to ensure that there are no
754 differences between the invoice image and the invoice data used in the business processes.

755 First, the invoice must be checked to ensure that it is factually correct and is justified (based on the supply
756 of a good or service). Given that, in the example, this check takes place based on the invoice image, the
757 latter serves as the accounting record.

758 The XML data are used to carry over the invoice data into the payment. In this case, the invoicee would
759 notice differences between the invoice amount and the payment amount or – following a check against
760 master data as part of the internal control procedure – would see that a different bank account was used
761 before. A more extensive comparison of the invoice data is not required.

762 The XML data are also used to transfer the invoice data into the accounting system. Here the enterprise is
763 obliged to check whether the data posted during the accounting process matches the data from the corre-
764 sponding invoice. This applies irrespective of the type of invoice (and is not therefore a particular re-
765 quirement of a ZUGFeRD invoice). Where accounting is carried out by a tax advisor, the supervisory duty
766 shall also be transferred to the tax advisor.

767 The following points are key to the risk assessment from the perspective of the invoicee:

768   •   Based on the case law of the Federal Court of Finance (*Bundesfinanzhof*), the right to the deduc-
769   tion of input tax does not require the posted record in the accounts to be checked against the in-
770   voice;

771   •   Incorrect posting of records in the accounts, which cannot be ruled out in spite of adequate (sam-
772   ple) checks, must be subsequently corrected (for each invoice format);

773   •   Responsibility for a proper and correct invoice lies with the invoicer, not the invoicee.

774 A ZUGFeRD invoice imposes no new requirements. It merely provides grounds for verifying whether the
775 controls maintained in the past were sufficient or whether they existed at all. As an organisational meas-
776 ure, it is recommended – especially in the case of new business relationships – to carry out a sample in-
777 spection of the invoice data shown in the image with the posting data adopted in the accounting system.
778 Any further comparison of the invoice data is not required.

4.2 External audit (company audit) perspective

The new invoice standard makes company auditing easier since a special viewer does not have to be installed to carry out an inspection of the invoice image as well as an automated data analysis based on the invoice data.

Nevertheless, arbitrariness in the interpretation as to whether the invoice image or the invoice data serves as the accounting record, cannot be excluded. For pragmatic reasons, it should therefore be assumed that auditing and the posting of invoices to the accounts are based on the invoice image for micro and small enterprises, unless otherwise agreed.

4.3 Archiving and visualisation in the case of ZUGFeRD

The following chapter describes the situation in Germany at the date of June 2014.

Enterprises are obliged to store business records for a period of between six and ten years. If the documents are to be stored electronically, the archive system used must manage the information in a "revision-proof" manner, i.e. in a proper and correct way that keeps the information secure, unchanged, complete, and which enables it to be reproduced. In this regard, an electronic archive must fully comply with the requirements of the German Commercial Code (*Handelsgesetzbuch – HGB*) (articles 239, 257), the Fiscal Code of Germany (*Abgabenordnung – AO*) (articles 146, 147), the Generally Accepted Principles of Computer-assisted Accounting Systems *(Grundsätze ordnungsgemäßer DV-gestützter Buchführungssysteme – GoBS)* and the General Principles regarding Data Access and the Verifiability of Digital Records (*Grundsätze zum Datenzugriff und zur Prüfbarkeit digitaler Unterlagen – GDPdU*) in technical and functional terms.

Incoming documents are generally recorded and archived in accordance with the "early archiving" or late archiving" strategies. In early archiving, incoming documents are recorded centrally (typically in the inbox), and classified and archived by document type. The records are then forwarded electronically to the responsible officials. In late archiving, the incoming document is posted in the specialist department using the paper-based copy. The documents are then recorded and archived in a central registry.

Using ZUGFeRD simplifies a number of the steps in the archiving process:

- First, the "Scan" operation is no longer required as the documents are sent electronically. The documents can then be fed directly into the processing system.
- The recording process can also be restructured. For paper documents, metadata were extracted with the aid of OCR procedures. For documents sent electronically, special format-dependent procedures were used to extract metadata. ZUGFeRD greatly simplifies the extraction of metadata: the ZUGFeRD XML structure embedded in the PDF/A format contains all metadata and can be processed electronically. The data is complete and error-free, which was not the case with OCR procedures, where a manual correction was required in many cases.

813 The early archiving procedure is recommended for the archiving of ZUGFeRD documents. Documents are

814 recorded in the archive system at the earliest opportunity, whereby metadata are extracted immediately

815 and used for indexing. The presence of complete metadata at the time of recording means that docu-

816 ments can be researched by all document characteristics where the corresponding archive configuration is

817 in place. This improves archive quality; in the early archiving of paper-based documents, it was typically

818 the case that only one document reference number could be kept in the archive.

819 If the invoice image serves the accounting function, the requirements pertaining to visualisation are also

820 hereby satisfied.

821 Where the internal control procedure is carried out on the basis of the invoice data, the visualisation of

822 the XML data record using the PDF provided will in many cases be sufficient since no errors should occur

823 under normal circumstances (both are generated from the same source at the invoicer). However, this

824 does not replace the visualisation of the XML file during auditing, in the event of any uncertainty. In these

825 cases, the XML style sheet provided by FeRD may be used.

826 ## 4.4   Summary

827 In summary, taking into account the aspects relating to sound and proper invoicing as set out above, the

828 ZUGFeRD standard meets the requirements and individual objectives of all stakeholders.

829 The benefits of sending invoices electronically will become apparent to micro and small enterprises grad-

830 ually since they will initially be able to continue performing the established processes based on the invoice

831 image. Enterprises with more mature IT skills are now able to introduce automated invoice processing into

832 their relationship with micro and small enterprises. Auditing is also easier since a special viewer does not

833 have to be installed to carry out an inspection of invoices as well as an automated data analysis, based on

834 the invoice data.

5   Technical requirements and semantics

This chapter serves to analyse the processes involved in electronic invoicing and to define the data content required in order for these processes to be automated in a structured form. It also presents and explains various examples and rules for implementation.

The invoice receipt process typically comprises six main sub-processes:

- Check under Section 14 of the Value Added Tax Act
- Mathematical check
- Content check
- Payment
- Accounting entry
- Archiving

The requirements that the ZUGFeRD data model has to fulfil are determined based on these sub-processes.

5.1   Defined invoice types

ZUGFeRD supports the following invoice types:

ZUGFeRD Basic

- Commercial invoices (invoices for goods and services) with code 380
- Notifications (e.g. demands for payment of taxes by pubic authorities) with code 380
- Commercial credit notes (e.g. corrected invoices/cancellations) with a negative value (code 380)

ZUGFeRD Comfort also supports:

- Debit note related to financial adjustments (code 84)
- Credit note related to financial adjustments with a negative value (code 84)

ZUGFeRD Extended also supports:

- Self-billed invoices (credit note/self-billing procedure under tax law, code 389)
- Self-billed credit notes with a negative value (code 389)

```
Example:

<rsm:HeaderExchangedDocument>
      <ram:Name>GOODS INVOICE</ram:Name>
      <ram:TypeCode>380</ram:TypeCode>
</rsm:HeaderExchangedDocument>
```

860 *Example 2: Identification as an invoice*

861 In addition to "regular" invoices also credit notes (Correction/Cancellation) and self-billed invoices are

862 supported.

863 In the case of settlement using the self-billing procedure, bilateral arrangements are required in each case

864 in order to determine whether the recipient system is able to process this kind of credit note (self-billed

865 invoices).

866 In addition, some companies employ **different types of invoices** (e.g. goods invoices, bills of costs or re-

867 pair invoices) when receiving invoices for different process workflows and process them separately. For

868 these companies, therefore, this information is essential to efficient processing. This information can be

869 displayed in ZUGFeRD in the "Business Process, Value" field in the Extended profile. The precise formula-

870 tion may have to be agreed with the recipient.

871

872 ```
      Example:
873
874   <ram:BusinessProcessSpecifiedDocumentContextParameter>
875   <ram:ID>Repair invoice</ram:ID>
876   </ram:BusinessProcessSpecifiedDocumentContextParameter>
877 ```

878 *Example 3: Entering a special invoice type*

879 The two scenarios mentioned above are not explained in any more detail in this chapter as the focus is on

880 the core process of "standard" invoicing. Nevertheless, the ZUGFeRD data model is capable of implement-

881 ing both types.

882

5.2 General rules and conventions

883

884 The rules governing the implementation of ZUGFeRD are based on the CEN Workshop Agreement "MUG
885 CWA 16356" for a European core invoice (hereinafter abbreviated to "MUG"), which in some cases has
886 been modified for ZUGFeRD. Reference is made in each of the individual points to the corresponding rule
887 from MUG. FeRD's aim is to incorporate these modifications/additions as part of CEN's standardisation
888 process in order to guarantee uniform implementation at European level.

889 The general rules applicable to the core invoice as a whole and to its use in business dealings are as fol-
890 lows:

891 • An electronic core invoice – identified as a commercial invoice (type code 380) – represents a le-
892 gal claim for payment (note re. ZUGFeRD: ZUGFeRD also permits other invoice types; see below).

893 • Payment means and terms stated at document level apply to the amount due for payment (in the
894 "total" section).

895 • Accounting details stated at document level must apply to all invoice lines..

896 • VAT information stated at document level must apply to all invoice lines. (see below for a more
897 detailed explanation, e.g. on handling multiple value added tax rates).

898 Stated paid amounts (in the "total" section must apply to the invoice as whole but not individual
899 line items.)

900 (Cf. MUG Rule 1 – General Rules.)

5.2.1 Mandatory fields in ZUGFeRD

901

902 ZUGFeRD contains mandatory fields defined by the European MUG standard as well as a few mandatory
903 fields on syntax level. As a basic principle, the content of the invoice is determined primarily based on the
904 legal requirments and the underlying business process, as is the case with paper invoices.

905 In ZUGFeRD, both the PDF representation of the invoice image and the structured invoice data (XML file)
906 must represent a complete invoice for themselves, and not only a subset of an invoice (e.g. containing
907 only the relevant payment information). In the XML file, the mandatory VAT information, the payment
908 information and the "items" section must always be completed in a structured manner in line with the
909 ZUGFeRD specifications.

910 In the case of these standardised data fields, the semantical identity of the invoice image and the struc-
911 tured invoice data is of utmost importance. If there are any differences in content between these data
912 fields and how they are shown on the invoice image, the invoices can no longer be deemed to be identical
913 copies with identical contents.[7]

---

[7] Cf. Section 14c.1. of the Ordinance on the Application of the Value Added Tax Act (*Umsatzsteuer-Anwendungserlass –*
UStAE) (4): [...] Where several invoices are issued for one and the same supply of goods or services and these respective
invoices are not marked as duplicates or copies, the enterprise is liable to pay the tax amount shown separately in the

914 Semantic identity is also guaranteed if, for example, coded information in the XML data is transferred as
915 free text in the image file. One example is the INVOICE document type (information in the image file) with
916 code 380 (information in the XML data).

917 Depending on the profile (Basic, Comfort, Extended), certain information can be supplied as free text or in
918 a structured form.

919 If the relevant information cannot be mapped in structured data fields, it may be put in corresponding
920 free text fields at invoice header or invoice item level, such as notes on reductions in payment.

921 This rule does not apply to any additional information which is not relevant to the invoice itself such as
922 advertising text. It can therefore be the case that an advertising text is shown in the image file but is not
923 transmitted in the XML data.

924 In doing so, any invoice of any complexity can be even be mapped to the Basic profile. But not all infor-
925 mation will be represented as structured information.

926 5.2.2 Handling free text information

927 As a general rule, free text cannot be analysed by a machine due to spelling and wording differences. In-
928 formation of this kind should therefore be identified by a unique text code where possible. This qualifica-
929 tion of text allows information to be processed automatically. Coding of this kind makes it possible to
930 check automatically for any references to an intra-community supply of goods, for instance. The wording
931 of free text cannot always be stipulated in practice. To be able to be processed automatically, the text
932 code must correspond to a specified value, which then represents the wording that can be formulated as
933 required:

934 The level stated on the invoice (Basic, Comfort, Extended) indicates what amount of structured data the
935 recipient can expect.

936 In the Basic profile, all free text is only shown in the field Included.Note = free text at document or item
937 level. The free text is not qualified, i.e. no subject code is used.

938 In the Comfort profile, certain free text is qualified in accordance with the code list (use of a subject code)
939 or added in at the appropriate places (e.g. tax exemptions). This allows computers to automatically de-
940 termine the type of the information provided (e.g. AAK = text on payment reductions) and the presence of
941 a required piece of information on the invoice is confirmed regardless of how it is spelt or worded in the
942 individual case. In cases where a subject code is defined (cf. code lists), it must be used. In the case of
943 general free text, no text qualification (subject code) is used in either the Comfort or Extended profile.

---

invoices [...] This this does not apply when several copies of the same invoice with identical contents (cf. Section 14 (4)

of the Value Added Tax Act) are sent. [...]

The Extended profile also offers the option of codifying the content of the text in order to ensure that it can be evaluated automatically in its entirety. To make sure that invoicees who do not have this functionality can process content of this kind, the text must always be provided in addition to the text code.

Example: (**Information on payment reduction as qualified free text at header level**)

Basic profile:
```
<ram:IncludedNote>
    <ram:Content>Discount or bonus agreements apply.</ram:Content>
</ram:IncludedNote>
```

Comfort profile:
```
<ram:IncludedNote>
    <ram:Content>Discount or bonus agreements apply.</ram:Content>
    <ram:SubjectCode>AAK</ram:SubjectCode>
</ram:IncludedNote>
```

Extended profile:
```
<ram:IncludedNote>
    <ram:ContentCode>ST3</ram:ContentCode>
    <ram:Content>Discount or bonus agreements apply.</ram:Content>
    <ram:SubjectCode>AAK</ram:SubjectCode>
</ram:IncludedNote>
```

Example 4: Information on a payment reduction in the various profiles

For a more detailed explanation on using free text and qualifications, see the enclosed ZUGFeRD code lists.

Particularly if the XML file is used as the invoice, all information contained in the invoice (whether structured or as free text) should be adopted in respect of the invoicee. Structured information should be converted into free text to enable it to be used in a manual process. The recipient's software must therefore show unknown fields as free text. Otherwise, the only options are using the XML data just as a help to accounting or hybrid processing (with the invoice then being checked based on the PDF image). See also Figure 17 in this regard.

958

959 The ZUGFeRD data model assumes that the **seller** combines, by default, always the <u>taxable person</u> and,

960 among other things, also the role of <u>supplier</u>, <u>seller</u>, <u>invoice issuer</u> and <u>payee</u>. All information on the seller

961 is therefore defined at document level. The same applies to the role of **buyer**, who is, by default, always

962 the <u>customer</u> and, among other things, also the <u>ship-to party</u>, the <u>invoicee</u> and the <u>payer</u>. If other parties

963 perform individual rules, this information must be added in the appropriate places or as free text.

964 For convenience, the structure and fields to describe a party has been used consistently in all occurances,

965 even though this is not always necessary (e.g. VAT ID no. for the ultimate ship-to party).

966 The following information of a role can be shown in ZUGFeRD in a structured form:

967 • Name

968 • Address

969 • ID number, e.g. buyer number (Comfort profile and upwards)

970 • Global ID number, e.g. GLN or DUNS number (Comfort profile and upwards).
971 All relevant schema as per ISO 6523 apply here (see ZUGFeRD code lists)

972 • Tax ID number (tax number and/or VAT ID no.)

973 • Contact with contact information (Extended profile only)

974

```xml
Example:
    <ram:SellerTradeParty>
     <ram:GlobalIDschemeID="0088">4000001123452</ram:GlobalID>
     <ram:Name>Lieferant GmbH</ram:Name>
     <ram:PostalTradeAddress>
        <ram:PostcodeCode>80333</ram:PostcodeCode>
        <ram:LineOne>Lieferantenstraße 20</ram:LineOne>
        <ram:CityName>Munich</ram:CityName>
        <ram:CountryID>DE</ram:CountryID>
     </ram:PostalTradeAddress>
     <ram:SpecifiedTaxRegistration>
        <ram:ID schemeID="FC">201/113/40209</ram:ID>
     </ram:SpecifiedTaxRegistration>
     <ram:SpecifiedTaxRegistration>
        <ram:ID schemeID="VA">DE123456789</ram:ID>
     </ram:SpecifiedTaxRegistration>
    </ram:SellerTradeParty>
```

975 *Example 5: Partner information*

976 The name and address plus, if required by law, the tax identification number must always be entered in a

977 structured form in all ZUGFeRD profiles.

978 <u>The table below illustrates the relationships between the roles and the associated designations:</u>

979

Context	Explanation	Role
Sender		
Trade	**Principal role**	Seller (syn. Supplier)
Tax	Designation for tax purposes	Taxable person
(Invoicing)	Additional role, if different **NOT required in ZUGFeRD.**	(Invoicer)
Payment	Additional role, if different	Payee
Delivery	Additional role, if different	Ship-from party
Receiver		
Trade	**Principal role**	Buyer
Tax	Designation for tax purposes	Customer
Invoicing	Additional role, if different	Invoicee
(Payment)	Additional role, if different **NOT required in ZUGFeRD.**	(Payer)
Delivery	Additional role, if different	Ship-to party
	Additional role, if different	Ultimate ship-to party
	Additional role, if different	Product end user

980 *Table 1: Roles in a ZUGFeRD context*

981 Particular business processes may require the logistical supply chain to be shown in several stages and can
982 also be mapped using ZUGFeRD.

983

984 ***Alternative recipient of goods***

985 Example: ordering by one of the buyer's central warehouses followed by direct delivery by the seller to
986 one of the buyer's branches. Models of this kind can also be mapped in ZUGFeRD by entering a different
987 ship-to party.

988 If the ship-to party (e.g. in the case of international transactions) or, in the case of virtual goods, the recip-
989 ient has to be shown separately on an invoice, then this is done by adding the "ShipToTradeParty".

990

991

992

```
Example:

<ram:ShipToTradeParty>
   <ram:GlobalID schemeID="0088">4304171088093</ram:GlobalID>
    <ram:Name>MUSTER-MARKT</ram:Name>
   <ram:DefinedTradeContact>
      <ram:DepartmentName>8211</ram:DepartmentName>
   </ram:DefinedTradeContact>
   <ram:PostalTradeAddress>
      <ram:PostcodeCode>31157</ram:PostcodeCode>
      <ram:LineOne>HAUPTSTRASSE 44</ram:LineOne>
      <ram:CityName>SARSTEDT</ram:CityName>
      <ram:CountryID>DE</ram:CountryID>
   </ram:PostalTradeAddress>
</ram:ShipToTradeParty>
```

993   *Example 6: Entering an alternative ship-to party*

994   ***Alternative ultimate-ship-to party***

995   Example: Ordering by a central warehouse of the customer and subsequent direct delivery by the supplier
996   to a branch of the customer. Such models can be mapped in ZUGFeRD by specifying an UltimateShipTo-
997   TradeParty.

```
998
999    Example:
1000
1001   <ram:UltimateShipToTradeParty>
1002     <ram:Name>Zacharias Zielempfänger</ ram:Name>
1003     <ram:PostalTradeAddress>
1004       <ram:PostcodeCode>53797</ram:PostcodeCode>
1005       <ram:LineOne>Target road 7</ram:LineOne>
1006       <ram:CityName>LOHMAR</ram:CityName>
1007       <ram:CountryID>DE</ram:CountryID>
1008       </ram:PostalTradeAddress>
1009   </ram:UltimateShipToTradeParty>
1010
```

1011   *Example 7: Entering an alternative ultimate-ship-to party*

1012

1013 ***Alternative end-consumer***

1014 Example: order from an end buyer/product end user to the buyer's market directly, followed by delivery

1015 straight to this end buyer (no pick-up on the market). This can also be mapped in ZUGFeRD by entering a

1016 different end buyer.

1017

```
1018  Example:
1019
1020  <ram:ProductEndUserTradeParty>
1021    <ram:Name>Emil Endanwender</ ram:Name>
1022    <ram:PostalTradeAddress>
1023      <ram:PostcodeCode>53797</ram:PostcodeCode>
1024      <ram:LineOne>Anwenderpfad 4</ram:LineOne>
1025      <ram:CityName>LOHMAR</ram:CityName>
1026      <ram:CountryID>DE</ram:CountryID>
1027    </ram:PostalTradeAddress>
1028  </ram:ProductEndUserTradeParty>
1029
```

1030 *Example 8: Entering an alternative end consumer*

1031

5.2.4 Calculation matrix for invoice totals

To enable core invoices to be processed in ERP systems, the calculation of each amount and its interrelationships are fixed. The following calculation matrix applies to all amounts at document level:

Amounts used in the calculation		Sample amounts
+	Sum of line amounts	321.82
+	Sum of document level charge amounts	7.60
-	Sum of document level allowance amounts	9.20
=	Invoice total amount without VAT[8]	320.22
+	VAT total amount (Tax amount)	39.78
=	Invoice total with VAT (Grand total amount)	**360.00**
-	Paid amounts	120.00
=	Amount due for payment	**240.00**

Figure 8: Calculation matrix for invoice totals

```
Example for the "Invoice total" section:

<ram:SpecifiedTradeSettlementMonetarySummation>
   <ram:LineTotalAmount currencyID="EUR">321.82</ram:LineTotalAmount>
   <ram:ChargeTotalAmount currencyID="EUR">7.60</ram:ChargeTotalAmount>
   <ram:AllowanceTotalAmount currencyID="EUR">9.20</ram:AllowanceTotalAmount>
   <ram:TaxBasisTotalAmount currencyID="EUR">320.22</ram:TaxBasisTotalAmount>
   <ram:TaxTotalAmount currencyID="EUR">39.78</ram:TaxTotalAmount>
   <ram:GrandTotalAmount currencyID="EUR">360.00</ram:GrandTotalAmount>
   <ram:TotalPrepaidAmount currencyID="EUR">120.00</ram:TotalPrepaidAmount>
   <ram:DuePayableAmount currencyID="EUR">240.00</ram:DuePayableAmount>
</ram:SpecifiedTradeSettlementMonetarySummation>
```

Example 9: Displaying invoice totals

The same calculation matrix is used for invoices subject to taxes other than VAT (e.g. insurance tax) where the taxes in question are calculated using the same rules as for VAT. In this case, the invoice total amount excluding VAT corresponds to the invoice total amount excluding insurance tax. The corresponding tax type is shown in the relevant fields in coded form.

---

[8] Note: In the case of invoices with VAT, the invoice total amount excluding VAT corresponds to the tax base amount unless the invoice includes items involving non-taxable sales (VAT category "O").

1051	The same calculation matrix is used for invoices not subject to VAT, such as bills of fees or small business
1052	invoices. In this case, the invoice total amount excluding VAT corresponds to the grand total amount of
1053	the invoice, with a total tax amount of zero. In accordance with statutory provisions, it may be necessary
1054	to state an exemption from tax, giving reasons (cf. enclosed example calculations).

1055	***Validation rules***
1056	• Invoice Sum of line amount MUST be the equal to the Sum of all Invoice line net amountsInvoice total
1057	without VAT MUST equal the Sum of line amounts minus Allowances on document level and plus
1058	Charges on document level.
1059	• Invoice total with VAT MUST equal the Invoice total without VAT) plus the total VAT.
1060	• If a Document level allowance amount exists in an invoice, Allowances on document level amount
1061	MUST be equal to the sum of all Document level allowance amounts.
1062	• If a Document level charge amount exists in an invoice, Charges on document level amount MUST be
1063	equal to the sum of all Document level charge amounts.
1064	Amount due for payment MUST be equal to the Invoice total with VAT (value of purchase) minus Paid
1065	amounts.
1066	(cf. MUG Rule 2 – Calculation of invoice total).

1067 ## 5.3 Check under Section 14 of the Value Added Tax Act

1068 The statutory requirements made of an invoice must be fulfilled for the invoicee to be entitled to deduct
1069 input tax on receiving invoices that include VAT.

1070 The check under Section 14 of the Value Added Tax Act can be performed in an essentially automated
1071 process. Depending on the business transaction in question, fewer or extra mandatory pieces of infor-
1072 mation are required on the invoice. For instance, the VAT ID number of the customer (buyer) need only be
1073 entered if the invoice relates to an intra-Community supply of goods.

1074

1075 **In accordance with Section 14 (4) and Section 14a of the Value Added Tax Act, an invoice must include**
1076 **the following information:**

Name of the customer in accordance with Section 14 (4) of the Value Added Tax Act	Grouping of trade agreement information > Buyer name
Customer's address	Grouping of trade agreement information > Details of the buyer's address

```
Example:
<ram:BuyerTradeParty>
   <ram:Name>MUSTER-KUNDE GMBH</ram:Name>
   <ram:PostalTradeAddress>
      <ram:PostcodeCode>40235</ram:PostcodeCode>
      <ram:LineOne>KUNDENWEG 88</ram:LineOne>
      <ram:CityName>DÜSSELDORF</ram:CityName>
      <ram:CountryID>DE</ram:CountryID>
   </ram:PostalTradeAddress>
</ram:BuyerTradeParty>
```

1077 *Example 10: Displaying the customer*

1078

Name of the taxable person	Grouping of trade agreement information > Seller's name
Address of the taxable person	Grouping of trade agreement information > Details of the seller's address
Tax number or VAT ID number of the taxable person	Grouping of trade agreement information > Details of the seller's tax information - Seller's tax number or - Seller's VAT ID number

```xml
Example:
<ram:SellerTradeParty>
  <ram:Name>MUSTERLIEFERANT GMBH</ram:Name>
  <ram:PostalTradeAddress>
    <ram:PostcodeCode>99199</ram:PostcodeCode>
    <ram:LineOne>BAHNHOFSTRASSE 99</ram:LineOne>
    <ram:CityName>MUSTERHAUSEN</ram:CityName>
    <ram:CountryID>DE</ram:CountryID>
  </ram:PostalTradeAddress>
  <ram:SpecifiedTaxRegistration>
    <ram:ID schemeID="VA">DE123456789</ram:ID>
  </ram:SpecifiedTaxRegistration>
</ram:SellerTradeParty>
```

1079 *Example 11: Displaying the taxable person*

1080

Invoice date	Grouping of characteristics relating to the entire document > Invoice date
Invoice number (serial number)	Grouping of characteristics relating to the entire document > Invoice number

```xml
Example:
<rsm:HeaderExchangedDocument>
  <ram:ID>R87654321012345</ram:ID>
  <ram:IssueDateTime>
    <udt:DateTimeString format="102">20130806</udt:DateTimeString>
  </ram:IssueDateTime>
</rsm:HeaderExchangedDocument>
```

1081 *Example 12: Information on invoice number and invoice date*

Date of delivery or date of provision of good or service	Grouping of delivery information > Details of the actual delivery > Actual delivery time (delivery and provision date under VAT law)

```
Example:
<ram:ActualDeliverySupplyChainEvent>
    <ram:OccurrenceDateTime>
        <udt:DateTimeString format="102">20140625</udt:DateTimeString>
    </ram:OccurrenceDateTime>
</ram:ActualDeliverySupplyChainEvent>
```

1082   *Example 13: Specifying the delivery date and the date on which the good or service is provided*

1083

Quantity of items delivered or goods/services provided	Grouping of delivery information from item level > Quantity, calculated
Type (standard commercial designation) of the items delivered or scope of the goods/services provided	Grouping of information on the product or the service provided > Article designation
Payment (coded based on tax rates and individual tax exemptions)	Grouping of settlement information > Details of tax information > Base amount for tax calculation or invoice total excluding VAT (document totals)
Tax rate	Grouping of settlement information > Details of tax information > Percentage tax rate and, as appropriate, at item level
Tax amount attributable to payment	Grouping of settlement information > Details of tax information > Tax base amount or total tax amount (document totals)

1084   *Example 14: Specifying the type and quantity of services provided*

1085

```
Example of an invoice line item:

<ram:IncludedSupplyChainTradeLineItem>
   <ram:AssociatedDocumentLineDocument>
      <ram:LineID>1</ram:LineID>
   </ram:AssociatedDocumentLineDocument>
<ram:SpecifiedSupplyChainTradeAgreement>
   <ram:GrossPriceProductTradePrice>
      <ram:ChargeAmount currencyID="EUR">1.0000</ram:ChargeAmount>
   </ram:GrossPriceProductTradePrice>
   <ram:NetPriceProductTradePrice>
      <ram:ChargeAmount currencyID="EUR">1.0000</ram:ChargeAmount>
   </ram:NetPriceProductTradePrice>
   </ram:SpecifiedSupplyChainTradeAgreement>
      <ram:SpecifiedSupplyChainTradeDelivery>
      <ram:BilledQuantity unitCode="C62">100.0000</ram:BilledQuantity>
   </ram:SpecifiedSupplyChainTradeDelivery>
   <ram:SpecifiedSupplyChainTradeSettlement>
      <ram:ApplicableTradeTax>
         <ram:TypeCode>VAT</ram:TypeCode>
         <ram:CategoryCode>S</ram:CategoryCode>
         <ram:ApplicablePercent>19.00</ram:ApplicablePercent>
      </ram:ApplicableTradeTax>
      <ram:SpecifiedTradeSettlementMonetarySummation>
         <ram:LineTotalAmount currencyID="EUR">100.00
         </ram:LineTotalAmount>
      </ram:SpecifiedTradeSettlementMonetarySummation>
   </ram:SpecifiedSupplyChainTradeSettlement>
   <ram:SpecifiedTradeProduct>
      <ram:SellerAssignedID>ZS997</ram:SellerAssignedID>
      <ram:Name>Citric acid 100 ml</ram:Name>
   </ram:SpecifiedTradeProduct>
</ram:IncludedSupplyChainTradeLineItem>
```

1086   *Example 15: Example of an invoice item*

```
Example showing tax amounts for each tax rate at document level:

<ram:ApplicableTradeTax>
   <ram:CalculatedAmount currencyID="EUR">61.07</ram:CalculatedAmount>
   <ram:TypeCode>VAT</ram:TypeCode>
   <ram:BasisAmount currencyID="EUR">321.40</ram:BasisAmount>
   <ram:CategoryCode>S</ram:CategoryCode>
   <ram:ApplicablePercent>19.00</ram:ApplicablePercent>
</ram:ApplicableTradeTax>


<ram:ApplicableTradeTax>
   <ram:CalculatedAmount currencyID="EUR">8.93</ram:CalculatedAmount>
   <ram:TypeCode>VAT</ram:TypeCode>
   <ram:BasisAmount currencyID="EUR">127.59</ram:BasisAmount>
   <ram:CategoryCode>S</ram:CategoryCode>
   <ram:ApplicablePercent>7.00</ram:ApplicablePercent>
</ram:ApplicableTradeTax>


Example in invoice totals:

<ram:SpecifiedTradeSettlementMonetarySummation>
     <ram:TaxBasisTotalAmount currencyID="EUR">448.99
     </ram:TaxBasisTotalAmount>
     <ram:TaxTotalAmount currencyID="EUR">70.00</ram:TaxTotalAmount>
     <ram:GrandTotalAmount currencyID="EUR">518.99</ram:GrandTotalAmount>
</ram:SpecifiedTradeSettlementMonetarySummation>
```

1087   *Example 16: Showing tax amounts at document level*

1088

1089	**5.3.1**	**Calculation and implementation of VAT**

1090 The points set out below apply to invoices which are relevant for the purposes of VAT. For invoices subject

1091 to taxes other than VAT (e.g. insurance tax), the calculation is carried out in the same way. The points

1092 mentioned here do not apply to invoices which do not include VAT (e.g. penalty notices).

1093 1094	•	The line amount is generally the VAT taxable amount of each line. An exception is items involving non-taxable sales, where the taxable amount (tax base amount) is 0.00.
1095 1096 1097	•	VAT exempted lines and items involving non-taxable sales are identified with a VAT category code that carries zero percentage (0.00) and are reflected in the VAT subtotal in an identical way as zero rated items and with an exemptionreason.
1098 1099	•	For each VAT category code used on line level VAT sub-category details must be provided on document level
1100 1101 1102	•	An electronic core invoice must include the VAT ID number or the tax number of the taxable person if the invoice in question is governed by the Value Added Tax (exceptions include invoices for court costs, invoices for insurance).
1103 1104 1105	•	A Core Invoice VAT total MUST refer to a single tax scheme, therefore in ZUGFeRD, only one VAT rule may be applied in an electronic core invoice, either normal taxation including tax exemptions (see example below) or reverse charge.
1106 1107	•	The "Details on tax information" must always be given in ZUGFeRD, even if there is only one VAT rate/tax category.

1108 ***Validation rules:***

1109 1110 1111	•	The VAT taxable amount in each VAT sub-category on document level MUST equal the sum of line amounts and of allowances and charges on document level for each VAT category code, provided the invoice does not include items involving non-taxable sales.
1112 1113 1114 1115 1116	•	The sum of VAT category taxable amounts MUST equal the Invoice total without VATamount, provided the invoice does not include items involving non-taxable sales. For items involving non-taxable sales, the information can be displayed in the "Goods amount for tax rate" field. The total of all "Goods amounts for tax rate" for each VAT rate/tax category always gives the "Invoice total amount excluding VAT".
1117 1118	•	The VAT category tax amount MUST equal the VAT category taxable amount multiplied by the VAT category percentage
1119 1120	•	The VAT total amount (total tax amount) MUST equal the sum of the subcategory VAT category tax amounts.

1121

1122 ***Example:***

1123 An invoice has the following line details (example values are arbitrary). In this example the items sold car-

1124 ry three different VAT percentage rates one of which is zero. There is also a line which is exempted as well

1125 as a charge on document level that carries VAT.

1126

Line	Line amount (a)	VAT rate (b)	VAT category (b)
1127 Line	Line amount (a)	VAT rate (b)	VAT category (b)
1128 1	125.00	20%	S = standard rate
1129 2	24.00	10%	S = standard rate
1130 3	136.00	20%	S = standard rate
1131 4	95.00	10%	S = standard rate
1132 5	100.00	0%	O = non-taxable
1133 6	10.00	0%	E = tax exempt

1134 *Figure 9: Handling different tax rates*

1135

1136 ***The invoice also contains the following information at document level:***

1137 Charge/Allowance	Charge amount (a)	VAT rate (b)	VAT category (b)
1138 Charge	20.00	20%	S = standard rate

1139 ***Based on the information above, the invoice contains the following information at document level:***

1140

1141 <u>VAT rate 20%</u>

1142   VAT taxable amount (c) =

1143   Sum of line amounts (Line amount for this tax rate = 261.00) plus and charge amount (a) for the
1144   VAT rate of 20% (Charges and allowances at document level for this tax rate = 20.00) = 281.00.

1145   VAT rate = 20.00%

1146   VAT category = S (standard rate)

1147   VAT amount (d) = VAT taxable amount (c) * 20.00% = 56.20

1148

1149 <u>VAT rate 10%</u>

1150   VAT taxable amount (c) =

1151   Sum of line amounts (Goods Line amount for this tax rate = 119.00) for the VAT rate of 10% =
1152   119.00.

1153   VAT rate = 10.00%

1154   VAT category = S (standard rate)

1155   VAT amount (d) = VAT taxable amount (c) * 10.00% = 11.90
1156

1157	VAT rate 0% (category "O" = non-taxable)
1158	Sum of line amounts for non-taxable sales (Goods amount) = 100.00
1159	VAT taxable amount (c) for the tax category "O" = 0.00*.
1160	VAT rate = 0.00%
1161	VAT category = O (Outside scope of tax)
1162	VAT amount (d) = VAT base amount (c) * 0.00% = 0.00
1163	
1164	Note:
1165	VAT rate 0% is applied for calculation purposes even if item is outside scope of VAT.
1166	
1167	Note:
1168	On invoices involving non-taxable sales, the VAT taxable amount (base amount) = 0, even though
1169	the total of the item amounts (value of the goods) is not 0!
1170	The value of the goods may be indicated separately as "Goods amount per tax rate".
1171	
1172	VAT rate 0% (category "E" = Exempt from tax)
1173	VAT taxable amount (c) = Sum of line amounts at this tax rate (Goods amount for tax rate = 10.00)
1174	for the tax category "E" = 10.00.
1175	VAT tax rate = 0.00%
1176	VAT category = E (Exempt from tax)
1177	VAT amount (d) = VAT taxable amount (c) * 0.00% = 0.00
1178	
1179	Note:
1180	The reason for the tax exemption MUST be stated in these cases.
1181	

1182 ***This example produces the following figures for the "total" section:***

1183

Amounts used in the calculation	Example amounts
+ Sum of line amounts	490.00
- Sum of document level allowance amounts	0.00
+ Sum of document level charge amounts	20.00
= Invoice total amount without VAT	510.00
+ VAT total amount (tax amount)	68.10
= Invoice total with VAT (Grand total amount)	**578.10**
- Paid amounts	0.00
= Amount due for payment	**578.10**

1194 *Figure 10: Example calculation of document totals*

1195

1196 (Cf. MUG Rule 3 – Calculation of VAT with amendments for ZUGFeRD)

1197 <u>Note on the implementation of combined articles according to German VAT rules</u>

1198 An example of a combined article is a set in which the contents of the set are subject to different rates of
1199 VAT (e.g. a combination of food (7%) and equipment (19%)). If certain limits are exceeded, the VAT rates
1200 must be shown separately. In ZUGFeRD, this cannot be presented using sub-items. Instead, an item must
1201 be displayed for each rate of VAT.

1202

5.3.2 Additional mandatory information in an invoice under Section 14 (4) and Section 14a of the Value Added Tax Act

Further additional mandatory information in an invoice may include:

Note on tax exemption (e.g. intra-Community supplies, export, etc.)	Grouping of settlement information > Details of tax information > Reason for the tax exemption and, as appropriate, at item level
Customer's VAT identification number (Section 14a (1) and (3) of the Value Added Tax Act)	Grouping of trade agreement information > Details of the buyer's tax information > Buyer's VAT identification number
Note on reduction in payment or reference to existing framework contracts which may give rise to subsequent reductions in payment (e.g. annual bonuses)	Grouping of characteristics relating to the entire document > Free text at header level
Note on the customer's obligation to store invoices (Section 14b (1) sentence 5)	Grouping of characteristics relating to the entire document > Free text at header level
Note on the application of the reverse charge procedure	Grouping of settlement information > Details of tax information > Tax category and reason for tax exemption (free text)
Note on taxation of margin schemes (Section 14a (6) of the Value Added Tax Act)	Grouping of characteristics relating to the entire document > Free text at header level
Information for the intra-Community delivery of a new vehicle (Section 14a (4) of the Value Added Tax Act)	Grouping of characteristics relating to the entire document > Free text at header level

Example 17: Additional mandatory information

In business relationships involving regular electronic invoicing, significant potential for savings can be achieved for the receiving partner, especially in instances where automated machine processing and verification is possible. This means that under normal circumstances, checks carried out on incoming invoices to ensure that they include all of the required statutory data must be possible based solely the XML data, without also having to resort to the actual image of the invoice.

Given that a check for the wording of free text fields can only be automated to a limited extent, it is possible that text modules may be quantified. In this respect, it is sufficient if the text key confirms the presence of a required item of information on the invoice.

Additional information on the seller, which normally appears on the invoice but is not a mandatory requirement under Section 14 of the Value Added Tax Act, can be mapped in the **free text at header level**. From the Comfort profile upwards, this information is qualified using the subject code REG (regulatory information).

1219   Particular mention should be made here of any information regarding the seller besides the company

1220   address, and which on a paper-based invoice is normally already printed on the company letterhead:

1221   • Partners/managers/board of directors

1222   • Commercial register number

1223   • Competent court of registration

1224

```
Example (Comfort profile):

<ram:IncludedNote>
      <ram:Content>MUSTERLIEFERANT GMBH
BAHNHOFSTRASSE 99
99199 MUSTERHAUSEN
Management:
Max Mustermann
VAT ID no.: DE123456789
Phone: +49 932 431 0
www.musterlieferant.de
HRB 372876
District Court Musterstadt
GLN 4304171000002
WEEE registration no.: DE87654321</ram:Content>
   <ram:SubjectCode>REG</ram:SubjectCode>
</ram:IncludedNote>
```

1225   *Example 18: Mandatory information on the seller*

1226   ### 5.3.3   Reverse charge procedure

1227   An issuer of an invoice is required to indicate when an invoice is a reverse charge invoice. For simplifica-

1228   tiona Core Invoice can only be reverse charge invoice as a whole. Partial reverse charge Core Invoices

1229   where VAT is charged on some lines are not allowed and the taxable amount for reverse charge VAT

1230   musttherefore equal the invoice total amount with VAT.

1231   A Core Invoice applies this by using the VAT category "AE" (Reverse Charge) in the document level of the

1232   invoice. Consequently when the AE code is used in an invoice, other category identifiers may not be used

1233   in the same invoice and the taxable amount that applies to the "AE" VAT subtotal must equal the invoice

1234   tax exclusive total. It is optional to provide line level categorization in reverse charge invoices.

1235   In the electronic invoice existence of the code "AE" indicates that the invoice relates to the reverse charge

1236   procedure. As a result, a corresponding free text may not be required provided this is legally possible in

1237   the respective country.

1238 It is the responsibility of the seller (taxable person) to issue an invoice as a reverse charge invoice when
1239 required. The following rules do not verify if that decision is correct. They only check whether the infor-
1240 mation is correctly stated in the invoice.

1241 In the case of reverse charge invoices, the taxable amount included in the details on tax information is <u>not</u>
1242 `0.00`, but instead corresponds to the goods amount for the tax rate AE, with charges and allowances
1243 where appropriate.

1244 ***Validation rules***

1245 • A Core Invoice that contains VAT category code with code value "AE" MUST contain Sellers VAT
1246   identification AND Buyer VAT identification

1247 • A core invoice that contains a VAT category with code value "AE" MUST NOT contain other VAT
1248   categories. The VAT category taxable amount for a VAT category with VAT category code as "AE"
1249   MUST equal the Invoice total without VAT.

1250 • The VAT category tax amount for category "AE" MUST equal zero (0.00).

1251 • Since there is only one VAT category allowed it follows that the invoice VAT total amount for re-
1252   verse charge invoices is zero (0.00) and Invoice total with VAT equals Invoice total without VAT.

1253

1254 (Cf. MUG Rule 4 – Reverse Charge VAT)

1255 ### 5.3.4   Intra-Community Supply

1256 An issuer of an invoice is required to indicate when an invoice is an intra community supply invoice. For
1257 simplification a Core Invoice can only bean intra community supply invoice as a whole. Invoices with par-
1258 tial intra community supplies are not allowed and the taxable amount for intra community supply VAT
1259 must therefore equal the invoice total amount with VAT.

1260 A Core Invoice applies this by using the VAT category "IC" (intra-Community supply of goods) in the docu-
1261 ment level of the invoice. Consequently when the "IC" code is used in an invoice, other category identifi-
1262 ers may not be used in the same invoice and the taxable amount that applies to the "IC" VAT subtotal
1263 must equal the invoice tax exclusive total. It is optional to provide line level categorization in intra com-
1264 munity supply invoices.

1265 In the electronic invoice existence of the code "IC" constitutes a declaration that the invoice is an intra
1266 community supply invoice. As a result, a corresponding free text may not be required provided this is le-
1267 gally possible in the respective country.

1268 It is the responsibility of the seller (taxable person) to issue an invoice as invoice as an intra community
1269 supply invoice when required. The following rules do not verify if that decision is correct. They only check
1270 whether the information is correctly stated in the invoice.
1271

1272	***Validation rules***
1273 1274	• A Core Invoice that contains VAT category code with code value "IC" MUST contain Sellers VAT identification AND Buyer VAT identification
1275 1276	• A core invoice that contains a VAT category (INV052) with code value "IC" MUST NOT contain other VAT categories.
1277 1278	• The VAT category taxable amount for a VAT category with VAT category code as "IC" MUST equal the Invoice total without VAT.
1279	• The VAT category tax amount for category "IC" MUST equal zero (0.00).
1280 1281 1282	• Since there is only one VAT category allowed it follows that the invoice VAT total amount for intra community supply invoices is zero (0.00) and Invoice total with VAT equals Invoice total without VAT.
1283	
1284	(Cf. MUG Rule 5 – Intra-Community Supply)
1285	<u>Note:</u>
1286	If the country of departure or the country of destination for the goods is to be indicated in invoices relat-
1287	ing to intra-Community supplies of goods or supplies of goods to/from third countries, this is possible in
1288	ZUGFeRD as follows:
1289 1290	• Country of departure for the goods (if not the seller) = different ship-from party, with details of the country
1291 1292	• Country of destination for the goods (if not the buyer) = different ship-to party, with details of the country.
1293	

1294 ## 5.4 Mathematical check

1295 In addition to checking an invoice to ensure that all of the mandatory information is complete, an auto-

1296 mated **mathematical check** is also possible using ZUGFeRD.

1297 ZUGFeRD supports both **net and gross calculations** (i.e. including charges and allowances). For charges

1298 and allowances at accounting record level, the relevant tax case can be indicated.

1299 For more extensive automation, all relevant amount fields which normally appear on the invoice image

1300 can also be specified in structured form. By sending the results or interim results electronically, the recipi-

1301 ent does not calculate these amounts himself. The advantage of this is that the individual steps involved in

1302 the calculation can be followed; rounding differences are also avoided by using different sequences in the

1303 aggregation.

1304 Examples include:

Total amount of charges and allowances per VAT rate in the "total" section	Grouping of settlement information > Details of applicable tax information > Total amount of allowances and charges at header level
Value of goods from the accumulated individual items per VAT rate "total" section	Grouping of settlement information > Details of applicable tax information > Line Total Basis Amount (Goods amount for tax rate)

1305 *Figure 11: Charges and allowances*

```
Examples of details at document level:

a) Total charges/allowances per VAT rate

<ram:ApplicableTradeTax>
   <ram:CalculatedAmount currencyID="EUR">61.07</ram:CalculatedAmount>
   <ram:TypeCode>VAT</ram:TypeCode>
   <ram:BasisAmount currencyID="EUR">321.40</ram:BasisAmount>
   <ram:LineTotalBasisAmount currencyID="EUR">326.50
      </ram:LineTotalBasisAmount>
   <ram:AllowanceChargeBasisAmount currencyID="EUR">-5.10
      </ram:AllowanceChargeBasisAmount>
   <ram:CategoryCode>S</ram:CategoryCode>
   <ram:ApplicablePercent>19.00</ram:ApplicablePercent>
</ram:ApplicableTradeTax>
```

1306   *Example 19: Charges and allowances per VAT rate*

1307

```
b) Charges/allowances at document level

<ram:SpecifiedTradeAllowanceCharge>
   <ram:ChargeIndicator><udt:Indicator>false</udt:Indicator>
   </ram:ChargeIndicator>
   <ram:BasisAmount currencyID="EUR">130.70</ram:BasisAmount>
   <ram:ActualAmount currencyID="EUR">0.50</ram:ActualAmount>
   <ram:Reason>Invoice amount 2</ram:Reason>
   <ram:CategoryTradeTax>
      <ram:TypeCode>VAT</ram:TypeCode>
      <ram:CategoryCode>S</ram:CategoryCode>
      <ram:ApplicablePercent>7.00</ram:ApplicablePercent>
   </ram:CategoryTradeTax>
</ram:SpecifiedTradeAllowanceCharge>
```

1308   *Example 20: Charges and allowances at document level*

1309

```
c) Transport/packaging costs at document level

<ram:SpecifiedLogisticsServiceCharge>
   <ram:Description>Transport costs</ram:Description>
   <ram:AppliedAmount currencyID="EUR">3.00</ram:AppliedAmount>
   <ram:AppliedTradeTax>
      <ram:TypeCode>VAT</ram:TypeCode>
      <ram:CategoryCode>S</ram:CategoryCode>
      <ram:ApplicablePercent>19.00</ram:ApplicablePercent>
   </ram:AppliedTradeTax>
</ram:SpecifiedLogisticsServiceCharge>
```

1310   *Example 21: Transport/packaging costs at document level*

1311

```
Example of aggregation in the invoice totals:

<ram:ApplicableSupplyChainTradeSettlement>
   <ram:SpecifiedTradeSettlementMonetarySummation>
      <ram:LineTotalAmount currencyID="EUR">457.20</ram:LineTotalAmount>
      <ram:ChargeTotalAmount currencyID="EUR">3.00</ram:ChargeTotalAmount>
      <ram:AllowanceTotalAmount currencyID="EUR">11.21
               </ram:AllowanceTotalAmount>
      <ram:TaxBasisTotalAmount currencyID="EUR">448.99
               </ram:TaxBasisTotalAmount>
      <ram:TaxTotalAmount currencyID="EUR">70.00</ram:TaxTotalAmount>
      <ram:GrandTotalAmount currencyID="EUR">518.99</ram:GrandTotalAmount>
   </ram:SpecifiedTradeSettlementMonetarySummation>
</ram:ApplicableSupplyChainTradeSettlement>
```

1312   *Example 22: Aggregation of charges and allowances in the "total" section*

1313

1314 **5.4.1 Price calculation**

1315 The net price (price based on the net calculation excluding VAT) MUST equal the gross price (price based

1316 on the net calculation excluding VAT) less the amount of the charge/allowance on this gross price (exam-

1317 ple: net price 10.0000 = gross price 12.0000 – allowance on gross price 2.0000). Where there are several

1318 charges or allowances, the total of the charges or allowances for this item are deducted.

1319

```
Example: Net price 10.0000 = gross price 12.0000 – allowance on gross price 2.0000:

<ram:GrossPriceProductTradePrice>
   <ram:ChargeAmount currencyID="EUR">12.0000</ram:BasisAmount>
   <ram:AppliedTradeAllowanceCharge>
     <ram:ChargeIndicator>
       <udt:Indicator>false</udt:Indicator>
     </ram:ChargeIndicator>
     <ram:ActualAmount currencyID="EUR">2.0000</ram:ActualAmount>
   </ram:AppliedTradeAllowanceCharge>
</ram:GrossPriceProductTradePrice>
<ram:NetPriceProductTradePrice>
   <ram:ChargeAmount currencyID="EUR">10.0000</ram:BasisAmount>
</ram:NetPriceProductTradePrice>
```

1320 *Example 23: Price information at item level*

1321 ***Validation rules***

1322   • The net price MUST equal the gross price less the allowance (or charge) on the price.

1323 Note:

1324 Both the gross AND net price must always be stated even if no allowance or charge is indicated.

1325 (Cf. MUG Rule 8 – Price calculation with additions for ZUGFeRD)

1326

1327

5.4.2   Charges and allowances

Charges and allowances can be granted both at item level and document level, and are independent of one another.

Individual charges and allowances are always stated positively on invoices (not in the case of corrections to invoices or negative items) and are assigned using the charge/allowance switch (`true` = charge, `false` = allowance).

Charges and allowances at document level:

In the **Basic profile**, charges and allowances are only shown as total amounts (cf. calculation matrix) and not in a more detailed and structured breakdown.

From the **Comfort profile** upwards, individual charges and allowances can also be specified under Specified.Trade_Allowance Charge. Transport and packaging costs are stated separately under Specified.Logistics_ Service Charge. The result of the calculation to determine the discount is shown here in structured form. Details of the calculation can be transmitted as free text. The sum of all charges and allowances is stated under the "total" section (Monetary Summation).

In the **Extended profile**, several charges and allowances can be specified in detail.

Examples of charges/allowances at document level are shown above.

Charges and discounts at item level:

As described in rule 8 (Price Calculation), as far as charges and allowances are concerned, both the gross and the net price are given at all times whenever prices are stated in ZUGFeRD. If there are charges or allowances on the gross price, the individual charges and allowances are specified separately from the Comfort profile upwards. The result of the calculation to determine the allowances is shown here in structured form. Details of the calculation can be transmitted as free text. If, for example, a multi-level discount is granted at item level, only the result of the calculation to determine the discount is transmitted in structured form. The option exists to transmit each step in the calculation as free text.

In the **Extended profile**, several charges and allowances can be specified in detail. It would therefore be conceivable for a system receiving the invoice to recalculate the individual allowance steps. Moreover, the sum of these charges and allowances can be stated in the "total" section for this item.

Note:

In order to understand and follow charges and allowances, it is recommended to consult the example calculations as listed in the appendix.

Charges/allowances at item level	Grouping of trade agreement information at item level > Price details as per the gross calculation excluding VAT > Details of charges and allowances
Total amount of charges and allowances at article level	Grouping of settlement information at item level > Total amount of item charges and allowances

Example of allowances in an invoice line item (Extended profile):

```xml
<ram:IncludedSupplyChainTradeLineItem>
   <ram:SpecifiedSupplyChainTradeAgreement>
      <ram:GrossPriceProductTradePrice>
         <ram:ChargeAmount currencyID="EUR">1.5000</ram:ChargeAmount>
         <ram:AppliedTradeAllowanceCharge>
          <ram:ChargeIndicator>
             <udt:Indicator>false</udt:Indicator>
          </ram:ChargeIndicator>
          <ram:CalculationPercent>2.00</ram:CalculationPercent>
          <ram:BasisAmount currencyID="EUR">1.5000</ram:BasisAmount>
          <ram:ActualAmount currencyID="EUR">0.0300</ram:ActualAmount>
          <ram:Reason>Article allowance 1</ram:Reason>
         </ram:AppliedTradeAllowanceCharge>
         <ram:AppliedTradeAllowanceCharge>
          <ram:ChargeIndicator>
             <udt:Indicator>false</udt:Indicator>
          </ram:ChargeIndicator>
          <ram:BasisQuantity unitCode="C62">1</ram:BasisQuantity>
          <ram:ActualAmount currencyID="EUR">0.0200</ram:ActualAmount>
          <ram:Reason>Article allowance 2</ram:Reason>
         </ram:AppliedTradeAllowanceCharge>
      </ram:GrossPriceProductTradePrice>
      <ram:NetPriceProductTradePrice>
              <ram:ChargeAmount currencyID="EUR">1.4500</ram:ChargeAmount>
      </ram:NetPriceProductTradePrice>
   </ram:SpecifiedSupplyChainTradeAgreement>

..
```

1358   *Example 24: Charges and allowances at item level*

```
Example of total charges/allowances in an invoice item (Extended profile):


   <ram:SpecifiedSupplyChainTradeSettlement>

      <ram:SpecifiedTradeSettlementMonetarySummation>

            <ram:LineTotalAmount currencyID="EUR">58.20

            </ram:LineTotalAmount>

            <TotalAllowanceChargeAmount currencyID="EUR">1.80
            </TotalAllowanceChargeAmount>

      </ram:SpecifiedTradeSettlementMonetarySummation>

   </ram:SpecifiedSupplyChainTradeSettlement>



..

</ram:IncludedSupplyChainTradeLineItem>
```

Example 25: Charges and allowances at item level - continued –

5.4.3 Handling of commercial credit notes

For ZUGFeRD, it has been agreed that credit notes (corrected invoices/cancellations = commercial credit notes) can also be transmitted and, as a result, the amounts stated in the credit note may, in contrast to the list below, be negative.

The following amounts must not be negative in commercial credit notes:

- Price based on the net calculation excluding VAT
- Price based on the gross calculation excluding VAT

(Cf. MUG Rule 7 - Negative amounts with adjustments for ZUGFeRD with regard to commercial credit notes)

5.4.4 Negative amounts

Amounts in invoices may be negative with the exception that Amount due for payment must not be negative when payment means is bank transfer. This means that the due payable amount may also be negative provided that "Transfer" is not specified as the payment method. Otherwise if "Transfer" is specified as the payment method, this may lead to errors in the controlling of the recipient's payment system).

Net price should not be negative and negative invoice lines should be created by using negative quantity.

Validation rules

- IF Payment means type represents bank transfers (codes 31 or 42) THEN Amount due for Payment MUST NOT be less than zero (0.00)

(Cf. MUG Rule 7 - Negative amounts)

The following amounts must NOT be negative in an INVOICE:

(Handling commercial CREDIT NOTES is explained further below.)

- Charge amount at document level
- Allowance amount at document level
- VAT category taxable amount (Tax base amount per VAT rate/category)
- VAT total amount (Total tax amount) ()
- Invoice line net amount
- Sum of line amounts
- Sum of Allowance on document level Sum of Charges on document level Invoice total without VAT (Invoice total amount excluding VAT)
- Invoice total with VAT (Grand total amount (gross amount including VAT))
- Paid amounts (Total prepaid amount)
- Amount due for payment (Due payable amount) except if the prepaid amount is greater than the invoice total amount, for example
- Invoice line item net price (Price based on the net calculation excluding VAT)
- Invoice line item price discount/charge (Amount of the charge/allowance on the price)Invoice line item gross price (Price based on the gross calculation excluding VAT)

Note:

These validation rules apply exclusively to invoices which include only positive items. If an invoice contains negative items (e.g. for the refund of deposits), the amounts may be negative where necessary.

(Cf. MUG Rule 6 - Invoice currency/Negative amounts with adjustments for ZUGFeRD)

5.4.5 Rules for processing deposits

A distinction is drawn between two types of deposit. The first is on packaging material (e.g. beer bottles). In this case, the deposit appears on the invoice and when the deposit is refunded, negative items are shown on this invoice. In certain cases, this may lead to negative invoice totals.

The second is on transportation equipment (e.g. pallets, resuable transport containers). When products are sold, this equipment may also be shown in the invoice at item level. When it is returned, however, a separate receipt should be created (as the invoice for the original buyer or in the self-billing procedure if the original seller issues the receipt).

In ZUGFeRD, the type of deposit can be specified in the Extended profile in the product characteristics.

5.5 Content check

Statutory requirements mean that an enterprise must ensure the **authenticity and integrity** of an invoice. In other words, it must ensure that the invoice is "correct" and not an "amended/manipulated" invoice. For the enterprise's own commercial interest in particular, a procedure corresponding to an internal control procedure should ensure that the invoice is correct prior to making any payment instruction. Such internal control procedures are supported by ZUGFeRD.

In addition to the completeness and the accuracy of invoice data pursuant to Sections 14, 14a of the Value Added Act (see previous sections), it is important to ensure that the **contents of the invoice are correct**:

- correct goods or services supplied
- correct taxable person
- correct customer
- correct amounts
- correct payee (account details)

These checks justify the assumption that the requirements pertaining to the invoice in terms of the authenticity of its origin or the integrity of its content are met. If these checks are not carried out, there is no guarantee that the invoice is correct and that the input tax deduction can be granted.

Standard questions that are asked as part of this checking process include:

1. Is the seller/service provider known?
2. Is the account stated the same as that of my seller/service provider?
3. Were the goods or services that were invoiced actually received?
4. Are the prices in the invoice the same as the prices actually agreed?

1436 **5.5.1   Identifying the trading partner**

1437 The first step in verifying the authenticity of the invoice is to check the seller's identity.

1438 To **identify the seller (supplier)**, the invoice should therefore include the following:

Seller's name and address	Grouping of trade agreement information > Details of the seller > Seller's (company) name and details of the seller's address
Tax number or VAT ID number of the tax-able person	Grouping of trade agreement information > Details of the seller's tax information - Seller's tax number - Seller's VAT ID number
Payee's bank account (IBAN, BIC)	Grouping of settlement information > Details of the payment means > Seller's account number and bank
Identification numbers customary to an industry (e.g. GLN)	Grouping of trade agreement information > Details of the seller > Seller's global identifier

```
Example of a seller's master data with GLN:

<ram:SellerTradeParty>
   <ram:ID>549910</ram:ID>
   <ram:GlobalID schemeID="0088">4000001000005</ram:GlobalID>
   <ram:Name>MUSTERLIEFERANT GMBH</ram:Name>
   <ram:PostalTradeAddress>
      <ram:PostcodeCode>99199</ram:PostcodeCode>
      <ram:LineOne>BAHNHOFSTRASSE 99</ram:LineOne>
      <ram:CityName>MUSTERHAUSEN</ram:CityName>
      <ram:CountryID>DE</ram:CountryID>
   </ram:PostalTradeAddress>
   <ram:SpecifiedTaxRegistration>
      <ram:ID schemeID="VA">DE123456789</ram:ID>
   </ram:SpecifiedTaxRegistration>
</ram:SellerTradeParty>
```

1439 *Example 26: Specifying a seller's master data with GLN*

1440

```
Example of a bank account:

<ram:SpecifiedTradeSettlementPaymentMeans>
   <ram:PayeePartyCreditorFinancialAccount>
      <ram:IBANID>DE21860000000086001055</ram:IBANID>
      <ram:AccountName>Bundeskasse Halle -Loan-</ram:AccountName>
   </ram:PayeePartyCreditorFinancialAccount>
   <ram:PayeeSpecifiedCreditorFinancialInstitution>
      <ram:BICID>MARKDEF1860</ram:BICID>
                  <ram:Name>Deutsche Bundesbank -Leipzig branch-</ram:Name>
   </ram:PayeeSpecifiedCreditorFinancialInstitution>
</ram:SpecifiedTradeSettlementPaymentMeans>
```

1441   *Example 27: Specifying a bank account*

1442   Specifying standardised data such as the VAT identification number, GLN or IBAN are particularly helpful
1443   when carrying out an automated comparison with the master data available in the enterprise. Differences
1444   between the saved master data and the transmitted invoice data would then lead to a further check which
1445   in turn should result in the master data or the invoice being corrected.

5.5.2   References in the logistics chain

1446

1447   The second step in ensuring the authenticity and integrity of the invoice is the **factual-material check**, i.e.
1448   the invoice is examined to see whether it is factually correct and plausible.

1449   As part of this check, the quantities of goods or services that are invoiced must be compared with those
1450   goods or services actually supplied (through a comparison against the delivery note, order or the contract)
1451   and the prices included on the invoice must be compared with the prices agreed (through a comparison
1452   against the order or the offer).

1453   Details included on the invoice which allow it to be compared with records of the goods and services sup-
1454   plied, orders, contracts or agreements are helpful for this purpose. In addition, an agreed customer refer-
1455   ence can also be stated. Such information can be stated in ZUGFeRD as an option. For information on
1456   stating payment references, see section 5.6.5.

1457

Delivery note numbers	Grouping of delivery information > Details of the accompanying delivery note > Delivery note number
Order numbers	Grouping of trade agreement information > Details of the accompanying order > Order number
Contract numbers	Grouping of trade agreement information > Details of the accompanying contract > Contract number
Customer reference	Grouping of trade agreement information > Buyer reference

```
Example of order reference, delivery note reference and other references:
(possible from the Comfort profile upwards)

<ram:BuyerOrderReferencedDocument>
   <ram:IssueDateTime>2013-08-01T00:00:00</ram:IssueDateTime>
   <ram:ID>B123456789</ram:ID>
</ram:BuyerOrderReferencedDocument>


<ram:DeliveryNoteReferencedDocument>
   <ram:IssueDateTime>2013-08-05T00:00:00</ram:IssueDateTime>
   <ram:ID>L87654321012345</ram:ID>
</ram:DeliveryNoteReferencedDocument>


<ram:ContractReferencedDocument>
   <ram:IssueDateTime>2013-08-02T00:00:00</ram:IssueDateTime>
   <ram:ID>ANG471123</ram:ID>
</ram:ContractReferencedDocument>


<ram:BuyerReference>S2005-111</ram:ContractReferencedDocument>
```

1458 *Example 28: Specifying document references*

1459 A **fully-automated content check** is therefore only carried out if the upstream procedural steps of "Order",

1460 "Delivery and Receipt of Goods" are performed electronically and all of the information relevant to the check is

1461 available in standardised, structured form. However, exceptions apart, this check is likely to be reserved mostly

1462 for larger enterprises and, at present, is not yet of any significant importance for micro and small enterprises.

1463

1464 **5.5.3 Product/service information**

1465 The following product or service information may be provided for individual invoice items:

1466   •   Manufacturer's article number

1467   •   Customer article number

1468   •   Global article number (in accordance with ISO 6523 e.g. GTIN, formerly EAN)

1469   •   Article name

1470   •   Article description

1471   •   Country of origin

1472   •   Product classification (see below)

1473   •   Sublineitems (see below)

1474   •   Product characteristics (see below)

1475

1476
1477 Example:
1478

```
1479 <ram:SpecifiedTradeProduct>
1480     <ram:GlobalID schemeID="0160">4123456000014</ram:GlobalID>
1481     <ram:SellerAssignedID>ZS997</ram:SellerAssignedID>
1482     <ram:Name>Citric acid 100ml</ram:Name>
1483 </ram:SpecifiedTradeProduct>
```
1484

1485 *Example 29: Product and service details*

1486

5.5.4 Product categories

In addition to the name of the article, a product group or product category can also be included on the invoice, making it easier to automatically assign the incoming invoice to an account.

Product category (classification)	Grouping of information on the product or on the service provided > Details of the product classification > Classification of the product (code)
Product category (free text)	Grouping of information on the product or on the service provided > Details of the product classification > Classification of the product (free text)
Product classification name (coded)	Grouping of information on the product or on the service provided > Details of the product classification > Product classification name

Figure 12: Depiction of product categories

```
Example:
<ram:DesignatedProductClassification>
        <ram:ClassCode listID="GPC" listVersionID="01/06/2013 DE">10000278
        </ram:ClassCode>
        <ram:ClassName>Yoghurt/Yoghurt Substitutes (Perishable)</ram:ClassName>
</ram:DesignatedProductClassification>
```

Example 30: Depiction of product categories

The following are some of the classification standards supported by ZUGFeRD:

- eCl@ss
- GPC (Global Product Classification)
- UNSPSC
- CPV

It is also possible to specify a product category which is predefined by the customer or decided by the seller.

Classifications can only be specified in structured form in the Extended profile. In the Basic and Comfort profiles, these can be specified as free text when needed.

1511 ### 5.5.5 Specifying additional product characteristics

1512 In ZUGFeRD, additional product characteristics can also be mapped in structured form in the Extended

1513 profile. This is done by specifying not only the characteristic, both in coded form and at the same time as

1514 text, but also the accompanying value or measured quantity. Measured quantities are always specified as

1515 units of measurement.

1516

1517 <u>Colour: RAL 3003</u>

1518 Type of product characteristic (code):   COLOR_CODE

1519 Type of product characteristic (free text):   Colour code

1520 Value of the product characteristic (text):   RAL 3003

1521 <u>Length: 3 metres</u>

1522 Type of product characteristic (code):   LENGTH

1523 Type of product characteristic (free text):   Length

1524 Value of the product characteristic (numerical measured quantity):   3

1525 Unit of measurement: MTR

1526

1527 The product characteristics defined in ZUGFeRD and the accompanying codes can be found in the

1528 ZUGFeRD code lists in the appendix.

1529

1530
1531
1532
1533
1534
1535
1536
1537
```
Example:

<ram:ApplicableProductCharacteristic>
        <ram:TypeCode>PACKAGING_MATERIAL</ram:TypeCode>
        <ram:Description>Packaging material</ram:Description>
        <ram:Value>Cardboard</ram:Value>
</ram:ApplicableProductCharacteristic>
```

1538 *Example 31: Specifying product characteristics*

1539

1540 **5.5.6 Display of subline-items**

1541 Subline-items can be displayed in the Extended profile in ZUGFeRD. The following information can be pro-

1542 vided on the subline-item level:

1543 • Manufacturer's article number

1544 • Customer article number

1545 • Global article number (in accordance with ISO 6523 e.g. GTIN, formerly EAN)

1546 • Article name

1547 • Article description

1548 • Quantity (quantity of the subline-item (e.g. 10 umbrellas) in the main item (e.g. cardboard box))

1549

5.6 Payment

There are more and more ways of making payments. Besides the usual methods of money transfer and direct debit, credit card billing and alternative payment service providers are becoming increasingly important, especially in online trading.

The definition of ZUGFeRD covers the following payment options, which can be specified in the means of payment:

- transfer
- direct debit
- cash transactions and payments via credit card or other payment instruments

If the payment is initiated by the invoicee, the automated choice of the ideal time for payment can create value added for the enterprise. This requires not only the due payable amount, but also the payment terms (i.e. due dates and, if applicable, discounts or penalties) to be specified in the invoice.

ZUGFeRD takes account of special requirements for processing prepayments, advance payments or partial payments, including the mapping of partial payment plans with several payment times.

In the case of prepayments, a difference arises between the invoice amount and the due payable amount. This difference can be shown in ZUGFeRD. For prepayments, advance payments or partial payments, the prepayments received must be listed in the final invoice (cf. calculation matrix).

Invoice amount	Grouping of settlement information > Monetary summation > Invoice Total amount (Grand total amount)
Prepayments	Grouping of settlement information > Monetary summation > Total prepaid amount (Paid amount)
Due payable amount	Grouping of settlement information > Monetary summation > Due payable amount (Amount due for payment)

```
Example of invoice total amounts with a prepayment:
<ram:SpecifiedTradeSettlementMonetarySummation>
    …
    <ram:GrandTotalAmount currencyID="EUR">518.99</ram:GrandTotalAmount>
    <ram:TotalPrepaidAmount currencyID="EUR">100.00</ram:TotalPrepaidAmount>
    <ram:DuePayableAmount currencyID="EUR">418.99</ram:DuePayableAmount>
</ram:SpecifiedTradeSettlementMonetarySummation>
```

Example 32: Display of prepayments

1569 Note:

1570 Prepayments are shown excluding VAT and only reduce the due payable amount. If the seller fails to in-

1571 clude the received prepayments in the final invoice or only shows these only as a gross amount, the VAT

1572 included in the invoice must be repaid to the tax office.

1573 In contrast to the CEN MUG recommendation, the due payable amount may also be negative, for example

1574 if the total prepaid amount is greater than the invoice amount.

1575

1576 As a basic principle, the due payable amount is given the status "Dependent", i.e. it is only specified if it

1577 differs from the invoice amount and this is to be shown on the invoice. This means that whenever the total

1578 prepaid amount is specified, the due payable amount must also be included.

1579 In addition, the due payable amount must always be specified if details of the means of payment are pro-

1580 vided. For example, if "Transfer" is selected as the payment means, the due payable amount must be given

1581 so as to provide support to payment applications in particular. In the area of B2C, this also makes matters

1582 easier for the invoicee. The account and payment reference may be applied to the respective application

1583 without any error occurring.

1584 In accounting terms, the invoice amount reflects the amount receivable in the invoice, whereas the due

1585 payable amount is the amount due.

1586 Example scenarios where the due payable amount is used for various payment means:

1587 *Invoice*

Payment means	Code	Invoice amount	Total prepaid amount	Due payable amount	Comment
Transfer	31/42	100.00	0.00	100.00	Due payable amount = transfer amount
Direct debit	49	100.00	0.00	100.00	Due payable amount = amount to be collected
Payment via credit card	48	100.00	100.00	0.00	Due payable amount = 0, as no action required on the part of the invoice
Payment in cash	10	100.00	100.00	0.00	Due payable amount = 0, as no action required on the part of the invoicee
Paid via an online payment system	3	100.00	100.00	0.00	Due payable amount = 0, no action required on the part of the invoicee
Clearing between parties	97	100.00	0.00	100.00	Due payable amount = amount cleared

1588 *Table 2: Specifying the due payable amount in an invoice*

Commercial credit note (corrected invoice/cancellation):

Scenario	Payment means	Invoice amount	Total pre-paid amount	Due paya-ble amount	Comment
Invoice already paid	Transfer, clearing, credit card, online payment sys-tem	-100.00	0.00	-100.00	Due payable amount = **negative** = amount transferred back to the invoicee = payment which I, as the invoicee, can expect to be made to this account, credit card account, etc.
Invoice unpaid	N/A	-100.00	0.00	0.00	Due payable amount = zero, no action required as regards payments

1590 *Table 3: Specifying the due payable amount in the case of a commercial credit note*

1591 The due payable amount on an invoice may also be negative if the total prepaid amount is higher than the

1592 invoice amount, for example, or if the deposit (for packaging material) returned is greater than the sum of

1593 the goods purchased.

1594 *Self-billing:*

Payment means	Invoice amount	Total prepaid amount	Due paya-ble amount	Comment
Transfer, clear-ing, etc.	100.00	0.00	100.00	Due payable amount = amount which I, as the taxable person, can expect based on the transmitted document, with the ac-companying payment method.

1595 *Table 4: Specifying the due payable amount in the case of a credit note (self-billing)*

1596 5.6.1 Payment terms

1597 Payment terms are shown in ZUGFeRD under "Details of payment terms" (SpecifiedTradePaymentTerms).

1598 In the Basic profile, payment terms are specified as free text at document level, e.g. "Payable immediately,

1599 without any deduction" or "2.0% discount granted on payments made within 10 days".

1600 From the Comfort profile upwards, the payment terms are indicated as free text in the field marked "Pay-

1601 ment Terms Description Text", together with the due date, in structured form.

1602 The Extended profile provides further opportunities for the structured presentation of payment terms, for

1603 example discounts, late payment penalties or the presentation of partial payments. It should be noted

1604 that the entire group is repeated for each payment term listed. This means that if the due date is shown

1605 and a discount is also offered, the group is listed twice in the XML structure.

1606

Payment terms with due date(s) or discount (if applicable, penalties)	Grouping of settlement information > Details of payment terms

Examples of payment terms:

Due date: 25 June 2014 (= invoice date)

2% discount if payment made within 10 days

Basic profile:

```
<ram:IncludedNote>
    <ram:Content>Payable immediately, without any deduction. 2.0% discount
granted on payments made within 10 days.</ram:Content>
</ram:IncludedNote>
```


Comfort profile:

```
<ram:SpecifiedTradePaymentTerms>
    <ram:Description>Payable immediately, without any deduction. 2.0% dis-
count granted on payments made within 10 days.</ram:Description>
    <ram:DueDateDateTime>
        <udt:DateTimeString format="102">20140625</udt:DateTimeString>
    </ram:DueDateDateTime>
</ram:SpecifiedTradePaymentTerms>
```


Extended profile:

```
<ram:SpecifiedTradePaymentTerms>
    <ram:Description> Payable immediately, without any deduction.
    </ram:Description>
    <ram:DueDateDateTime>
        <udt:DateTimeString format="102">20140625</udt:DateTimeString>
    </ram:DueDateDateTime>
</ram:SpecifiedTradePaymentTerms>


<ram:SpecifiedTradePaymentTerms>
    <ram:Description>2.0% discount granted on payments made within 10
days.</ram:Description>
    <ram:ApplicableTradePaymentDiscountTerms>
        <ram:BasisPeriodMeasure unitCode="DAY">10
        </ram:BasisPeriodMeasure>
        <ram:CalculationPercent>2.00</ram:CalculationPercent>
    </ram:ApplicableTradePaymentDiscountTerms>
</ram:SpecifiedTradePaymentTerms>
```

```
Alternatively, discounts can be presented as follows if the due date, and not
the payment period, is to be shown:


<ram:SpecifiedTradePaymentTerms>

     <ram:Description>2.0% discount granted on payments made within 10
days.</ram:Description>

     <ram:DueDateDateTime>

       <udt:DateTimeString format="102">20140704</udt:DateTimeString>

     </ram:DueDateDateTime>

     <ram:ApplicableTradePaymentDiscountTerms>

       <ram:CalculationPercent>2.00</ram:CalculationPercent>

     </ram:ApplicableTradePaymentDiscountTerms>

   </ram:SpecifiedTradePaymentTerms>
```

1608   *Example 33: Specifying payment terms*

1609   Specifying the date from which the payment becomes due

1610   A different start date can be specified in the Extended profile when a discount is offered. Furthermore,

1611   where payment terms are negotiated in advance, only the date on which the payment starts to fall due

1612   may be specified.

1613

Payment terms with due date(s) or discount (if applicable, penalties)	Grouping of payment information > Details of payment terms

```
Example of payment terms:
Due date: 25 June 2014
2% discount if payment made within 10 days, starting from 01.07.2014


Extended profile:
Specifying a different start date for the discount


  <ram:SpecifiedTradePaymentTerms>
     <ram:Description>2.0% discount granted on payments made within 10 days,
starting from 01.07.2014.</ram:Description>
     <ram:ApplicableTradePaymentDiscountTerms>
        <ram:BasisDateTime>
           <udt:DateTimeString format="102">20140701</udt:DateTimeString>
        </ram:BasisDateTime>
        <ram:BasisPeriodMeasure unitCode="DAY">10
        </ram:BasisPeriodMeasure>
        <ram:CalculationPercent>2.00</ram:CalculationPercent>
     </ram:ApplicableTradePaymentDiscountTerms>
  </ram:SpecifiedTradePaymentTerms>



Example of payment terms:
Only specifying the date from which the payment becomes due: 01.07.2014


Extended profile:
Specifying a different start date for payment terms


  <ram:SpecifiedTradePaymentTerms>
     <ram:Description>Please note the different date from which the payment
becomes due.</ram:Description>
     <ram:ApplicableTradePaymentDiscountTerms>
        <ram:BasisDateTime>
           <udt:DateTimeString format="102">20140701</udt:DateTimeString>
        </ram:BasisDateTime>
     </ram:ApplicableTradePaymentDiscountTerms>
  </ram:SpecifiedTradePaymentTerms>
```

1614 *Example 34: Specifying a discount and penalties*

1615   Applying partial payments

1616   Partial payments or information on partial payments can be reproduced in the Extended profile in struc-

1617   tured form. In the Basic and Comfort profile, information is provided via the relevant free text fields. The

1618   total due payable amount is no longer shown here; instead the partial payments due are listed in the

1619   payment terms.

Partial payments	Grouping of payment information > Details of payment terms > Partial payment amount

```
Example of payment terms:
Invoice amount: EUR 1,000
Partial payments of EUR 500 on 01.07.2014 and EUR 500 on 01.10.2014


Extended profile:


  <ram:SpecifiedTradePaymentTerms>
    <ram:Description>1st partial payment of EUR 500 due on
01.07.2014</ram:Description>
    <ram:DueDateDateTime>
      <udt:DateTimeString format="102">20140701</udt:DateTimeString>
    </ram:DueDateDateTime>
    <PartialPaymentAmount currencyID="EUR">500</PartialPaymentAmount>
  </ram:SpecifiedTradePaymentTerms>


  <ram:SpecifiedTradePaymentTerms>
    <ram:Description>2nd partial payment of EUR 500 due on
01.10.2014</ram:Description>
    <ram:DueDateDateTime>
      <udt:DateTimeString format="102">20141004</udt:DateTimeString>
    </ram:DueDateDateTime>
    <PartialPaymentAmount currencyID="EUR">500</PartialPaymentAmount>
  </ram:SpecifiedTradePaymentTerms>
```

1620   *Example 35: Specifying partial payment agreements*

1621   Applying a early payment discount as a rebate

1622   Besides the possibility of listing a early payment discount as a payment term, ZUGFeRD also gives the user

1623   the opportunity to present a discount as a deduction at document level.

| 1624 | **5.6.2 Payment means** |

1625 Two specific features should be noted if details of the payment means are specified in the core invoice.

1626 Code "31" denotes a SEPA credit transfer as being a possible payment means. In this case, the taxable per-

1627 son's/payee's IBAN and BIC must be included and must be used by the customer/payer.

1628 ***In accordance with general requirements by financial institutions, an invoice should never include a full card***

1629 ***number but only the last 4 to 6 digits. Validation rules***

1630 • If Payment means type is "31" then schema for Account identifier SHOULD beIBAN AND schema
1631 Financial Institution identifier SHOULD be BIC.

1632 • If Payment means type is Credit/Bank card "48" then MAXIMUM length for Account identifier is 6
1633 digits.

1634 If "Transfer" is used as the payment means, the taxable person's/payee's bank account as well as the due

1635 payable amount must always be specified. This also facilitates the integration of ZUGFeRD into automated

1636 forms of payment (online banking, electronic bill presentment and payment (EBPP)).

1637 The codes for the different payment means can be found in the code lists in the appendix.

1638 Until the switch to SEPA as a means of making transfers nationally is complete, payments made using the

1639 account number and bank sort code are identified by code "42".

1640 (Cf. MUG Rule 10 – Payment means with additions and amendments for ZUGFeRD)

1641

Payment means	Grouping of payment information > Details of the payment means > Payment type

```
Example of a "SEPA credit transfer" as the payment means:


<ram:SpecifiedTradeSettlementPaymentMeans>

     <ram:TypeCode>31</ram:TypeCode>

…

</ram:SpecifiedTradeSettlementPaymentMeans>
```

1642 *Example 36: Specifying the payment means*

1643

1644   **5.6.3   Transfer**

1645   SEPA (Single Euro Payments Area) standardised euro transfers and direct debits across Europe on 1 Febru-

1646   ary 2014. As a result of SEPA, the German national account number and German national bank code num-

1647   ber (BLZ) are no longer used when making transfers and are instead replaced by the IBAN and BIC. Since 1

1648   February 2014, the BIC is no longer mandatory for domestic payments. With effect from 1 February 2016,

1649   this requirement shall also apply to cross-border payments within the SEPA area. It is common to include

1650   the name of the beneficiary.

1651   In order to establish a clear link between the amount receivable, the transfer and the resulting Value Add-

1652   ed on the account, the beneficiary can also specify a reference number. This reference number, which is

1653   shown on the invoice as the "Payment reference", must be entered on the SEPA credit transfer form in

1654   the "Customer reference number" field. This guarantees that the reference number is transmitted in a

1655   structured data field when making a SEPA payment, and not in unstructured remittance information. In

1656   the technical specifications on SEPA payments, this reference number is called the "End-to-End Refer-

1657   ence".

1658

Beneficiary: surname, first name/company (maximum of 70 characters)	Grouping of trade agreement information > Buyer's (company) name
IBAN of the beneficiary	Details of the payment means > Seller's account number > IBAN (must be transmitted as a structured field WITHOUT spaces)
BIC of the beneficiary's financial institution	Details of the payment means > Seller's financial institution > BIC
Customer reference number	Grouping of settlement information > Payment reference

```
Example of a transfer as a payment means and payment terms:

<ram:ApplicableSupplyChainTradeSettlement>
..
   <ram:PaymentReference>Fine 552xxxxx</ram:PaymentReference>
   <ram:InvoiceCurrencyCode>EUR</ram:InvoiceCurrencyCode>

   <ram:SpecifiedTradeSettlementPaymentMeans>
     <ram:TypeCode>31</ram:TypeCode>
     <ram:Information>via transfer</ram:Information>
     <ram:PayeePartyCreditorFinancialAccount>
             <ram:IBANID>DE21860000000086001055</ram:IBANID>
             <ram:AccountName>Bundeskasse Halle -loan-</ram:AccountName>
     </ram:PayeePartyCreditorFinancialAccount>
     <ram:PayeeSpecifiedCreditorFinancialInstitution>
             <ram:BICID>MARKDEF1860</ram:BICID>
                         <ram:Name>Deutsche Bundesbank –Leipzig branch-</ram:Name>
     </ram:PayeeSpecifiedCreditorFinancialInstitution>
   </ram:SpecifiedTradeSettlementPaymentMeans>
..
</ram:ApplicableSupplyChainTradeSettlement>
```

1659   *Example 37: Specifying a SEPA credit transfer*

5.6.4 Direct debit procedure

Unlike the nationally used direct debit procedure the creditor identifier (unique identifier of the payee/seller) and the mandate reference (unique identifier assigned by the payee for referencing the direct debit mandate) must be specified in the SEPA direct debit. The payer's bank account is also an integral component of the direct debit mandate. A direct debit is initiated by the payee, independently of the sending of the invoice. In this respect, the invoice is not used to initiate the payment transaction, as is the case when making a SEPA credit transfer.

However, under the SEPA direct debit, pre-notification must be sent to the payer within a certain time limit prior to the payment being carried out. This pre-notification includes the direct debit amount and the due date as well as the creditor identifier and the mandate reference. This data is used for information purposes only and, as a rule, is not automatically analysed and or processed further by the payer.

The SEPA payment does not stipulate how the pre-notification should be sent. The pre-notification can therefore be integrated into the invoicing process. A separate process is not required.

Consequently, where transactions are carried out using direct debits, the following requirements resulting from the SEPA procedure pertain to ZUGFeRD invoices.

Mandate reference	Grouping of settlement information > Details of payment means > Mandate reference
Creditor identifier[9]	Grouping of settlement information > Details of payment means > Creditor ID
Direct debit amount	Grouping of settlement information > Details of document totals > Due payable amount
Due date	Grouping of settlement information > Details of payment terms > Due date

```
Example of a SEPA direct debit specifying the mandate reference and the creditor ID:


<ram:ApplicableSupplyChainTradeSettlement>

..

   <ram:PaymentReference>Invoice number 4711/2014</ram:PaymentReference>

   <ram:InvoiceCurrencyCode>EUR</ram:InvoiceCurrencyCode>


   <ram:SpecifiedTradeSettlementPaymentMeans>

     <ram:TypeCode>49</ram:TypeCode>

     <ram:Information>Amount is collected via SEPA direct debit</ram:Information>

     <ram:ID schemeAgencyID="DE98ZZZ09999999999">REF A-123</ram:ID>

     <ram:PayerPartyDebtorFinancialAccount>

             <ram:IBANID>DE21860000000086001055</ram:IBANID>

             <ram:AccountName>Bundeskasse Halle -loan-</ram:AccountName>

     </ram:PayerPartyDebtorFinancialAccount>

     <ram:PayerSpecifiedDebtorFinancialInstitution>

             <ram:BICID>MARKDEF1860</ram:BICID>

                      <ram:Name>Deutsche Bundesbank -Leipzig branch-</ram:Name>

     </ram:PayerSpecifiedDebtorFinancialInstitution>

   </ram:SpecifiedTradeSettlementPaymentMeans>

..

</ram:ApplicableSupplyChainTradeSettlement>
```

1676 *Example 38: Specifying SEPA direct debits with pre-notification*

1677 The due date of a ZUGFeRD invoice is assumed to match the due date of the direct debit. If a payer's ac-

1678 count is to be debited on a due date which is different to that of the invoice, this must be regulated in

1679 separate contract terms between the payee and payer. In this case, pre-notification must be sent using an

1680 alternative method.

---

[9] The creditor ID is interpreted as a scheme agency ID, since the creditor is the issuer of its mandate references. The mandate reference is therefore an identification number issued by this scheme (creditor ID).

1681 **5.6.5   Cash transaction and payment by credit card or other payment instruments**

1682 The ZUGFeRD format supports SEPA credit transfer initiation. If payment instruments such as credit cards

1683 or other online payment methods are used, these must be initiated by the payee via a different process.

1684 However, the respective amounts paid using different payment instruments (e.g. cash payment in ad-

1685 vance) can be specified. As a general rule, the prepayments made using the payment instrument are iden-

1686 tical to the invoice amount and the due payable amount is therefore zero.

1687 The payment reference (e.g. transaction number) can be used to establish a link between the payment

1688 and the invoice. The reference helps the invoicer to assign an incoming payment to the relevant payment

1689 process. When specifying a payment reference, the receiving system should therefore indicate this when

1690 executing the payment (keyword remittance information).

1691

Payment reference	Grouping of payment information > Payment refer-ence

Example of a payment reference:
Paid by a payment service provider, transaction code **51T107439Y074156A**
 	
`<ram:ApplicableSupplyChainTradeSettlement>`
   `<ram:PaymentReference>`**51T107439Y074156A**`</ram:PaymentReference>`
`..`
`<ram:SpecifiedTradeSettlementPaymentMeans>`
     `<ram:TypeCode>`**3**`</ram:TypeCode>`
     `<ram:Information>`**Paid by a payment service provider XY**`</ram:Information>`
 	
   `..`
`</ram:ApplicableSupplyChainTradeSettlement>`	

1692 *Example 39: Cash transactions and payment service transactions*

1693

5.7   Posting to accounts

There are a number of different methods as to how, and at what point in the processing of incoming in-voices, the invoices are posted for accounting purposes. The method used is determined by statutory requirements and the desired performance features of the accounting system.

5.7.1   Invoice is not posted

In the most straightforward case – e.g. small enterprises (Section 19 of the Value Added Tax Act) and members of the liberal professions (Section 4 (3) of the Income Tax Act – (*Einkommensteuergesetz – EstG*)) the invoice is, where applicable, not posted during the year at all; instead, only the **payment is posted**. In such cases, it is helpful if a reference to the invoice and to the expenditure that is to be posted can be created when making the payment.

Increasing automation of the account posting process – which is supported by ZUGFeRD – will also make the introduction of accounts receivable and accounts payable accounting possible for micro and small enterprises, as this can be implemented efficiently. This will considerably increase the value of accounting for micro and small enterprises as a current and effective management tool. If invoices are also posted promptly during the year, the accounting process can provide information, inter alia, on

- Outstanding items (which invoices are still to be paid?)
- Recommendations on ideal payment times as well as
- Liquidity forecast.

5.7.2   Posting of invoices based on VAT rates

In most cases, the invoice is posted primarily for the purposes of calculating VAT as well as for retrospec-tively evaluating the success of a company.

If **different rates of VAT** are shown on an invoice, these must also be entered separately in the accounts. The resulting requirements correspond to those under the check carried out pursuant to Section 14 of the Value Added Tax Act and do not therefore need to be set out in detail once more.

The question of **account assignment for invoices**, i.e. to which expense/revenue account, or which as-set/liability account an invoice is posted, depends on many factors: What sector does the enterprise be-long to? Which system of accounts is used? In what level of detail should these items be differentiated?

Given that the seller generally does not know, to which of the invoicee's accounts the invoice should be assigned (franchised businesses are an example of an exception), this must be identified in other ways in order to increase the level of automation.

1726 In the most straightforward case, invoices are assigned to an account by **identifying the business partner**
1727 (e.g. "A telephone invoice is posted to telecommunications costs"). Identifying the (expenses) account to
1728 which an invoice is to be posted, using the business partner's characteristics (VAT identification number,
1729 bank account, address), is generally carried out automatically on the basis of rules. Legal requirements
1730 mean that the requisite fields exist as a rule and must therefore no longer be explicitly designated.

1731 ### 5.7.3 Posting of invoices based on product categories

1732 Account assignment above and beyond established rules can also be applied even if the posting of invoic-
1733 es can be differentiated **by product category**.

1734 ### 5.7.4 Posting of invoices at item level

1735 As a rule, efficient posting of each individual invoice item only occurs if procurement takes place via an
1736 inventory control system and if each procured article is also assigned to a corresponding account. Accord-
1737 ingly, the account to which an invoice is allocated can be identified based on the article number.

1738 For this purpose, both the seller's article number and the internal article number must be updated in the
1739 inventory control system. The use of globally unique article numbers (e.g. GTIN, formally EAN) is more
1740 efficient.

1741 ### 5.7.5 Posting invoices to cost centres

1742 The larger the enterprise, the greater is the need for cost accounting in addition to general ledger and
1743 subledger accounting. In this way, it is possible to exercise control not only at the level of the enterprise as
1744 a whole, but also at the more detailed level of individual organisational units/cost centres. In larger enter-
1745 prises in particular, the cost centre is relevant for identifying whoever is able to carry out the technical
1746 check of the invoice.

Cost centre	Grouping of settlement information > Details of booking reference

```
Example:
   <ram:ApplicableSupplyChainTradeSettlement>
      <ram:ReceivableSpecifiedTradeAccountingAccount>
            <ram:ID>T10001</ram:ID>
      </ram:ReceivableSpecifiedTradeAccountingAccount>
   </ram:ApplicableSupplyChainTradeSettlement>
```

1747 *Example 40: Specifying cost centres*

1748

5.8   Special requirements in public administration

ZUGFeRD is an invoice data standard developed jointly by the private sector and public administration. The special requirements of public administration were therefore taken into consideration.

Typically, there are three points where specific features apply to public administration from a budgetary and cost accounting perspective:

1. When generating orders for goods and services, an **order or transaction number** is created and passed on to the seller. During invoicing, this number must be supplied as a reference number within the invoice as it is essential not only for assigning the invoice and order but also for carrying out the incoming goods inspection.

2. The budgetary funds are usually fixed for all procurement measures over a defined sum, i.e. within cameralistic budgeting, the anticipated invoice amounts for procurements are restricted to the expenditure item. In such cases, a **specification number** is generated which must be used as a reference document number when paying the invoice in order to settle the invoice amount from the fixed budget funds. This allows all single-entry and double-entry accounting to be mapped in the ERP system, which greatly reduces time entering data following receipt of the invoice. As a result, especially when combined with the reference number (order or transaction number) stated under point 1, invoices can be processed completely electronically. In this regard, the specification number may by all means be identical to the order number. The specification number is mapped in ZUGFeRD via the payment reference.

3. Public administration increasingly also operates a system of performance and cost accounting. This means that all business transactions are posted to the respective **cost centres**. This is also very important for asset accounting.

For outgoing invoices and notifications from public administration (e.g. notifications of charges), it is usual when making the payment to indicate a payment number so that it can be assigned to the underlying transaction. With regards to payment numbers, depending on the transaction, a transaction reference or something similar can be used within the administration as an assignment criterion. In ZUGFeRD, this can also be mapped via the payment reference.

Order number/transaction number	Grouping of trade agreement information > Details of the accompanying order > Order number
Specification number	Grouping of settlement information > Payment reference
Payment number	Grouping of settlement information > Payment reference
Cost centre	Grouping of settlement information > Details of the booking reference
Different ship-to-party	Grouping of delivery information > Details of the different ship-to-party

1776   *Example 41: Information for the public administration*

1777   Since there is an increasing focus on the centralisation of procurement, especially in the public sector, it is

1778   standard practice for a large order to be placed centrally, wherever this is possible, and then for the order

1779   to be distributed to a number of different delivery addresses. The primary benefit of this is that minimum

1780   quantity surcharges no longer apply and, where appropriate, discounts can be claimed on larger quanti-

1781   ties.

1782   It is therefore necessary that **several different ship-to-parties** can also be reproduced. The same applies

1783   to incoming goods at the respective delivery address. Different ship-to-parties can therefore be mapped at

1784   document and item level.

1785

1786 ## 5.9 Mapping to the data model

1787 The contents described above are defined as elements/attributes of the ZUGFeRD data model. The full

1788 description is published as per the appendix to this specification.

1789 Wherever inclusion on the ZUGFeRD invoice is required is specified for each element/attribute. Depending

1790 on the type of ZUGFeRD profile (see chapter 3), the respective data must be stored in structured fields, or

1791 otherwise in a free text field.

1792

1793 The following status displays are used in the ZUGFeRD data model:

R	REQUIRED	Indicates that the use of this element is required; the element must be used.
A	ADVISED	Indicates that the use of this element is advised.
D	DEPENDENT	Indicates that the use of this element depends on certain conditions which are described in corresponding notes. An element/attribute which is marked as "Dependent" must always be specified if the requirements in the respective process have been met. For example, information regarding an exemption from tax must be specified if the invoice relates to an intra-Community supply. In contrast, this information is not required for a supply within an EU Member State.
O	OPTIONAL	Indicates that the use of this element is optional and is at the discretion of the user. An element/attribute which is marked as "Optional" can be populated depending on the respective business process.
N	NOT USED	Due to the methodology used when generating the ZUGFeRD syntax, the schema contains elements which are not used in the ZUGFeRD standard. These fields must not be populated during implementation.

1794 *Figure 13: Status information in the ZUGFeRD data model and schema*

1795

6 Technical implementation of XML and syntax

1796

6.1 ZUGFeRD syntax structure

1797

1798 The UN/CEFACT Cross Industry Invoice is one of several UN/CEFACT messages which allows data to be
1799 exchanged between different industries and different countries. Examples of other messages besides the
1800 Cross Industry Invoice (CII) are the Cross Industry Order (CIO) or the Cross Industry Despatch Advice (CIDD)
1801 message. All are based on the Core Component Library (CCL), which defines the document-specific types
1802 of data for the respective message. Underlying these are general component classes which are given doc-
1803 ument-specific names when defining the message. For example, there is a basic data type for displaying
1804 the underlying counterparty in a business transaction (ApplicableSupplyChainTradeAgreement). By focus-
1805 ing on individual documents indicators are added for each case. The name in an invoice message then
1806 changes to Applicable**CII**HSupplyChainTradeAgreement, for an order to Applicable**CIO**HSupplyChainTra-
1807 deAgreement and for the despatch advice to Applicable**CIDD**HSupplyChainTradeAgreement. The CCL, on
1808 the other hand, is derived using the Core Component Specification (CCS, ISO 15000-5:2014). This describes
1809 the requirements made of the individual data structures, such as which information is used to describe a
1810 business partner (name, address, tax number, etc.).

1811 In order to simplify mapping in future, FeRD decided to base the ZUGFeRD data model directly on the
1812 CCL. At the semantic model level, a data model is created which is defined as being more straightfor-
1813 ward and CII-compatible. In order to produce XML schemas from the semantic data model, the Nam-
1814 ing and Design Rules (NDR) are applied. Using these rules, XML data types are created from the se-
1815 mantic definitions.

1816 The ZUGFeRD data model is created using the rules of the UN/CEFACT Cross Industry Invoice data model.
1817 Unlike the standard, these rules are applied directly to the underlying components of the UN/CEFACT Core
1818 Component Library based on ISO 15000-5:2014. Up to this point, the resulting semantic ZUGFeRD data
1819 model is syntax-independent. This very extensive data model is restricted in line with the ZUGFeRD re-
1820 quirements which correspond largely to the requirements of the MUG project (CEN CWA 16356) (profile
1821 creation). In the final stage, the UN/CEFACT Naming and Design Rules (NDR)[10] are applied, resulting in the
1822 creation of the final ZUGFeRD XML schemas.

---

[10] In contrast to the NDR 2.1, no code lists are adopted when generating the schema.
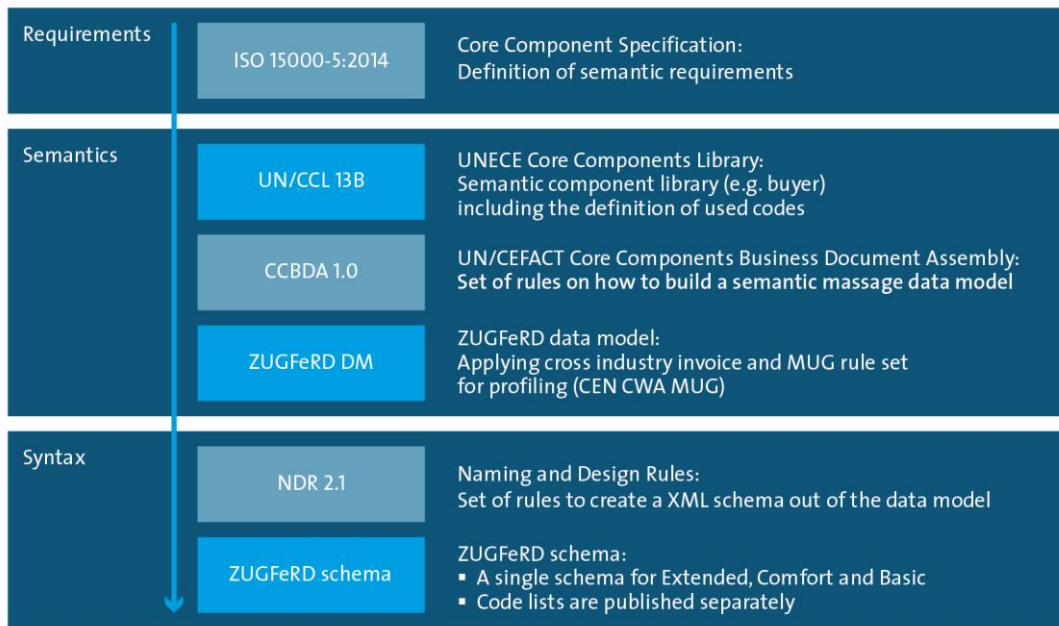
1823

1824   *Figure 14: International standards as the basis of the ZUGFeRD format*

1825   ## 6.2   Rules and tips for XML implementation

1826   UTF-8 is the only encoding used.

1827   In decimal figures, decimal places are separated by a decimal point.

1828   Specifying an `xsi:schemaLocation` attribute in the instance file should be avoided, as the receiving sys-
1829   tem's folder structure is generally unknown to the sender. The receiving system can carry out validation
1830   even without this attribute being specified.

1831   The CCL has been developed based on the Venetian Blind design principle (global types, local elements).
1832   As an example, the data type for references to other documents is to shown below. In this data type the
1833   number and date of the document and the type of referenced document can be specified. The invoice
1834   message can include references to an order (BuyerOrderReferencedDocument), a delivery note (Deliv-
1835   eryNoteReferencedDocument) and arbitrary other documents (AdditionalReferencedDocument). Whereas
1836   in the case of the first two document types, the referenced document type is implicitly defined in the doc-
1837   ument name. In the last case the referenced document type must be explicitly specified. However, the
1838   data type described above is the basis for all three references. As a result, in the first two cases, the
1839   ZUGFeRD schema also provides the opportunity to explicitly specify the document type, even though this
1840   is not required. The documents referred to in the appendix relating to the data model and the XML sche-
1841   ma define which elements are applicable in any given case.

1842

```
Example of document references:
(possible from the Comfort profile upwards)

<ram:BuyerOrderReferencedDocument>
   <ram:IssueDateTime>2013-08-01T00:00:00</ram:IssueDateTime>
   <ram:ID>B123456789</ram:ID>
</ram:BuyerOrderReferencedDocument>

<ram:AdditionalReferencedDocument>
   <ram:IssueDateTime>2013-08-05T00:00:00</ram:IssueDateTime>
   <ram:ID>A87654321012345</ram:ID>
   <ram:ReferenceTypeCode>AAA</ram:ReferenceTypeCode>
</ram:AdditionalReferencedDocument>
```

1843   *Example 42: Specifying document references*

1844   The following status indicators are used for this purpose (cf. chapter 5.1): Elements with the status "Re-
1845   quired" must be specified. For elements marked as "Advised", FeRD recommends that the respective in-
1846   formation be specified. The "Dependent" status means that the particular element must be specified in
1847   certain situations. An example is the IBAN if SEPA credit transfer is given as the means of payment. Op-
1848   tional elements only need to be specified if required by the relevant business process.

1849

6.3 Basic schema structure

1850

1851 Approach based on process and business relationship (not document-based)
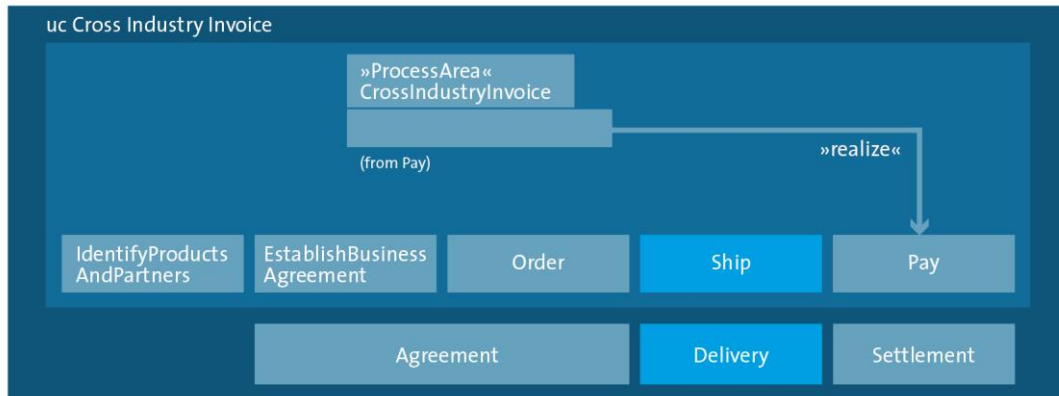
1852

1853 *Figure 15: Process-oriented structure of the Cross Industry Invoice*

1854

```
Basic structure of the XML instance
<rsm:CrossIndustryDocument>
   <rsm:SpecifiedExchangedDocumentContext />
   <rsm:HeaderExchangedDocument />
   <rsm:SpecifiedSupplyChainTradeTransaction>
      <ram:ApplicableSupplyChainTradeAgreement />
      <ram:ApplicableSupplyChainTradeDelivery />
      <ram:ApplicableSupplyChainTradeSettlement />
      <ram:IncludedSupplyChainTradeLineItem>
         <ram:AssociatedDocumentLineDocument />
         <ram:ApplicableSupplyChainTradeAgreement />
         <ram:ApplicableSupplyChainTradeDelivery />
         <ram:ApplicableSupplyChainTradeSettlement />
         <ram:SpecifiedTradeProduct />
      </ram:IncludedSupplyChainTradeLineItem>
   </rsm:SpecifiedSupplyChainTradeTransaction>
</rsm:CrossIndustryDocument>
```

1855 *Figure 16: Basic structure of the XML instance*

6.4 Profiles

As already mentioned in chapter 3.5, ZUGFeRD consists of three profiles, namely BASIC, COMFORT and EXTENDED. The BASIC and COMFORT profiles are subsets of the EXTENDED profile. For this reason, FeRD only publishes one schema to the Extended profile. This ensures maximum compatibility in the receiving system as this system only has to validate the file received against an overall schema.

The sender or the software used by the sender now decides the profile with which it wishes to conform. In so doing, a profile level defines which information is to at least be transmitted in structured form. Example: only information which can be mapped in a <u>structured</u> manner in accordance with the BASIC profile is transferred. Additionally, an article number should now be transferred in the respective structured field. Since this is part of the COMFORT profile, the invoice is therefore granted the COMFORT profile status. In the next step, only a buyer's reference needs to be inserted, even though this can only be mapped in free text in the generating system. Since this information is to be transferred in structured form from the COMFORT profile upwards (BuyerReference), the invoice reverts back to the BASIC profile.

As a result of using this method, an invoice may contain more structured information than is prescribed by the respective profile.

In this respect, it is at the discretion of the recipient or its receiving system as to whether provide processing support to the BASIC profile, for example. If this system receives an invoice as described in the example above or even in the EXTENDED profile, the additional information must not be lost as it may be relevant for the posting and processing of the invoice. However, the target system is not always able to map all information. We therefore recommend that all non-mappable values be transferred to free text fields with the structure "Element name = Value". This ensures that, even in the case of basic receiving systems, the user is able to access all of the data contained in the XML file.

1879 ***Example***

```
1880  The following item information is transferred in the Extended profile:
1881
1882  <ram:SpecifiedTradeProduct>
1883        <ram:Name>Squared timber</ram:Name>
1884        <ram:ApplicableProductCharacteristic>
1885              <ram:TypeCode>LENGTH</ram:TypeCode>
1886              <ram:Description>Length</ram:Description>
1887              <ram:ValueMeasure unitCode="MTR">3.21</ram:Value>
1888        </ram:ApplicableProductCharacteristic>
1889  </ram:SpecifiedTradeProduct>
1890
1891  Representation in the receiving system as free text if the system is unable to process
1892  the information in structured form:
1893
1894  Product characteristics =
1895        Name = Squared timber
1896        Length = 3.21 MTR
1897
```

1898 *Figure 17: Handling elements which the receiving system is unable to process*

1899 There is also the possibility to display the XML data to the user in standardised form with the aid of a style
1900 sheet. A style sheet is provided by FeRD as per the appendix.

1901 The supported ZUGFeRD profile and the version must always be specified in ZUGFeRD. Specifying the pro-
1902 file allows relevant internal processes to be controlled upon receipt of the invoice by the invoicee.

1903

1904 The profile used is specified under the field name "Application Recommendation" in the field entitled
1905 "Document Context Parameter".

1906 <u>The following structure is defined:</u>

1907 urn:ferd:CrossIndustryDocument:invoice:(ZUGFeRD version):(ZUGFeRD profile)

1908

1909   The following structures can be specified for ZUGFeRD version 1.0:

1910   BASIC: urn:ferd:CrossIndustryDocument:invoice:1p0:basic

1911   COMFORT: urn:ferd:CrossIndustryDocument:invoice:1p0:comfort

1912   EXTENDED: urn:ferd:CrossIndustryDocument:invoice:1p0:extended

1913   In order to identify industry profiles which are ZUGFeRD-compatible, there is the option to extend the
1914   structure, e.g. "urn:ferd:CrossIndustryDocument:invoice:1p0:extended:gs1" for identifying the GS1
1915   ZUGFeRD implementation recommendation. An industry profile referenced in this manner must always be
1916   a subset of the specified ZUGFeRD profile. In this case, it is a subset of the EXTENDED profile.

1917   ## 6.5   ZUGFeRD code lists

1918   The objective of structured data transfer is that data can be processed on an automated basis by a com-
1919   puter. Looking, for example, at the "Country of the invoicee" or "Invoice currency" fields, these may in
1920   each case only include certain valid entries (codes). In order for a computer to be able to process the en-
1921   tries precisely, UN/CEFACT or the ISO compile standardised lists (code lists) of possible ways in which they
1922   can be displayed. For instance, the euro currency is abbreviated to "EUR" and is not represented by the
1923   currency symbol (€), nor is it written out in full (euro).

1924   The code lists used in ZUGFeRD are adopted from the European MUG recommendation and are generally
1925   based on UN/CEFACT or ISO code lists. In the case of the MUG recommendation, some of these code lists
1926   were restricted so as to facilitate implementation. In those cases where no international reference model
1927   was available, ZUGFeRD-specific code lists were developed. All ZUGFeRD code lists can be found in the
1928   appendix.

1929   The code lists are not integrated into the ZUGFeRD XML schema and are maintained separately. This pre-
1930   vents any unnecessary updates of the underlying schema, which in turn makes systems more stable. Oth-
1931   erwise, a new, potentially incompatible schema would have to be produced for every change made to the
1932   code lists.

1933   In order for ZUGFeRD invoices to be transferred without any prior bilateral arrangement, no codes may be
1934   used other than those published by FeRD. Requests for amendments and additions can be made via FeRD.

1935

6.6 Conventions

6.6.1 Currency specification

Only one currency can be specified in ZUGFeRD invoices.

In order to allow all totals in the core invoice to be calculated without taking exchange rates into account, all amounts used in the calculation of the invoice must be specified in the invoice currency.

In ZUGFeRD, the currency must be specified for each amount. To do this, the ISO code list "ISO 4217 Alpha-3 Code" is used (cf. MUG Rule 6 - Invoice currency with adjustments for ZUGFeRD).

6.6.2 Decimal points

Amounts are shown to two decimal places and are rounded where necessary (e.g. `15.00`).

VAT rates are stated as percentages with maximum 2 decimals. E.g. twenty one and one third percent is stated as 21.33. Quantities are shown to four decimal places (e.g. `1.0000`).

Prices and interim values in the calculation of the discount are shown to four decimal places (e.g. `0.6667`).

(Cf. MUG Rule 9 – Decimals with adjustments for ZUGFeRD).

6.6.3 Date formats

As a result of using the UN/CEFACT reference library, there are two basic date formats in ZUGFeRD. In most cases, a date can be transferred as a formatted string with format specification. As a result, it is also possible to specify service periods. The only permitted date formats in ZUGFeRD are the calendar date – YYYYMMTT (code 102), the calendar month – YYYYMM (code 610) and the calendar week – YYYYWW (code 616), e.g. for delivery periods. In document references in particular, the document date is specified as an XML DateTime data type. The format is then yyyy-mm-ddThh:mm:ss, for example **2014-06-25T00:00:00**.

6.6.4 Language codes

ZUGFeRD does not support for the implementation of multilingual texts, e.g. in article names. The language for the invoice as a whole is specified in accordance with ISO 639-1 (Alpha-2 code) in lower case characters, e.g. "de" for German.

6.6.5 Handling empty fields

Empty fields are not permitted in ZUGFeRD. Fields should always be filled with meaningful content. If a field is not filled, this must be omitted in the XML file (structured invoice data).

6.6.6 File sizes

The file for transfer (PDF, XML and attachments) should not be larger than the standard file sizes, depending on the method selected for sending the file (e.g. e-mail, FTP, etc.).

6.7 Versioning

The version identifier in the respective URN (see chapter 6.4) has the following structure: M**p**N

M stands for a major version, N for a minor version, and p for the separating point since the point "." is defined as a domain delimiter.

All publications within a major version are forward-compatible. All added elements are optional. This means that an invoice which has been prepared using software with an earlier minor version can be easily received and processed using software which is already running a more recent minor version. Example: An invoicer sends a ZUGFeRD invoice using version 1.0 to an invoicee who is already using version 1.2. The invoicee can process the invoice easily. The reverse case does not work (in most instances) since the in-voice may contain additional information which the older system is not yet able to process.

If applications for changes or, for example, statutory regulations require a version to be created which is neither forward nor backward-compatible, the number of the major version changes. This may be the case in the event of structural changes or if new, required data has to be included which cannot otherwise be mapped.

As code lists are not integrated in the schema, these are published separately and are given a separate version number in the same format. Similarly, XML style sheets are provided with version numbers. The name of the underlying code list version is also added as the style sheet translates selected code lists into clear text.

Example

```
Name of the ZUGFERD schema file:       ZUGFeRD_1p0.xsd
Name of the ZUGFeRD code list file:    ZUGFeRD_1p0_c1p0_Codelisten.xlsx
Name of the ZUGFeRD style sheet file:  ZUGFeRD_1p0_c1p0_s1p0_Stylesheet.xslt
```

Example 43: Versioning

6.8 Implementation guidance for version upgrades

Upon the release of a new version, an invoice-issuing system may be upgraded to the new version. This is not compulsory though since the old version is still valid. However, an invoice-receiving system should be upgraded to the new version whenever a new version is released. This means that the support provided for the old version is not replaced as there may still be issuing systems which have not upgraded to the more recent version.

Specific information on the differences between two released versions can be found in the separate documentation as listed in the appendix.

7   Embedding in a PDF/A-3 file

Since the end of 2005, PDF/A has been the ISO standardised version of a PDF-based document format designed for long-term archival storage. It is now widely accepted in all industries and has been adopted by many users.

At present ISO has published three parts to the standard: PDF/A-1 or ISO 19005-1, PDF/A-2 or ISO 19005-2 and PDF/A-3 or ISO 19005-3. To reflect the technical enhancement in the world of IT, ISO has clearly stated that the approved parts will never become invalid and that the individual parts define new, useful features. PDF/A-1 (ISO 19005-1) and PDF/A-3 (ISO 19005-3) were adopted in 2005 and 2012 respectively.

Compared to PDF/A-2, the new PDF/A-3 offers only one additional feature: users can embed arbitrary file formats in a PDF/A-3 file. By enhancing the nature of PDF/A so that it serves not only as a format for long-term archiving but also as a container, the demands of enterprises, authorities and software manufacturers can be met. Among other things, it also allows PDF/A to be used in a new areas, such as the sending and receiving of invoices together with a XML payload.

Archiving of digital documents can be integrated at an early stage in the document life cycle, whilst still retaining the option of editing them further (keyword "hybrid archiving"). For example, Excel tables, Word files or even CAD drawings for which the life cycle is still ongoing can be firmly combined with their archivable PDF/A counterpart in one file.

In the *Central User Guidelines of the Forum for Electronic Invoicing in Germany (ZUGFeRD)*, which describes the document and data format for exchanging electronic invoices, PDF/A-3 is defined as a carrier format. It is distinguished by three main characteristics:

1. The invoice data is represented visually by means of a PDF/A-3-compliant document. This document shows the invoice in a form that is readable to the human eye and can be archived for the long-term. At the same time, compliance with PDF/A also guarantees that the technical quality of invoice files is high, which virtually eliminates interpretation or presentation errors.

2. The invoice data is embedded in the PDF/A file in the XML format with a relationship to the whole document via a file specification dictionary. In the current version of the ZUGFeRD standard, integration of only one invoice data document is permitted per PDF/A-3 document. As a basic principle, it is of course possible to use PDF/A-3 as a container for several files, thereby enabling additional information on the invoice check to be packaged and be pooled together in PDF/A-3. The main advantage is that XML is machine-readable and can therefore be automatically processed further without having to deal with digitising paper documents.

3. The PDF/A-3 document is classified as a ZUGFeRD-compliant invoice by means of a specific XMP extension schema and the accompanying XMP metadata. The PDF/A standard requires both the schema definition and the metadata itself to be embedded in the document. In addition to the PDF/A property and the level of conformance, the metadata also include the identification that

2039   the document is a ZUGFeRD invoice. Besides the version of the ZUGFeRD standard, the ZUGFeRD
2040   profiles (Basic, Comfort or Extended) is also stored here.

2041

2042 PDF/A-3 is the ideal carrier format for ZUGFeRD invoices as it allows users to package XML invoice data
2043 together with the invoice image and the linking metadata in a standardised manner.

2044

2045 The internal constructs of the PDF/A-3 document must be as follows in order to guarantee conformance:

2046   • a PDF/A-3-compliant structure, i.e. the original document is already compliant with PDF/A-3 with-
2047   out the embedded data! The level of conformance (i.e. 3a, 3b or 3u) does not matter.

2048   • embedding of the XML file via an "Alternative" relationship type with a relationship to the whole
2049   document.

2050   • the presence of a specific XMP extension schema to describe the document as a ZUGFeRD-
2051   compliant invoice as well as the presence of the relevant XMP metadata

2052

2053 There are no ZUGFeRD conventions regarding the file name of the PDF document itself.

2054
2055 These premisses are described in more detail below.

2056

7.1 PDF/A-3-compliant structure

A PDF/A-3-compliant document must meet the requirements of ISO 19005-3[11]. This describes the fundamental differences and restrictions of an A-3 file based on the underlying ISO 32000-1[12] standard, also known as PDF 1.7. These are essentially requirements which are already set out in the predecessor standards PDF/A-1[13] and PDF/A-2[14].

The most important features of a PDF/A file compared to an arbitrary PDF document are present:

- There must be an indication in the form of an XMP extension schema which explicitly contains the PDF/A property and the level of conformance.

- All metadata must be embedded in XMP form. The XMP schema used can be taken either from the multitude of predefined schemas or a separate schema must be created and must always be embedded together with the metadata.

- All of the fonts used must be embedded in the PDF/A file. For the purposes of optimisation, it is also possible to embed only subsets of the glyphs actually used, instead of full fonts.

- No external files such as films, sound files or other binary files should be embedded, unless the A-3 compliant mechanism described subsequently is used.

- No more active elements must be present in PDF/A. These include JavaScript for actions or Flash for animations, for example.

- Only precisely defined image formats may be embedded. These include CCITT Group 3 and Group 4, JBIG2, JPEG and JPEG2000.

- The document must contain no encryption or other authorisation control. DRM is forbidden.

7.2 Embedding of the XML file

The invoice data in the XML format is embedded using a file specification dictionary[15]. In order to do this, a valid MIME type must be specified for the document to be embedded. The MIME type for ZUGFeRD is always `text/xml`.

The embedded file's stream dictionary should contain a `Params` key. `Params` refers to a dictionary containing at least a `ModDate` indicating the last modification date of the embedded file.

The embedded document must also be included in the `Names` object tree so as to enable compliant PDF tools to represent the file together with additional information.

As a basic principle, several files can be embedded in the PDF/A-3 document, thereby enabling information documents relating to the invoice check to be packaged together with the invoice data document

---

[11] Cf. [IS1903]
[12] Cf. [IS3201]
[13] Cf. [IS1901]
[14] Cf. [IS1902]
[15] Cf. [IS3201], section 7.11.3

in the PDF/A-3. To identify, at PDF level, which of the embedded files is the invoice data document, the name of the invoice data document must be included in the corresponding metadata attribute.

The XML file is always embedded with the name "ZUGFeRD-invoice.xml". There is also the option to embed other documents explaining the invoice as additional files.

7.2.1 Embedding relationship

In the PDF/A-3 standard, an embedded file can basically relate to the whole (PDF) document (document level) or to a particular page (page level). Irrespective of the type of relationship, the file specification dictionary can be found in either the Document dictionary or the Page dictionary. The relationship link is established by use of an array called `AF` (for Associated Files), which is entered in the respective dictionaries and contains a reference to the file specification dictionary.

In version 1.0 of the ZUGFeRD standard, only one single invoice data document may be embedded per PDF/A-3 document. The "document level" is therefore the relationship type to be selected. This does not affect the embedding of other documents and files which do not contain any invoice data.

7.2.2 Data relationship

In addition to the relationship type, ISO 19005-3 requires a data relationship to be specified, i.e. the relationship between the embedded document and the PDF part, i.e. the visualisation. This data relationship is expressed by the `AFRelationship` tag and may have one of the following values:

- `Data` – The embedded file contains data which is used for the visual representation in the PDF part, e.g. for a table or a graph.
- `Source` – The embedded file contains the source data for the visual representation derived therefrom in the PDF part, e.g. a PDF file created via an XSL transformation from an (embedded) XML source file or the MS Word file from which the PDF file was created.
- `Alternative` – This data relationship should be used if the embedded data are an alternative representation of the PDF contents.
- `Supplement` – This data relationship is used if the embedded file serves neither as the source nor as the alternative representation, but the file contains additional information, e.g. on easier automatic processing.
- `Unspecified` – If none of the data relationships above apply or there is an unknown data relationship, this data relationship is used.

Note:

There are no technical consequences within the PDF file from specifying the data relationship. In particular, this means that specifying a `Source` data relationship, for instance, does not suggest that the contents of the embedded data and the invoice image are identical. Instead, they provide the invoicee with an indication of how the role of the embedded data should be understood.

2122 The `Alternative` value must be specified for ZUGFeRD. This is designed to illustrate that the relevant

2123 content in terms of tax law of both representations is the same and that the XML file is merely another or

2124 an alternative and independent form of representation which is better suited to machine processing (cop-

2125 ies of a document with identical contents).

2126 The diagram below highlights this structure using the example of a ZUGFeRD XML invoice. The embedded

2127 invoice file (for ZUGFeRD always) has the name `ZUGFeRD-invoice.xml`. The array AF is part of the

2128 document dictionaries (directly under Root), which is why the invoice file always refers to the whole doc-

2129 ument. The data relationship is `Alternative`, i.e. the XML invoice data is an alternative form of the

2130 presenting the PDF visualisation.

2131
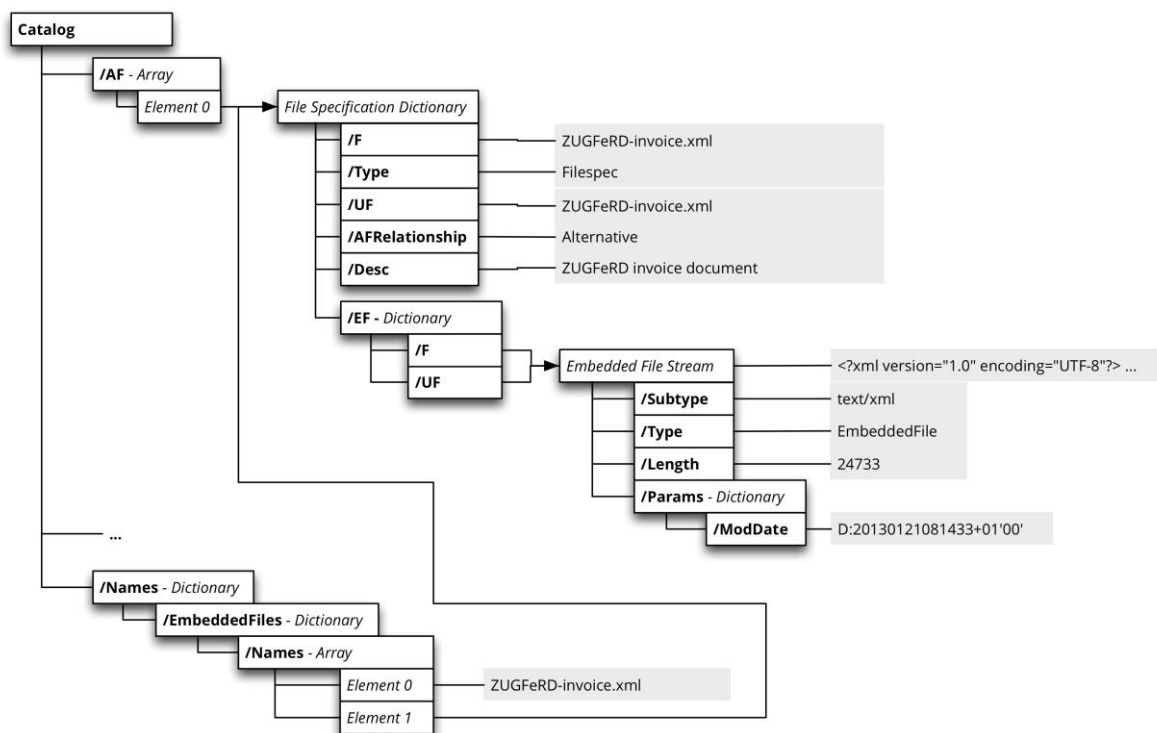
2132

2133 *Figure 18: PDF/A-3 structure for embedding a ZUGFeRD XML file*

2134

7.3 PDF/A extension schema ZUGFeRD

2135

2136 If the metadata attributes are user-specific (i.e. they are not included in the XMP schemas declared in the

2137 PDF/A standard), a separate metadata schema must be defined in order for metadata to be included in a

2138 way which conforms to the PDF/A standard. This schema definition complies with the conventions for

2139 PDF/A extension schemas[16]. In addition to the specific form of metadata, the extension schema must also

2140 be embedded into each PDF/A document. Simply referring to a form of external storage is not enough.

2141 A corresponding extension schema is defined for using invoice documents which conform to ZUGFeRD.

2142

2143 The properties of the extension schema are shown below:

Property	Value	Description
Name of the extension schema	ZUGFeRD PDFA Extension Schema	
URI	`urn:ferd:pdfa:CrossIndustryDocument:invoice:1p0#`	The "#" character at the end of the URI should be noted!
Schema prefix	`zf`	Namespace prefix

2144 *Table 5: Properties of the XMP extension schema*

---

[16] Cf.[TN0008], [TN0009]

2145 <u>The table below shows the fields of the extension schema:</u>

Field	Description	Example
`zf:DocumentType`	For ZUGFeRD invoices, the document type always contains INVOICE	`INVOICE`
`zf:DocumentFileName`	The file name of the embedded invoice data document; must be identical with the value of the `F` tag in the file specification dictionary. In the ZUGFeRD standard, this value is fixed as `ZUGFeRD-invoice.xml`	`ZUGFeRD-invoice.xml`
`zf:Version`	The version of the XML schema for the invoice data	`1.0`
`zf:ConformanceLevel`	The XML invoice data profile in accordance with ZUGFeRD requirements (permitted values: BASIC, COMFORT, EXTENDED)	`EXTENDED`

2146 *Table 6: XMP extension schema fields*

2147

2148 <u>The full PDF/A extension schema for ZUGFeRD:</u>

```
2149
2150 <!--   Copyright AWV e.V. 2014
2151
2152  This XMP schema specifies XMP entries for inclusion in ZUGFeRD compliant electronic
2153  invoice documents based on PDF/A-3. The following properties of the custom schema
2154 are used:
2155
2156  Schema name: ZUGFeRD Schema
2157  Schema namespace URI: urn:ferd:pdfa:CrossIndustryDocument:invoice:1p0
2158  Preferred schema namespace prefix: zf
2159
2160  Since this schema is beyond the set of predefined XMP 2004 schemas it includes a
2161  description of the custom schema according to the PDF/A requirements.
2162 -->
2163
2164 <!-- Several XMP entries in the custom schema -->
2165 <rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
2166
2167 <!-- XMP extension schema container for the ZUGFeRD schema -->
2168 <rdf:Description rdf:about=""
2169   xmlns:pdfaExtension="http://www.aiim.org/pdfa/ns/extension/"
2170   xmlns:pdfaSchema="http://www.aiim.org/pdfa/ns/schema#"
2171   xmlns:pdfaProperty="http://www.aiim.org/pdfa/ns/property#" >
2172
2173   <!-- Container for all embedded extension schema descriptions -->
2174   <pdfaExtension:schemas>
2175     <rdf:Bag>
2176       <rdf:li rdf:parseType="Resource">
2177         <!-- Optional description of schema -->
2178         <pdfaSchema:schema>ZUGFeRD PDFA Extension Schema</pdfaSchema:schema>
2179         <!-- Schema namespace URI -->
2180         <pdfaSche-
2181 ma:namespaceURI>urn:ferd:pdfa:CrossIndustryDocument:invoice:1p0#</pdfaSchema:namespa
2182 ceURI>
2183         <!-- Preferred schema namespace prefix -->
```

```
2184          <pdfaSchema:prefix>zf</pdfaSchema:prefix>
2185
2186          <!-- Description of schema properties -->
2187          <pdfaSchema:property>
2188            <rdf:Seq>
2189              <rdf:li rdf:parseType="Resource">
2190                  <!-- DocumentFileName: Name of the embedded file;
2191                       must be equal with the value of the /F tag in the /EF
2192                       structure -->
2193                <pdfaProperty:name>DocumentFileName
2194                    </pdfaProperty:name>
2195                <pdfaProperty:valueType>Text
2196                    </pdfaProperty:valueType>
2197                <pdfaProperty:category>external
2198                    </pdfaProperty:category>
2199                <pdfaProperty:description>name of the embedded xml invoice file<
2200                    /pdfaProperty:description>
2201              </rdf:li>
2202
2203              <rdf:li rdf:parseType="Resource">
2204                  <!-- DocumentType: INVOICE -->
2205                <pdfaProperty:name>DocumentType</pdfaProperty:name>
2206                <pdfaProperty:valueType>Text
2207                    </pdfaProperty:valueType>
2208                <pdfaProperty:category>external
2209                    </pdfaProperty:category>
2210                <pdfaProperty:description>INVOICE
2211                    </pdfaProperty:description>
2212              </rdf:li>
2213
2214              <rdf:li rdf:parseType="Resource">
2215                  <!-- Version: The actual version of the
2216                       ZUGFeRD XML schema -->
2217                <pdfaProperty:name>Version
2218                    </pdfaProperty:name>
2219                <pdfaProperty:valueType>Text
2220                    </pdfaProperty:valueType>
2221                <pdfaProperty:category>external
2222                    </pdfaProperty:category>
2223                <pdfaProperty:description>The actual version of the ZUGFeRD XML schema
2224                    </pdfaProperty:description>
2225              </rdf:li>
2226
2227              <rdf:li rdf:parseType="Resource">
2228                  <!-- ConformanceLevel:  The actual conformance
2229                       level (resp. profile) of the embedded ZUGFeRD XML data,
2230                       e.g. BASIC, COMFORT, EXTENDED -->
2231                <pdfaProperty:name>ConformanceLevel
2232                    </pdfaProperty:name>
2233                <pdfaProperty:valueType>Text
2234                    </pdfaProperty:valueType>
2235                <pdfaProperty:category>external
2236                    </pdfaProperty:category>
2237                <pdfaProperty:description>The conformance level of the embedded
2238                                  ZUGFeRD data
2239                    </pdfaProperty:description>
2240              </rdf:li>
2241            </rdf:Seq>
2242          </pdfaSchema:property>
2243        </rdf:li>
2244      </rdf:Bag>
2245    </pdfaExtension:schemas>
2246  </rdf:Description>
2247 </rdf:RDF>
```

2248 *Figure 19: The XMP extension schema*

2249 <u>Example</u>

2250 An example document (in this case together with the sample invoice data) illustrates how the extension

2251 schema is used in a PDF/A document.

```
<rdf:Description rdf:about=""

xmlns:zf="urn:ferd:pdfa:CrossIndustryDocument:invoice:1p0#">
  <zf:DocumentType>INVOICE</zf:DocumentType>
  <zf:DocumentFileName>ZUGFeRD-invoice.xml</zf:DocumentFileName>
  <zf:Version>1.0</zf:Version>
  <zf:ConformanceLevel>BASIC</zf:ConformanceLevel>
</rdf:Description>
```

2252

2253 *Example 44: Use of the XMP extension schema*

2254 <u>Note:</u>

2255 The URN of the extension schema must end in the character "#".

7.4   Embedding of additional files

2256

2257 In addition to the XML invoice file, the PDF/A-3 standard also allows the embedding of arbitrary other

2258 files. In so doing, only the MIME type for the file in question needs to be specified. In the context of

2259 ZUGFeRD, spreadsheets containing calculations and dimensions (XLSX, ODS, etc.), CAD drawings (PDF,

2260 DWG, etc.), images (JPEG, PNG, etc.) or other XML files which are technically related to the invoice or

2261 which may be relevant for checking the invoice's contents, can therefore be incorporated.

2262 Whereas the embedding into the PDF/A-3 document conforms to the requirements of the ISO standard,

2263 ZUGFeRD does not need to record or store any further metadata for the additional files that have been

2264 incorporated. This means that ZUGFeRD does not specify any XMP metadata structures for non-invoice

2265 files.

2266 The figure below shows the data structures in a PDF/A-3 file in which an MS Excel file with dimensional

2267 data for the invoice under the name `list_of_measurement.xlsx` is incorporated, together with the

2268 ZUGFeRD invoice file (here named `ZUGFeRD-invoice.xml`).

2269
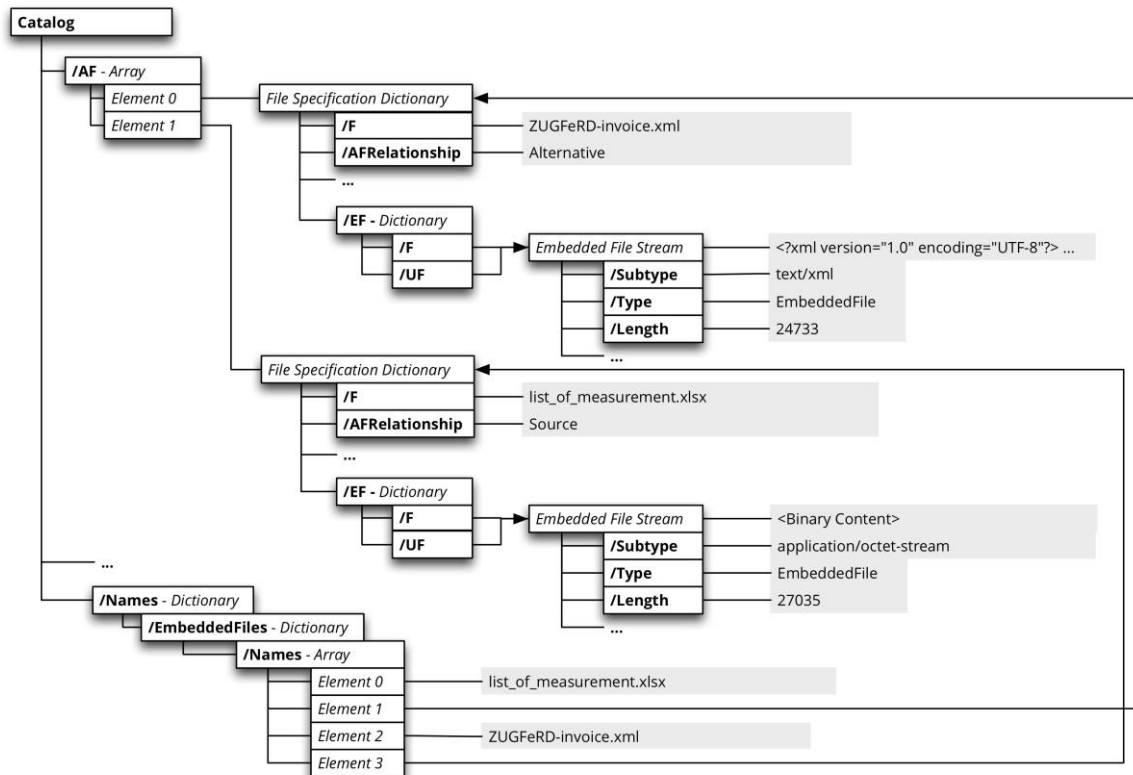
2270

2271   *Figure 20: PDF/A-3 structure with additional embedded file*

2272

2273   In terms of attachments, the invoicer can expect the invoicee to be able to process at least the following
2274   formats:

2275   • PDF format

2276   • TXT format

2277   • GIF format

2278   • TIFF format

2279   • JPG format

2280   • CSV format

2281   • XML format

2282

2283   (Cf. MUG Rule 11 – Attachments, amended for ZUGFeRD)

2284

2285 # 8 Technical implementation

2286

2287 ## 8.1 Implementation methods

2288 As a basic principle, the ZUGFeRD-compatible XML data is embedded in a PDF/A-3 file when an invoice is
2289 generated. The system receiving the invoices reads the XML data in order to then transfer it into the sys-
2290 tem processing the invoices.

2291 The aim of this chapter is to explain how implementation can take place and what kind of integration sce-
2292 narios may arise. First, it should be pointed out that, unfortunately, there is not ONE SINGLE solution.
2293 Instead, the best possible method of creating and processing invoices will always depend on the specific
2294 systems involved.

2295 ***Creating invoices***

2296 The following principal methods are currently used to create invoices**,** e.g. in an ERP or specialist system:
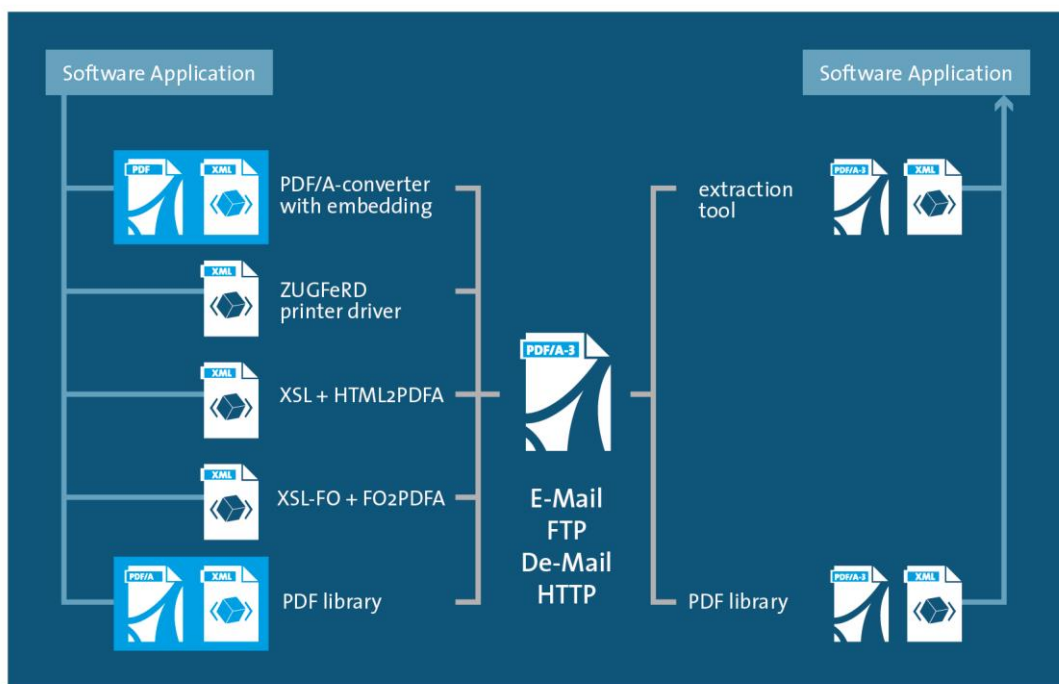
2297

2298 *Figure 21: Generating and processing a ZUGFeRD invoice*

2299

Scenario 1: A technical reworking of the creation of PDFs in the system is already planned.

If the manufacturer is already addressing the technical side of document implementation as part of a product planning process, a new PDF tool can be used here that generates correct PDF/A documents while also supporting PDF/A-3 documents, including embedding of third-party data.

In technical terms, these are usually what are known as PDF software development kits (SDKs) or PDF libraries. When choosing a new PDF tool, therefore, it is important to make sure that the provider supports both PDF/A-1 and PDF/A-3. Additional technical aspects such as the SDK programming language, e.g. C, Java or .NET, operating system support, and 32-bit and 64-bit support also play important roles.

At present, this scenario will be quite rare in practice, which is also reflected in the low but rising number of ERP systems that are already capable of generating invoices in PDF/A-3 format.

Scenario 2: The system's existing integrated PDF tools already supporting PDF/A and PDF/A-3 generation in principle.

With new releases of PDF tools and SDKs, the opportunity to generate PDF/A-3 documents is also often incorporated into the development components of the ERP or specialist system manufacturers. In this case, the respective PDF tool in particular must be checked in respect of the interfaces it offers and the PDF/A quality it produces.

Scenario 3: The PDF/A-3 is generated as a post-processing step.

This method is based on a PDF (not PDF/A-compliant) that has already been generated plus the possibility of exporting invoice data simultaneously from the specialist system as net content or even XML data.

The PDF invoice documents are then converted into PDF/A-3-compliant documents in a post-processing step in the invoice generation workflow before the XML data is then embedded in a ZUGFeRD-compliant manner. Integration can take place either at command line level or by integrating a corresponding library.

Implementation based on PDF printer drivers are a special case. Two different methods are used in this regard. In the first, the creation of the PDF/A from a non-PDF-capable application is initiated via the standard printing process. Here too, however, the embedding of the XML invoice data requires separate preparation by the specialist system in parallel with the printing process.

The second method is described below.

Scenario 4: Identifying invoice data from the print stream

The invoice-generating application is not capable of generating net data in a structured form alongside the printing process. For this reason, an attempt is made here to read the key invoice data from the print stream itself or to identify it in the print data. One example of this is the use of a word processing program to create invoices. This method, to which using OCR is comparable with a scanned invoice template, requires the invoice image to remain unchanged between different invoice runs. The parameter identifica-

2333   tion function must also be "trained" to recognise the invoice image. This method is consequently a reliable

2334   way of reading the parameters required for ZUGFeRD's Basic profile, thereby enabling an appropriate

2335   PDF/A-3 ZUGFeRD invoice to be created before being e-mailed out.

2336   ***Scenario 5: High-volume generation of invoices using output management solutions.***

2337   Telecommunications providers and utilities companies often employ sophisticated output management

2338   solutions to generate large volumes of invoices, using the AFP format to print and e-mail them.

2339   In this case, the individual output management system suppliers must clarify how PDF/A-3 invoices can be

2340   created. Because bulk invoices of this kind have a simple structure, generating PDF/A-3-compliant invoices

2341   from AFP spools does not present a challenge. The main problem lies in enriching the (printed) invoices

2342   with the structured data, which makes it necessary to intervene in production processes.

2343

2344   The five scenarios listed describe methods suitable for the providers of ERP or inventory control systems

2345   that can modify their products themselves. Users whose system for generating invoices does not (yet)

2346   support the creation of PDF/A-3 documents can implement the third or fourth method without too much

2347   effort.

2348   Many systems typically provide an interface to export invoice data as XML, requiring a one-off mapping to

2349   the ZUGFeRD schema. There are also server tools, for example, that convert PDF invoices to PDF/A and

2350   embed the XML data.

2351

2352   ***Receiving invoices***

2353   Receiving invoices is the counterpart process to creating them. A company can receive PDF/A-3 files elec-

2354   tronically in order to transfer the data into its invoice system such as ERP or DMS/ECM.

2355   Here, the XML data can typically be extracted from the PDF/A-3 file using a PDF SDK or a command line

2356   program. Suitable tools are already available free of charge on the market. It is then usually necessary to

2357   map ZUGFeRD's XML structure to the target system's data format.

2358   For the technical details on implementing PDF/A-3, see the appendix. Providers can be searched for on the

2359   website of the Forum for Electronic Invoicing in Germany at www.zugferd.de.

2360

8.2 ZUGFeRD style sheet

FeRD also supplies a uniform style sheet for each published version to ensure that the XML file is readable. This means that the receiving system is always able to represent the XML data in a standardised manner, thus guaranteeing the independence of the PDF component of the ZUGFeRD data file. The style sheet can be found as set out in the appendix and allows data from all ZUGFeRD profiles to be visualised. It is based on the rules governing the creation of style sheets in accordance with XSLT 2.0. This allows the requirements made of dynamic invoice data to be met and ensures that ZUGFeRD invoices are legible in their respective environment.

8.3 Test indicator

The test indicator can be used when introducing a new system to flag the invoice as a "test invoice". The test indicator flags the invoice so that it will not be processed in the target system. No VAT liability arises. This indicator is used in particular in the introductory phase for new business relationships.

If an invoice is to be flagged as a test invoice, `true` is entered in the field.

The test indicator only relates to the XML invoice. If the PDF is also to be flagged as a test, this must be indicated separately on the PDF invoice.

8.4 Further help with implementation

You can find some extra help with implementation as well as information on software providers, consultancy firms, open source communities, validation portals, etc. at www.zugferd.de.

9   Practical examples

This chapter illustrates two examples of ZUGFeRD in use, from the business sector and public administration, which are intended to showcase the potential that ZUGFeRD offers while also serving as an aid for own implementation.

9.1   Public administration as an application scenario – the German Federal Office of Administration (BVA)

The German Federal Office of Administration (BVA) is a separate superior federal authority assigned to the sphere of activity of the German Federal Ministry of the Interior (BMI). In its capacity as a central service provider for the federal government, it performs over 150 different tasks to relieve the administrative burden on all government departments. As well as its headquarters in Cologne, the BVA has offices in 17 other locations throughout Germany and currently employs some 2,600 staff. The BVA is currently supported by a further 1,400 employees for the tasks delegated to it by the German armed forces.

Several pilot projects have been launched in the BMI's sphere of activity designed to examine various different aspects of e-invoicing in the pilot phase. As the BVA has used ERP software from MACH AG for over ten years and uses it to generate some 50,000 payments annually, the BMI asked the BVA to run a pilot project for "exchanging invoices and integration into MACH software".

Given that the BVA receives a very high number of invoices each day, it has a major vested interest in implementing an electronic exchange of invoices as well as their further processing. The allocation, distribution and recording of invoices internally at authority's through to making them ready for payment usually creates a significant amount of work, which can be reduced considerably by using electronic invoices.

The BVA already uses electronic invoice processing more or less universally, having introduced a web-based procurement workflow some six years ago. This maps and documents all process steps, from the notification of a request through to the receipt of goods. All associated documents are attached digitally to the corresponding procedure and forwarded to the competent employee until the procurement measure is completed with a countersignature.

Around four years ago, the BVA also set up a workflow for processing invoices and a central accounting function. After an invoice has been received by the mailroom, it is scanned, digitised and passed on to central accounting, which records the invoice using the digital invoice image and posts it to the single- and double-entry ledgers before initiating a countersignature via the workflow. Insofar as the invoice relates to a procurement process, the assignment and interlinking of the processes is also established. The invoice is then archived in the software or on the database server in a revision-proof manner. For some time, therefore, paper-based invoices have only played a minor role.

The BVA intends to introduce e-invoices in several stages. First of all, the plan is to enable invoices to be exchanged electronically, considering primarily the payment obligations resulting from procurement

2415 measures as well as from services and telecommunications. As a result, BVA must first gradually convince

2416 its contractors of the benefits of sending invoices electronically and encourage them to transmit their

2417 invoices to the BVA in digital form in the pilot phase. A sizeable number of suppliers and contractors have

2418 already been won over to the concept.

2419 To keep outlay to a minimum, the BVA chose e-mail as its preferred channel for receiving invoices and set

2420 up a new functional inbox for central accounting. Invoices are sent as attachments in PDF format. This

2421 saves the invoicer the costs for paper, printing and postage, while the BVA saves time and money on mail

2422 receipt, transport and scanning by having e-mails sent directly to central accounting.

2423 The BVA has already created the technical prerequisites for this first step and is able to import e-mailed

2424 invoices into its ERP software in an automated and time-controlled manner and make them available to

2425 central accounting. Initially, however, it is still necessary to transfer invoice data manually from the invoice

2426 image into the entry fields.

2427 In a second step, the BVA would like to implement the electronic exchange of invoices in PDF/A-3 format

2428 with an embedded XML file and in so doing establish ZUGFeRD as its standard format. In this process,

2429 invoice data is to be extracted and all entry fields assigned the default setting, meaning that all that is still

2430 required is for the invoice to be checked and approved, with subsequent countersignature for assessment

2431 and allocation purposes. This procedure represents the target state. Eliminating the change of medium

2432 will actually increase the potential for optimisation. This stage has already been planned out and imple-

2433 mentation has begun.

2434 At the same time, the BVA would also like to be able to use OCR to read the accounting-related data fields

2435 from the invoice image of the PDF documents initially received (without structured data) and convert

2436 these too into a ZUGFeRD-compatible format. This offers the advantage of ensuring timely use in day-to-

2437 day work while also ensuring that only one additional process for processing invoice data needs to be

2438 implemented.

2439 The BVA and the software manufacturer will also introduce the creation of outgoing invoices with a

2440 ZUGFeRD structure and look for additional opportunities for use within the authority.

2441

2442   The figure below illustrates the planned procedure:
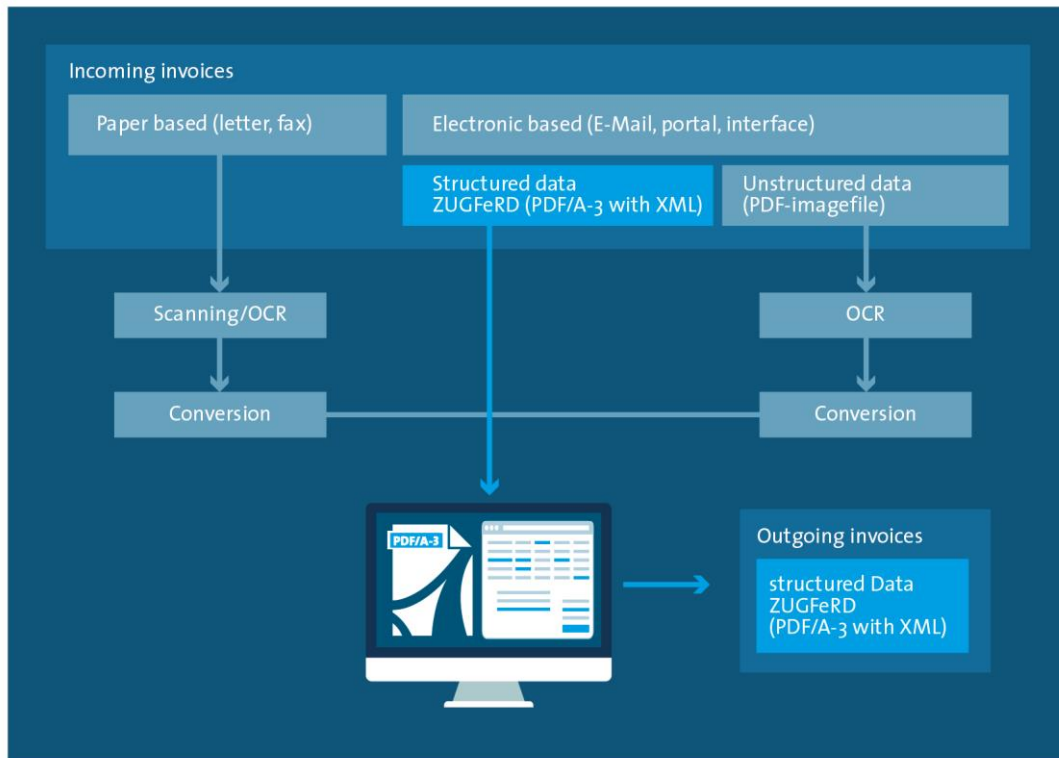
2443

2444   *Figure 22: Processing incoming invoices at the BVA*

2445   The BVA can expect significant gains in efficiency from the implementation thanks to faster processes,
2446   greater process security thanks to IT support, and the resulting cost savings. Environmental sustainability
2447   is another aspect that must not be forgotten: raw materials will be conserved and CO_2 emissions reduced
2448   in the long term. In addition, less paper means both less space and lower infrastructure costs required for
2449   archiving.

2450   For the BVA, e-invoicing is the final element that will close the electronic gap between the procurement
2451   workflow and the invoice processing workflow.

2452   As the use of electronic invoices is based initially on the principle of non-obligation, the BVA will continue
2453   to allow all methods of receipt and guarantee the processing of all invoice formats.

2454   Use of ERP software from MACH AG is very widespread in the BMI's sphere of activity. However, the soft-
2455   ware can also be found in other government departments, meaning that the BVA's solution can be trans-
2456   ferred to these areas of public administration as well.

2457

9.2 Electronic invoicing at the THW – ZUGFeRD standard pilot project

The Federal Agency for Technical Relief (THW) is one of the pilot agencies involved in the *e*Rechnung project of the German Federal Ministry of the Interior (BMI). In organisational terms, as a federal agency, THW is assigned to the sphere of activity of the BMI. Its decentralised structure means that electronic processes are particularly essential for the THW. Only one percent of the staff works full-time for the authority, with 99 percent of THW members working on a voluntary basis. In 668 local sections, more than 80,000 volunteers throughout Germany dedicate themselves in their free time to provide professional and active help to people in distress. Many invoices are raised as part of disaster relief missions in particular, all of which need to be processed, posted and paid accordingly.

The Federal Agency for Technical Relief adapts its structures in a flexible manner to changing requirements and technologies and is always seeking further ways to improve its business processes. Modern equipment and well-trained specialists, together with efficient and transparent processes, are the basis of its high efficiency – both in Germany and throughout the world.

As part of the *e*Rechnung project, an initial measure – carried out independently of the extensive process-related survey – is designed to improve the process for receiving invoices at the headquarters of THW in a relatively short timeframe. At present, invoices here are received on a centralised basis. The usual paper-based route internally is as follows:

President > Head of Department > Head of Unit > Officer responsible

However, it may also be the case that invoices are addressed directly to the officer responsible for handling the invoice. Incoming invoices are then initially booked as a suggested posting, followed by a transfer to the posting status and subsequently the release of the payment and generation of form F15Z for making the payment.

The processing of the invoice is carried out in each case by different persons. This can often result in invoices that have been received on paper being transported between processing steps and, where necessary, being supplemented by other documents that are created in the process. In some cases, the payment process and the posting of payments is carried out with the aid of applications. In contrast, incoming payments are shown by entering the data manually in the accounting system.

Last year, approximately 6,000 entries into the accounts were made at the headquarters. However, these entries not only included invoices received but also business transactions relevant to the accounting process, such as the payment of expenses.

Together, the Federal Ministry of the Interior, the University of Frankfurt and Bonpago have identified the best solution from a wide range of alternatives for exchanging invoices with the public administration,

2490   taking account of cost and sustainability aspects[17.] In order to do this, many national and international
2491   invoice processing solutions were evaluated and surveys conducted among administrations. On this basis,
2492   there is a preference towards a technology-neutral approach, using the ZUGFeRD standard developed by
2493   the Forum for Electronic Invoicing in Germany. These results are now being applied as part of the pilot
2494   project at THW. One key requirement is that suppliers issue invoices to THW which conform to the
2495   ZUGFeRD standard, in read-only and data formats. At the same time, the receipt of invoices should be
2496   kept as flexible as possible, depending on the sellers' wishes. Whether the sellers deliver the data via a
2497   provider, send an e-mail with a PDF file attached or send the data directly in the ZUGFeRD format is not
2498   important. In this way, there is a guarantee that many of the sellers will take part in electronic invoicing.
2499   As far as THW is concerned, it is crucial that accounts processing is performed in a uniform manner.

2500

2501   THW is currently putting the relevant framework conditions in place. The aim is for THW to receive the
2502   first invoices in the ZUGFeRD format by mid-September 2014 and to process these further using web-
2503   based workflow. In this regard, there are three possible options open to the seller:

2504   •   Sending the invoice via a provider participating in the pilot project, who will then supply the in-
2505   voice in the ZUGFeRD format following a specified model

2506   •   Creating the ZUGFeRd-compliant invoice itself and sending it directly to THW

2507   •   Sending a straightforward PDF invoice directly (no image file but instead a PDF document gener-
2508   ated from Word; conversion into a ZUGFeRD-compatible format is carried out at THW) as an in-
2509   terim solution

2510   It is likely that the piloted solution will be able to be used for a large section of public administration. In a
2511   similar way to the THW solution, a sample solution of this kind should include a central ledger for incom-
2512   ing invoices (including archive) as well as an invoice processing workflow. Nowadays, more than 95 per-
2513   cent of administrations do not have a corresponding ledger for incoming invoices. The combination of
2514   receiving invoices electronically, together with a relevant workflow and archive function, means that the
2515   EU's requirement for a rapid introduction of electronic invoicing in the coming years for public administra-
2516   tion will be implemented swiftly. Workflow and archive functions can be set up decentrally at administra-
2517   tions which handle a large volume of invoices, either internally (where the number of invoices received
2518   each year is more than 10,000), or can be offered via a hosted web solution, e.g. in the case of smaller
2519   municipalities.

2520

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[17] See: "Recommended Course of Action for the Implementation of Electronic Invoicing in Public Administrations"; available

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10 Appendix

10.1 Bibliography

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[IS3201]	ISO 32000-1, Document management — Portable document format — Part 1: PDF 1.7, www.iso.ch
[IS1901]	ISO 19005-1: Document management — Electronic document file format for long-term preservation — Part 1: Use of PDF 1.4 (PDF/A-1), www.iso.ch
[IS1902]	ISO 19005-2: Electronic document file format for long-term preservation — Part 2: Use of ISO 32000-1 (PDF/A-2), www.iso.ch
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[AD2004]	XMP Specification, January 2004, Adobe Systems Incorporated. www.aiim.org/documents/standards/xmpspecification.pdf
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The following international standards were used in the development of the ZUGFeRD data model:

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2552	NDR 2.1	UN/CEFACT: XML Naming and Design Rules For CCTS 2.01, Version 2.1, 27 May
2553		2014, http://www1.unece.org/cefact/platform/download/attachments/
2554		53608497/Specification+-+XMLNamingAndDesignRulesV2+1_Final.docx
2555	CWA 16356-1	CEN Workshop Agreement 16356-1, Guide for a European CORE INVOICE data
2556		model with UN/CEFACT CII Implementation Guideline - Part 1: Introduction,
2557		http://www.cen.eu/work/areas/ICT/eBusiness/Documents/CWA_16356-1.pdf
2558	CWA 16356-2	CEN Workshop Agreement 16356-1, Guide for a European CORE INVOICE data
2559		model with UN/CEFACT CII Implementation Guideline - Part 2: European CORE
2560		INVOICE data model, http://www.cen.eu/work/areas/ICT/eBusiness/
2561		Documents/CWA%2016356-2.pdf
2562	CWA 16356-3	CEN Workshop Agreement 16356-1, Guide for a European CORE INVOICE data
2563		model with UN/CEFACT CII Implementation Guideline - Part 3: European
2564		CORE INVOICE syntax mapping, http://www.cen.eu/work/areas/ICT/eBusiness/
2565		Documents/CWA%2016356-3.pdf
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10.2 List of figures

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10.3 List of tables

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10.5 List of abbreviations

2645		
2646	AO	Fiscal Code of Germany (*Abgabenordnung*)
2647 2648	AWV e.V.	Arbeitsgemeinschaft wirtschaftliche Verwaltung e.V. (German Association for Economic Administration)
2649	B2C	Business to Consumer
2650	BIC	Bank Identifier Code
2651	BMI	German Federal Ministry of the Interior
2652	BVA	German Federal Office of Administration
2653	CAD	Computer-Aided Design
2654	CCS	Core Component Specification (ISO 15000-5:2014)
2655	CEN	European Committee for Standardization
2656	i.e.	that is
2657	CCL	Core Component Library
2658	CII	Cross Industry Invoice
2659	CIO	Cross Industry Order
2660	CPV	Common Procurement Vocabulary
2661	CWA	CEN Workshop Agreement
2662	DD	two-digit numeral representing the day, e.g. 25
2663	DIN	German Institute for Standardisation
2664	DMS	Document Management System
2665	EAN	European Article Number, now GTIN
2666	EANCOM	EAN + Communication
2667	EBPP	Electronic Bill Presentment and Payment
2668 2669	eCl@ss	Product data standard for the classification and description of products and services
2670	ECM	Enterprise Content Management
2671	EDI	Electronic Data Interchange
2672 2673	EDIFACT	United Nations rules for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT)
2674	e.g.	for example

2675	ERP	Enterprise Resource Planning
2676	EStG	Income Tax Act (*Einkommensteuergesetz*)
2677	etc.	et cetera
2678	EU COM	EU Commission
2679	EU MSHR EI	European Multi Stakeholder Forum on Electronic Invoicing
2680	FeRD	Forum for Electronic Invoicing in Germany
2681	FTP	File Transfer Protocol
2682 2683	GDPdU	General Principles regarding Data Access and the Verifiability of Digital Records (*Grundsätze zum Datenzugriff und zur Prüfbarkeit digitaler Unterlagen*)
2684 2685	GoBS	Generally Accepted Principles of Computer-assisted Accounting Systems (*Grundsätze ordnungsmäßiger DV-gestützter Buchführungssysteme*)
2686	GPC	Global Product Classification
2687	GS1	GS1 Germany GmbH
2688	GTIN	Global Trade Item Number, formerly EAN
2689	HGB	German Commercial Code (*Handelsgesetzbuch*)
2690	hh	two-digit numeral representing the hour, e.g. 23
2691	IBAN	International Bank Account Number
2692	IDEA	Interactive Data Extraction and Analysis
2693	IPR	Intellectual Property Right
2694	ISO	International Organization for Standardization
2695	IT	information technology
2696	MM	two-digit numeral representing the month, e.g. 06
2697	mm	two-digit numeral representing the minute, e.g. 15
2698	MUG	Message User Guides
2699	NIA-03-03	DIN Working Committee for Electronic Business
2700	OCR	Optical Character Recognition
2701	PDF	Portable Document Format
2702	PDF/A-3	Version 3 of the PDF/A format optimised for long-term archiving
2703	RAL	standardised colour of RAL gGmbH
2704	SDK	Software Development Kit

2705	SEPA	Single Euro Payments Area
2706	SS	two-digit numeral representing the seconds, e.g. 59
2707	THW	Federal Agency for Technical Relief
2708	UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
2709	UNECE	United Nations Economic Commission for Europe
2710	UNSPSC	United Nations Standard Products and Services Code
2711	URN	Uniform Resource Name
2712 2713	UStAE	Value Added Tax Ordinance on the Application of the Value Added Tax Act (*Umsatzsteuer-Anwendungserlass*)
2714	UStG	Value Added Tax Act (*Umsatzsteuergesetz*)
2715	UTF-8	8-Bit Universal Character Set Transformation Format
2716	VAT	value added tax
2717	VAT ID no.	value added tax identification number
2718	WP	FeRD Working Package
2719	WW	two-digit numeral representing the calendar week, e.g.12
2720	XML	Extensible Markup Language
2721	XMP	Extensible Metadata Platform
2722	XSLT	Extensible Stylesheet Language Transformation
2723	YYYY	four-digit numeral representing the year, e.g. 2014
2724	ZUGFeRD	Central User Guide of the Forum for Electronic Invoicing in Germany
2725		

10.6 Enclosures

The enclosures to this document are provided in separate files which can be downloaded at www.zugferd.de. These include in particular:

- The *technical documentation of the ZUGFeRD format* consisting of
  - the semantic ZUGFeRD data model with the associated business terms and
  - the ZUGFeRD schema with the associated business terms.
- ZUGFeRD code lists.

The full ZUGFeRD-Package in German language contains:

- The *technical documentation of the ZUGFeRD format* consisting of
  - the semantic ZUGFeRD data model with the associated business terms and
  - the ZUGFeRD schema with the associated business terms.
- *Technical files* consisting of
  - the ZUGFeRD XML schema
  - the ZUGFeRD Schematron file which can help to make validation possible beyond the XML schema
  - the ZUGFeRD XML style sheets for visualising a ZUGFeRD XML file
  - example invoices in the BASIC, COMFORT and EXTENDED profiles and
  - ZUGFeRD code lists.
- The documentation of the *change history to the current version* from the respective previous version.